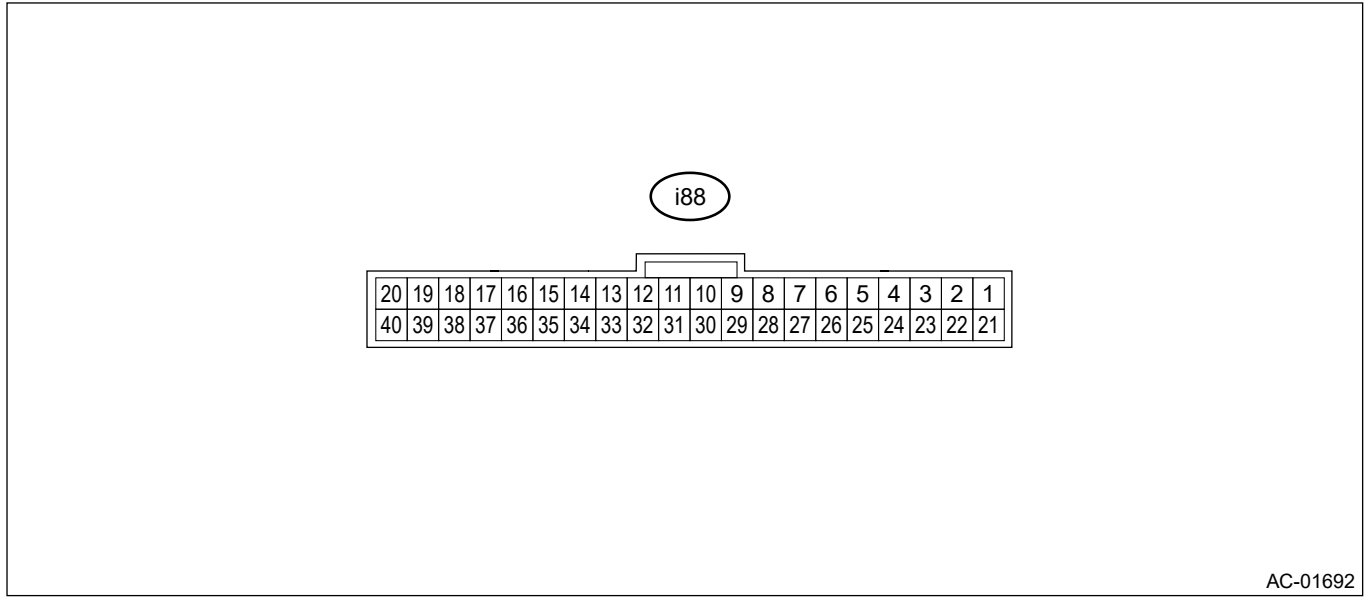


AIR CONDITIONER(DIAGNOSTICS) > Auto A/C Control Module I/O Signal

ELECTRICAL SPECIFICATION



AC-01692

Terminal No.	Description	Measuring condition	Standard
1	Mode door actuator #4	Digital signal; can not be measured	—
2	Mode door actuator #3	Digital signal; can not be measured	—
3	Mode door actuator #2	Digital signal; can not be measured	—
4	Mode door actuator #1	Digital signal; can not be measured	—
6	Intake door actuator (FRESH)	FRESH mode	8 V or more
8	Intake door actuator (RECIRC)	RECIRC mode	8 V or more
9	Blower fan ON signal	Blower fan is ON	1 V or less
10	Intake door potentiometer power supply	Ignition switch ON	5 V
11	A/C cut-off signal	A/C is cut off	1 V or less
12	Intake door potentiometer signal	Ignition switch ON	0 — 5 V
14	GND for sensors	Always	1 V or less
15	ACC power supply	ACC ON	Battery voltage
16	Sunload sensor	Sunlight is contacting sensor	1 — 4 V
17	RECIRC sensor	Ignition switch ON	25°C: 2.5 V

18	Post evaporator sensor	Depends on temperature after the evaporator.	1 — 4.5 V	
19	CAN Lo	Digital signal; can not be measured	—	
20	CAN Hi	Digital signal; can not be measured	—	
21	Air mix door actuator LH #4 *2	Digital signal; can not be measured	—	
22	Air mix door actuator LH #3 *2	Digital signal; can not be measured	—	
23	Air mix door actuator LH #2 *2	Digital signal; can not be measured	—	
24	Air mix door actuator LH #1 *2	Digital signal; can not be measured	—	
25	Air mix door actuator #4 *1 or air mix door actuator RH #4 *2	Digital signal; can not be measured	—	
26	Air mix door actuator #3 *1 or air mix door actuator RH #3 *2	Digital signal; can not be measured	—	
27	Air mix door actuator #2 *1 or air mix door actuator RH #2 *2	Digital signal; can not be measured	—	
28	Air mix door actuator #1 *1 or air mix door actuator RH #1 *2	Digital signal; can not be measured	—	
31	Battery power supply	Always	Battery voltage	
32	IGN	Ignition ON	Battery voltage	
34	GND	Always	1 V or less	
35	ILL-	Illumination ON (measure between 37 — 35)	Battery voltage	
37	ILL+			
40	Fan control signal	Ignition switch: ON, Blower switch: ON	1st	Approx. 9 V
			2nd	Approx. 8 V
			3rd	Approx. 7 V
			4th	Approx. 6 V
			5th	Approx. 5 V
			6th	Approx. 3.5 V
			7th	Approx. 0.5 V

*1: Without left/right independent air conditioning function

*2: With left/right independent air conditioning function

PROCEDURE

Note:

When the sunload sensor check is performed indoors or in the shade, it could be diagnosed as sensor having an open circuit. Always perform the inspection in direct sunlight.

1. START INSPECTIONS.

1. Prepare the tools. [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>General Description>PREPARATION TOOL.](#)
2. Perform the pre-inspection. [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>General Description>INSPECTION.](#)

Is the check result OK?

Yes

Fix the malfunction found in pre-inspection, and go to the next inspection step. [Go to 2.](#)

No

[Go to 2.](#)

2. CHECK DTC.

1. Under the failure condition, leave the vehicle for one minute or more.
2. Read the DTC using Subaru Select Monitor.

Note:

- If the communication function of the Subaru Select Monitor cannot be executed properly, check the communication circuit. [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure for Subaru Select Monitor Communication.](#)
- Record the time stamp and the freeze frame data recorded together with the DTC. For the time stamp, refer to LAN section. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>General Description>CAUTION > TIME STAMP.](#)

Are any DTCs displayed?

Yes

Perform the diagnosis for the displayed DTCs. [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Refer to Diagnostics with Phenomenon. [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostics with Phenomenon.](#)

AIR CONDITIONER(DIAGNOSTICS) > Clear memory

OPERATION

- 1.** On [Start] display, select [Diagnosis].
- 2.** On [Vehicle selection] display, input the target vehicle information and select [OK].
- 3.** On [Main Menu] display, select [Each System].
- 4.** On [Select System] display, select [Air Conditioner], and then select [Enter].
- 5.** On [Select Function] display, select [DTC].
- 6.** On [DTC] display, select [Clear memory].

Note:

For detailed operation procedures, refer to “Application help”.

AIR CONDITIONER(DIAGNOSTICS) > Data Monitor

LIST

Items to be displayed	Unit of measure	Description	Note
In-vehicle Sensor Temperature	°C (°F)	A/C control panel input value	—
Quantity of Sunload	W/m ²	A/C control panel input value	—
A/C Pressure Switch	OK / NG	A/C control panel input value	—
Heater Water Temperature	°C (°F)	Data value received by CAN	—
Heater Control Panel Setting Value (Driver's)	LO: 18°C (60°F) HI: 32°C (90°F)	Control panel display value	—
Heater Control Panel Setting Value (Passenger's)	LO: 18°C (60°F) HI: 32°C (90°F)	Control panel display value	For models with left/right independent air conditioning function only
Blower outlet request temperature (Driver's)	°C (°F)	A/C control panel internal setting value	For models with left/right independent air conditioning function only
Blower outlet request temperature (Passenger's)	°C (°F)	A/C control panel internal setting value	For models with left/right independent air conditioning function only
Air mix door actuator position (driver's side)	%	A/C control panel input value	—
Air mix door actuator position (passenger's side)	%	A/C control panel input value	For models with left/right independent air conditioning function only
Mode Door Actuator Position	%	A/C control panel input value	—
Fresh/Recircle Air Door Actuator Position	%	A/C control panel input value	—
Target air mix door actuator position (driver's side)	%	A/C control panel input value	—
Target air mix door actuator position	%	A/C control panel	—

(passenger's side)		input value	
Mode Door Actuator Position Target	%	A/C control panel input value	—
Fresh/Recircle Air Door Actuator Position Target	%	A/C control panel input value	—
Blower Fan Level	Level	A/C control panel internal output value	—
Ambient Air Temperature	°C (°F)	Data value received by CAN	—
Compressor operation status	OFF / AUTO	A/C control panel input value	—
Blower Fan Operating Condition	MANU/AUTO	A/C control panel input value	—
A/C Operating Condition	MANU/AUTO	A/C control panel input value	—
Fresh/Recircle Air Operating Condition	MANU/AUTO	A/C control panel input value	—
Mode Operating Condition	MANU/AUTO	A/C control panel input value	—
Rear Defogger	ON/OFF	A/C control panel input value	—
Engine Speed	rpm	Data value received by CAN	—
Vehicle Speed Sensor	km/h	Data value received by CAN	—
Evaporator Temperature	°C (°F)	A/C control panel input value	—
Evaporator Temperature Target	°C (°F)	A/C control panel input value	—
Blower outlet Door Request Temperature	°C (°F)	A/C control panel internal setting value	—
PTC permitted number	0 – 3	A/C control panel input value	Not supported
PTC operation steps	0 – 3	A/C control panel input value	Not supported
PTC Heater 3	Inoperative / Operative	A/C control panel input value	Not supported
PTC Heater 2	Inoperative / Operative	A/C control panel input value	Not supported
PTC Heater 1	Inoperative / Operative	A/C control panel input value	Not supported

Request engine speed	0: No request 1: Cooling H 2: Heating H 3: Cooling L 4: Heating L	A/C control panel internal output value	—
Heater core Temp.	°C (°F)	A/C control panel input value	Not supported

AIR CONDITIONER(DIAGNOSTICS) > Data Monitor

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Select Vehicle] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Air Conditioner], and then select [Next].
5. On [Select Function] display, select [Data Monitor].

Note:

For detailed operation procedures, refer to “Application help”.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

COMMUNICATION FOR INITIALIZING IMPOSSIBLE

Diagnosis:

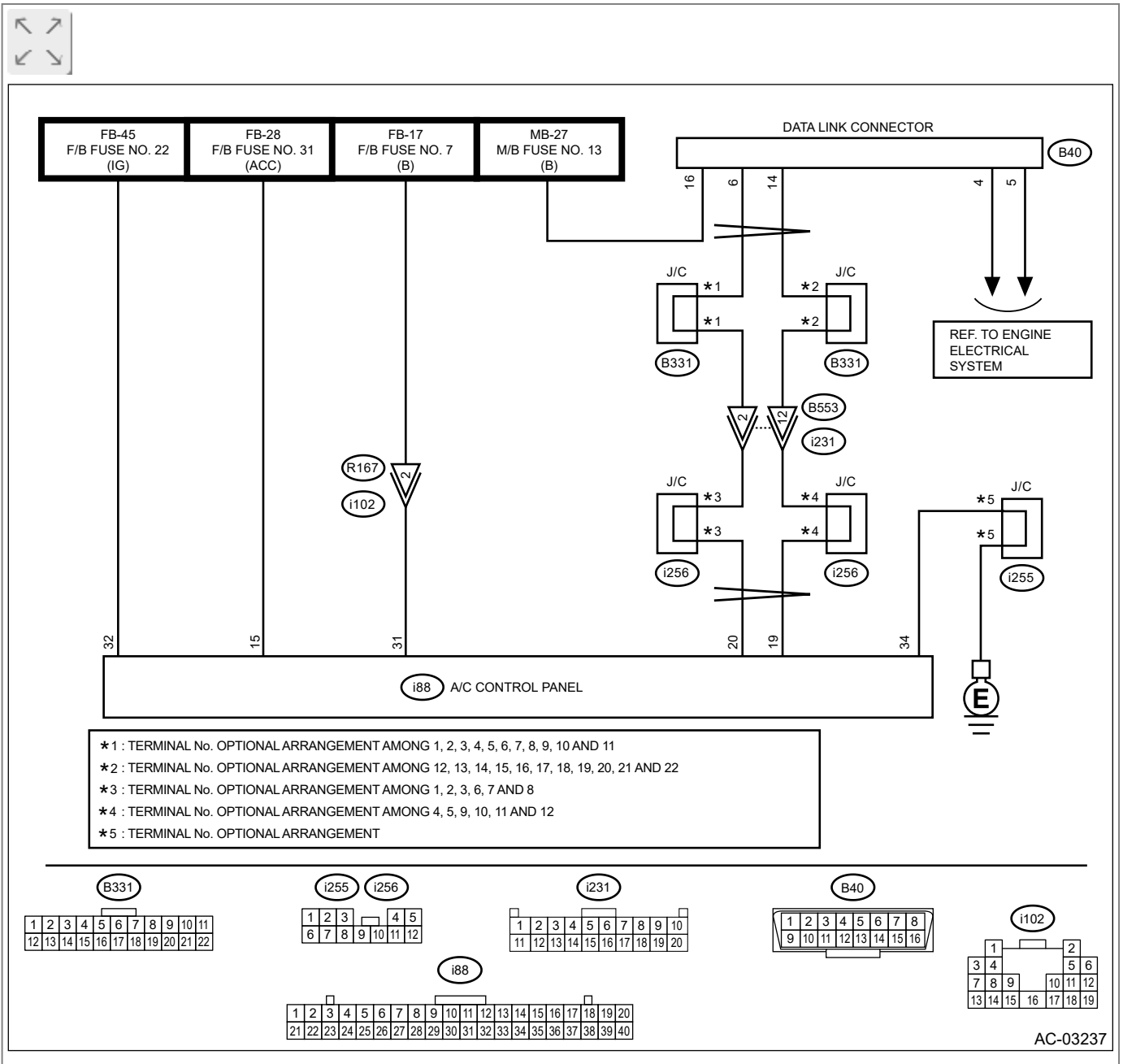
Defective CAN communication circuit

Trouble symptom:

- LAN system is abnormal.
- Communication failure between Subaru Select Monitor and A/C control panel

Wiring diagram:

Air conditioning system  [Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.](#)



1. CHECK POWER SUPPLY CIRCUIT.



Connect DST-i to data link connector.

Does DST-i turn ON?

Yes

 [Go to 4.](#)

No

 [Go to 2.](#)

2. CHECK POWER SUPPLY CIRCUIT.



Measure the voltage between data link connector and chassis ground.

Connector & terminal

(B40) No. 16 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 3.](#)

No

Repair the power supply circuit.

Note:

In this case, repair the following item:

- **Open or ground short circuit of harness between battery and data link connector**
- **Blown out of fuse (M/B No. 12)**

3. CHECK HARNESS BETWEEN DATA LINK CONNECTOR AND CHASSIS GROUND (OPEN).



1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between data link connector and chassis ground.

Connector & terminal

(B40) No. 4 — Chassis ground:

(B40) No. 5 — Chassis ground:


Is the resistance less than 5 Ω ?

Yes

Repair the poor contact of data link connector.

No

Check for poor contact of the data link connector, and repair a fault, if any.

When no fault is found,  [Go to 5.](#)

4. CHECK SUBARU SELECT MONITOR.


1. Connect the Subaru Select Monitor to a normal vehicle.
2. Start the engine and perform communication between the Subaru Select Monitor and vehicle.

Is communication possible?

 [Go to 5.](#)

Use another Subaru Select Monitor because the CAN communication circuit of the Subaru Select Monitor is faulty.

5. CHECK LAN SYSTEM.

Check the LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

Is the check result OK?

 [Go to 6.](#)

Repair it according to the diagnosis for LAN system.

6. CHECK CONNECTOR.

Check for poor contact of power supply circuit connector.

Is the check result OK?

 [Go to 7.](#)

Repair the connector.


7. CHECK FUSE.

1. Turn the ignition switch to OFF.

2. Remove a fuse from the fuse box.
3. Check the fuse.

Is the check result OK?

Yes

 [Go to 8.](#)

No

Replace the fuse. If the replaced fuse blows out easily, repair the ground short circuit in harness between the A/C control panel and fuse.

8. CHECK A/C CONTROL PANEL POWER SUPPLY CIRCUIT (OPEN).




1. Disconnect the A/C control panel connector.
2. Measure the voltage between A/C control panel connector terminal and chassis ground after turning the ignition switch to ON.

Connector & terminal

- (i88) No. 15 (+) — Chassis ground (-):
- (i88) No. 31 (+) — Chassis ground (-):
- (i88) No. 32 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 9.](#)

No

Check for open or short circuit in the harness between A/C control panel and fuse.

9. CHECK A/C CONTROL PANEL GROUND CIRCUIT (OPEN).



Measure the resistance of harness between A/C control panel and chassis ground.

Connector & terminal

- (i88) No. 34 — Chassis ground:

Is the resistance less than 5 Ω ?

Yes

Recheck the poor contact between the data link connector and select monitor.

No

Repair the harness for ground line.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1430 IN-VEHICLE (POST EVAPORATOR) TEMPERATURE SENSOR CIRCUIT OPEN

DTC detecting condition:

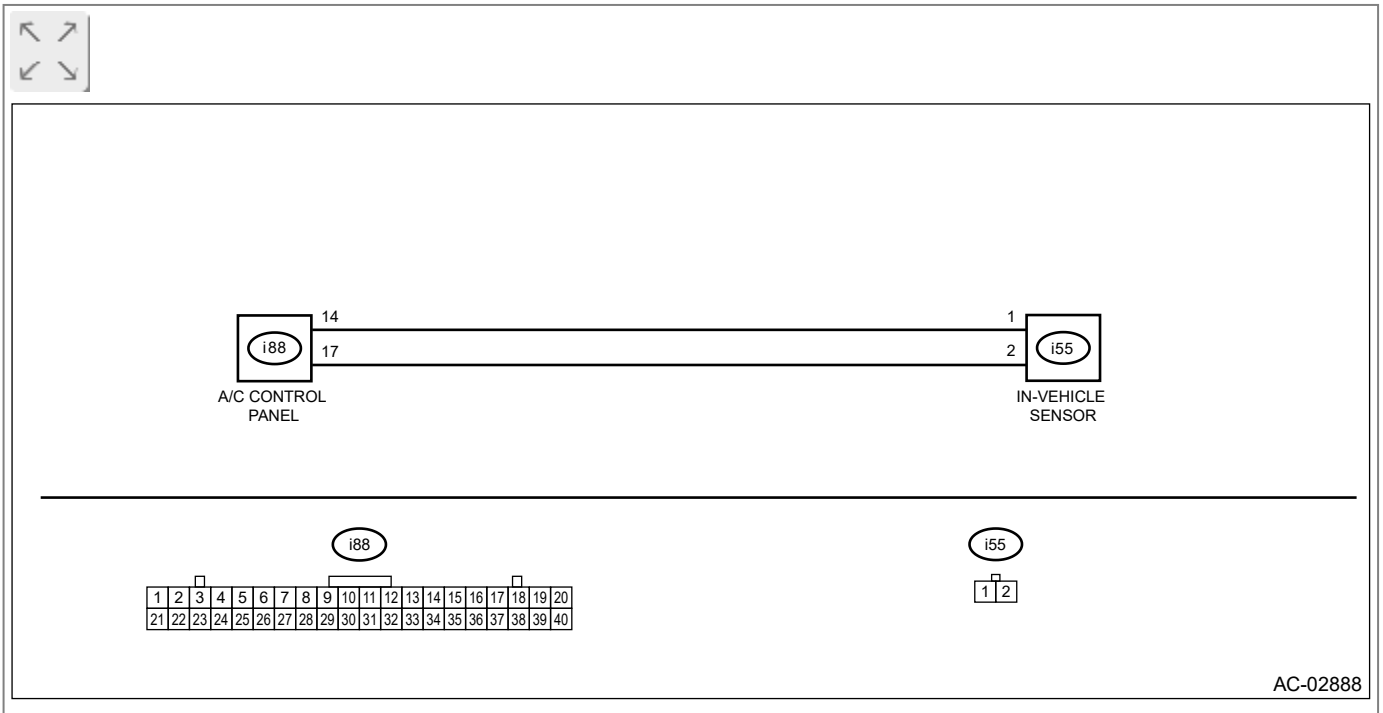
In-vehicle sensor circuit is open.

Trouble symptom:


In-vehicle air temperature is falsely recognized as 25°C (77°F), and the compartment temperature is adjusted.

Wiring diagram:

Air conditioning system  [Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.](#)




1. CHECK CONNECTOR.

1. Check the condition of connector connection.
2. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1430 displayed?

Yes

 [Go to 2.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK IN-VEHICLE SENSOR.



1. Disconnect the in-vehicle sensor.
2. Short the connector.
3. Read the DTC using Subaru Select Monitor. [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1431 displayed?

Yes

Replace the in-vehicle sensor. [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>In-Vehicle Sensor \(Auto A/C Model\)>REMOVAL.](#)

No

[Go to 3.](#)

3. CHECK HARNESS.



1. Restore the temporary shorted lines made in step 2.
2. Turn the ignition switch to ON.
3. Using the tester, measure the voltage between terminals.

Connector & terminal

(i55) No. 2 (+) — No. 1 (-):

Is the voltage 4.5 — 5.0 V?

Yes

[Go to 4.](#)

No

Repair or replace the open circuit of harness.

4. CHECK HARNESS (OPEN CIRCUIT).



1. Disconnect the connector from the A/C control panel.
2. Using a tester, check continuity between terminals.

Connector & terminal

(i55) No. 1 — (i88) No. 14:

(i55) No. 2 — (i88) No. 17:

Is there continuity?

Yes

Replace the A/C control panel. [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

No

Repair or replace the open circuit of harness.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1431 IN-VEHICLE (POST EVAPORATOR) TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT

DTC detecting condition:

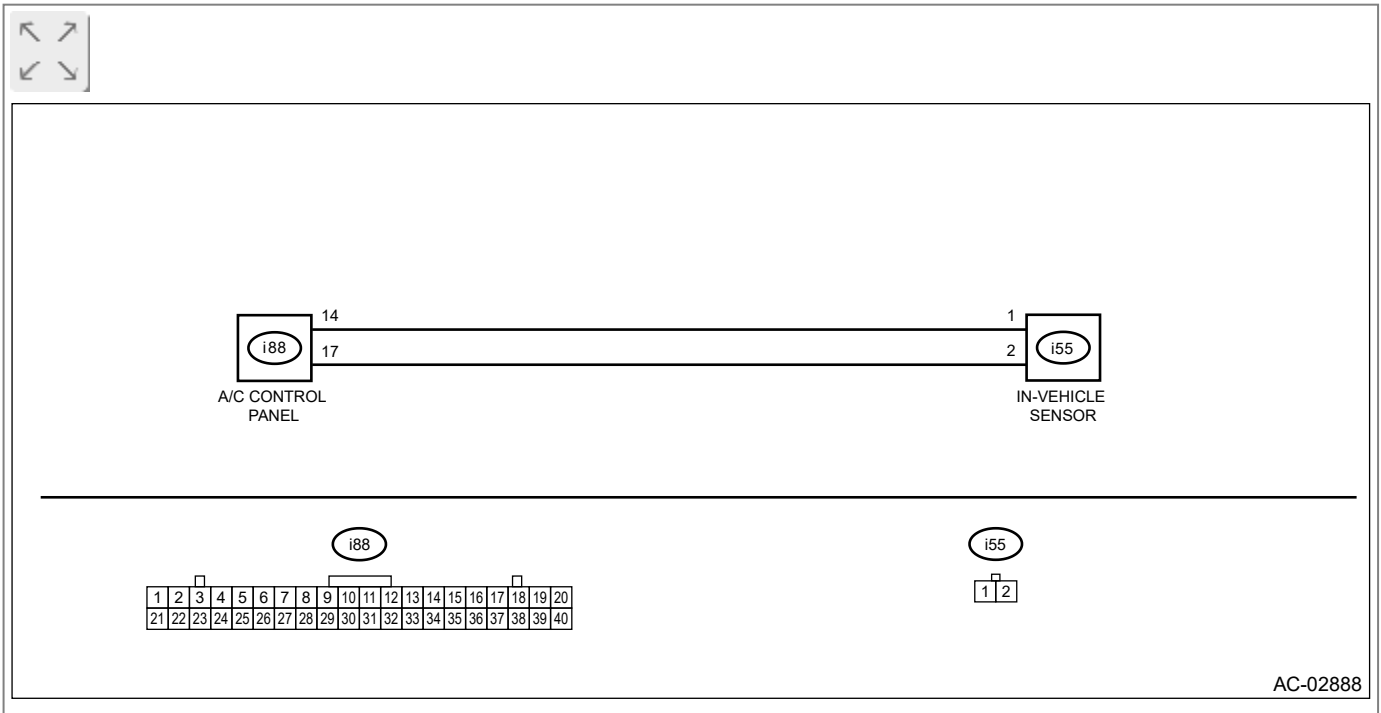
In-vehicle sensor circuit is shorted.

Trouble symptom:


In-vehicle air temperature is falsely recognized as 25°C (77°F), and the compartment temperature is adjusted.

Wiring diagram:

Air conditioning system  [Ref. to WIRING SYSTEM>Air Conditioning_System>WIRING DIAGRAM.](#)



1. CHECK CONNECTOR.

1. Check the condition of connector connection.
2. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1431 displayed?



 [Go to 2.](#)

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:


In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK IN-VEHICLE SENSOR.

1. Disconnect the in-vehicle sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>In-Vehicle Sensor \(Auto A/C Model\)>REMOVAL.](#)
2. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1430 displayed?

Yes

Replace the in-vehicle sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>In-Vehicle Sensor \(Auto A/C Model\)>REMOVAL.](#)

No

 [Go to 3.](#)

3. CHECK HARNESS.

1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between terminals.

Connector & terminal

(i55) No. 2 (+) — No. 1 (-):

Is the voltage 4.5 — 5.0 V?

Yes

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

- **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

No

 [Go to 4.](#)

4. CHECK HARNESS (SHORTED BETWEEN LINES).

1. Disconnect the connector from the A/C control panel.
2. Using a tester, check continuity between terminals.

Connector & terminal

(i55) No. 1 — No. 2:

Is there continuity?

Yes

Repair or replace the short circuit of the harness.

No

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1432 AMBIENT TEMPERATURE SENSOR CIRCUIT OPEN (AIR-CONDITIONER)

DTC detecting condition:

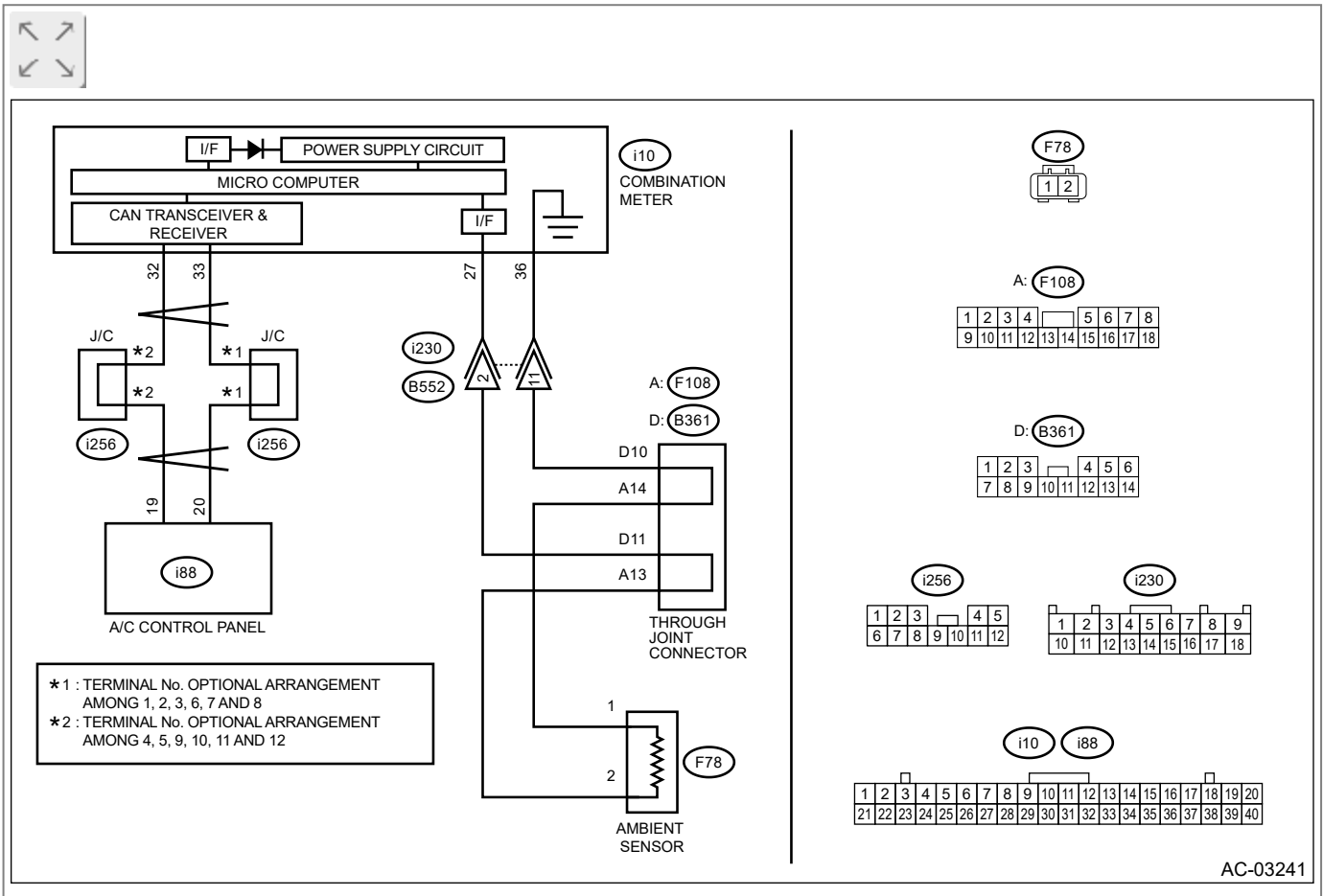
Ambient sensor circuit is open.

Trouble symptom:


Ambient temperature is falsely recognized, and the compartment temperature is adjusted.

Wiring diagram:

Air conditioning system  [Ref. to WIRING SYSTEM>Air Conditioning_System>WIRING DIAGRAM.](#)



1. CHECK CONNECTOR.

1. Check the connecting conditions of combination meter connector and ambient sensor connector.
2. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1432 displayed?

 [Go to 2.](#)


No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:


In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK AMBIENT SENSOR.

1. Disconnect the in-vehicle sensor.
2. Short the connector F78.
3. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1433 displayed?

Yes

Replace the ambient sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Ambient Sensor.](#)

No

 [Go to 3.](#)

3. CHECK HARNESS.

1. Restore the temporary shorted lines made in step 2.
2. Turn the ignition switch to ON.
3. Using the tester, measure the voltage between terminals.

Connector & terminal

(F78) No. 1 (+) — No. 2 (-):

Is the voltage 4.5 — 5.0 V?

Yes

 [Go to 4.](#)

No

Repair or replace the open circuit of harness.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the connector from the A/C control panel.
2. Using a tester, check continuity between terminals.


Connector & terminal

(F78) No. 2 — (i10) No. 36:

(F78) No. 1 — (i10) No. 27:

Is there continuity?

Yes

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

No

Repair or replace the open circuit of harness.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1433 AMBIENT TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT (AIR-CONDITIONER)

DTC detecting condition:

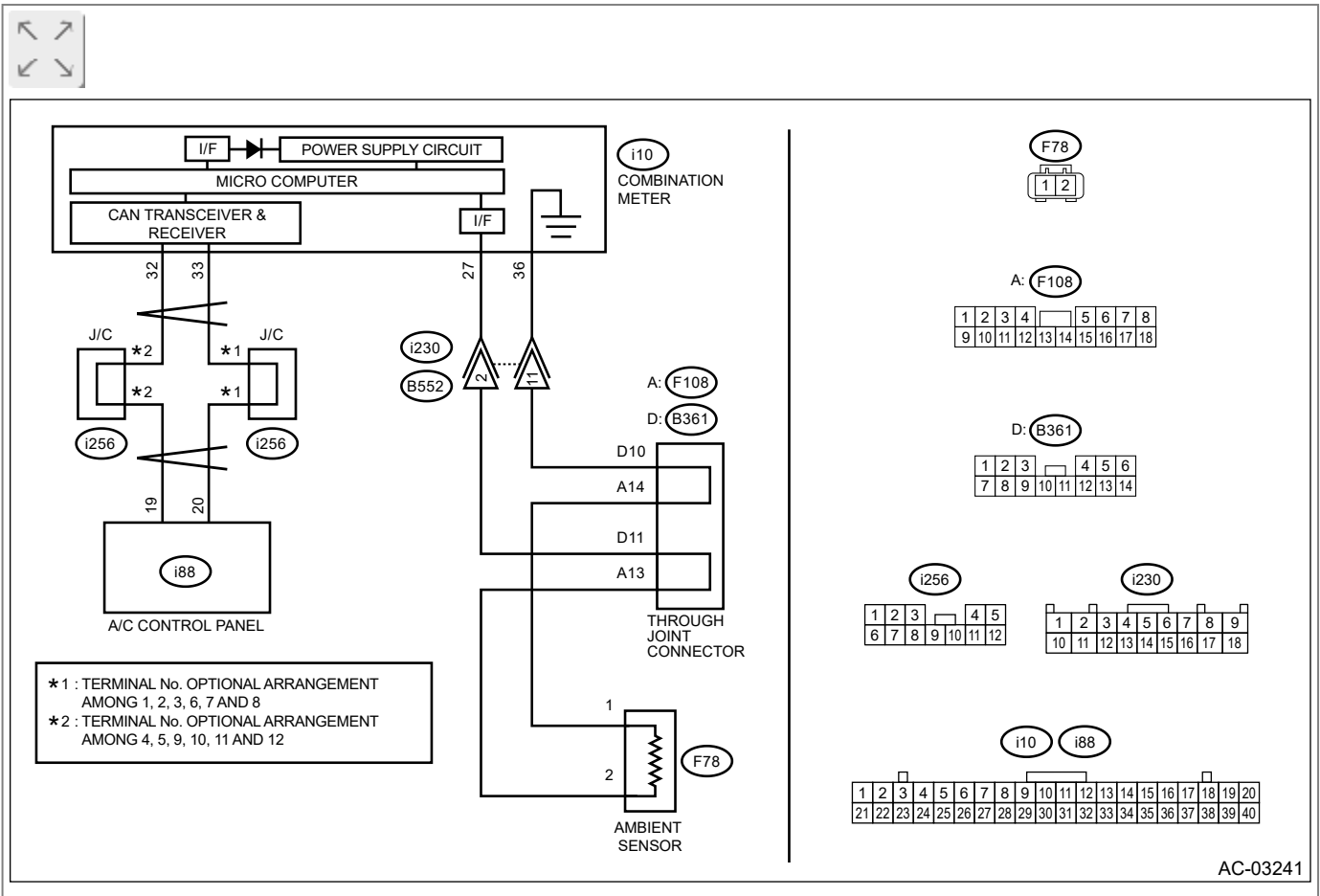
Ambient sensor circuit is shorted.

Trouble symptom:


Ambient temperature is falsely recognized, and the compartment temperature is adjusted.

Wiring diagram:

Air conditioning system  [Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.](#)




1. CHECK CONNECTOR.

1. Check the connecting conditions of combination meter connector and ambient sensor connector.
2. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1433 displayed?

Yes

 [Go to 2.](#)



No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:


In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK AMBIENT SENSOR.

1. Disconnect the ambient sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Ambient Sensor.](#)
2. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1432 displayed?

Yes

Replace the ambient sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Ambient Sensor.](#)

No

 [Go to 3.](#)

3. CHECK HARNESS.

1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between terminals.

Connector & terminal

(F78) No. 1 (+) — No. 2 (-):

Is the voltage 4.5 — 5.0 V?

Yes

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

- **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

No

 [Go to 4.](#)

4. CHECK HARNESS (SHORTED BETWEEN LINES).

1. Disconnect the connector from the combination meter.
2. Using a tester, check continuity between terminals.

Connector & terminal


(F78) No. 1 — No. 2:

Is there continuity?

Yes

Repair or replace the short circuit of the harness.

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1434 EVAPORATOR TEMPERATURE SENSOR CIRCUIT OPEN

DTC detecting condition:

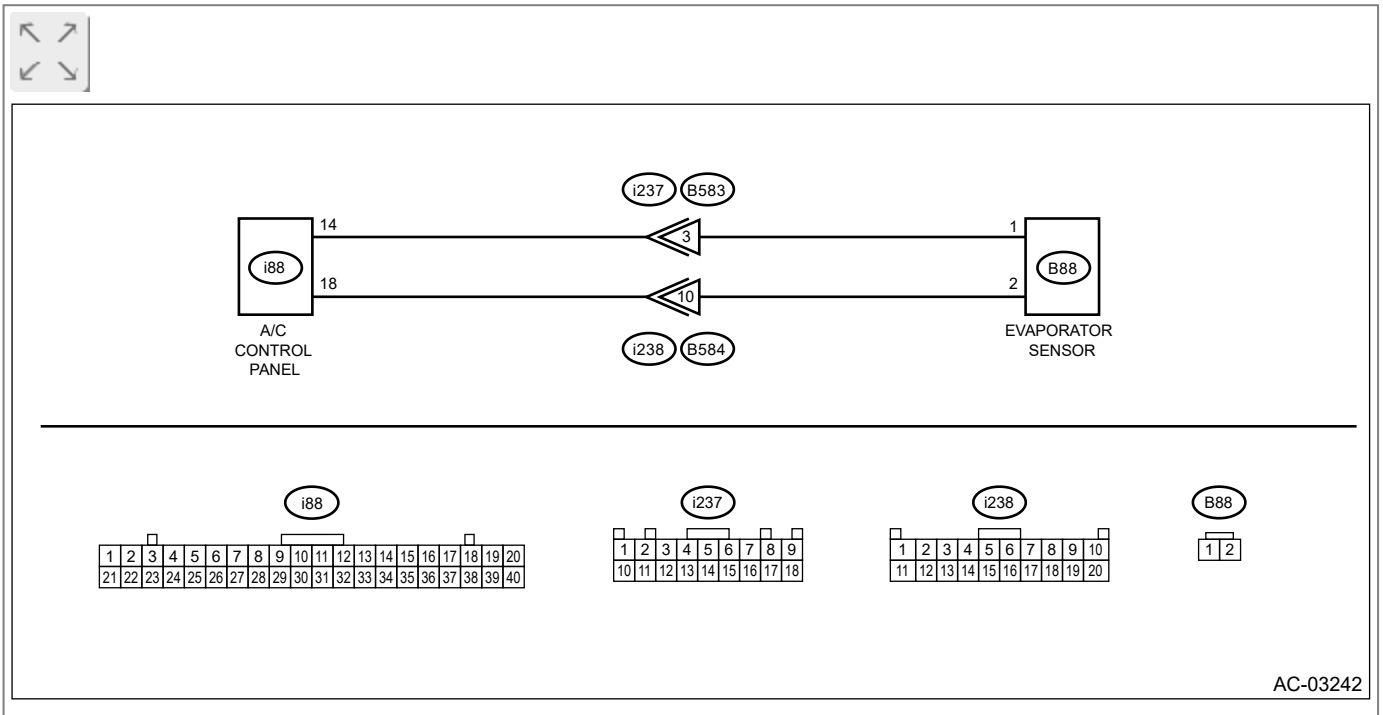
Evaporator sensor circuit is open.

Trouble symptom:


Evaporator temperature is falsely recognized as low, and the compartment temperature is adjusted.

Wiring diagram:

Air conditioning system  [Ref. to WIRING SYSTEM>Air Conditioning_System>WIRING DIAGRAM.](#)



1. CHECK CONNECTOR.

1. Check the condition of connector connection.
2. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1434 displayed?

Yes

 [Go to 2.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK EVAPORATOR SENSOR.



1. Disconnect the evaporator sensor.
2. Short the evaporator sensor connector (B88).
3. Read the DTC using Subaru Select Monitor. [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1435 displayed?

Yes

Replace the evaporator sensor. [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Evaporator>REMOVAL.](#)

No

[Go to 3.](#)

3. CHECK HARNESS.



1. Restore the temporary shorted lines made in step 2.
2. Turn the ignition switch to ON.
3. Using the tester, measure the voltage between terminals.

Connector & terminal

(B88) No. 2 (+) — No. 1 (-):

Is the voltage 4.5 — 5.0 V?

Yes

[Go to 4.](#)

No

Repair or replace the open circuit of harness.

4. CHECK HARNESS (OPEN CIRCUIT).



1. Disconnect the connector from the A/C control panel.
2. Using a tester, check continuity between terminals.

Connector & terminal

(B88) No. 1 — (i88) No. 14:

(B88) No. 2 — (i88) No. 18:

Is there continuity?

Yes

Replace the A/C control panel. [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

No

Repair or replace the open circuit of harness.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1435 EVAPORATOR TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT

DTC detecting condition:

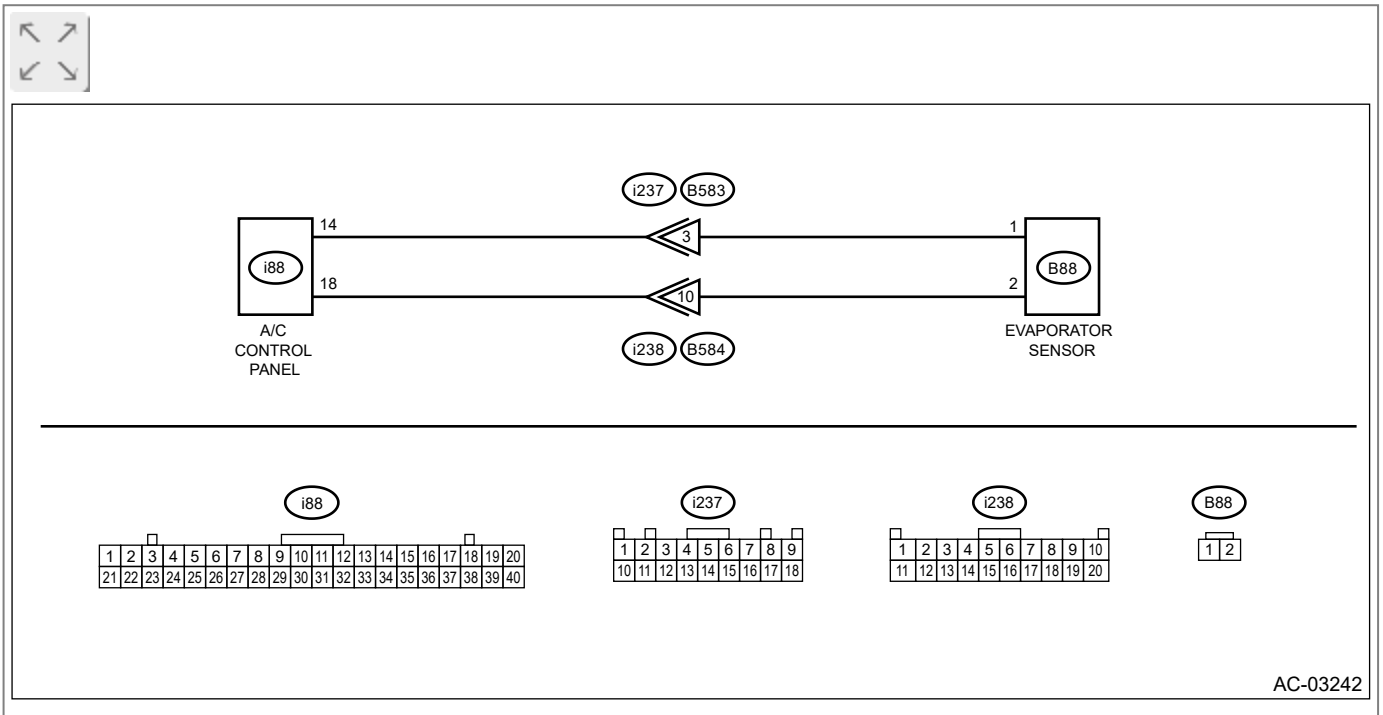
Evaporator sensor circuit is shorted.

Trouble symptom:


Evaporator temperature is falsely recognized as high, and the compartment temperature is adjusted.

Wiring diagram:

Air conditioning system  [Ref. to WIRING SYSTEM>Air Conditioning_System>WIRING DIAGRAM.](#)



1. CHECK CONNECTOR.

1. Check the condition of connector connection.
2. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1435 displayed?

Yes

 [Go to 2.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK EVAPORATOR SENSOR.



1. Disconnect the evaporator sensor.
2. Read the DTC using Subaru Select Monitor. [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1434 displayed?

Yes

Replace the evaporator sensor. [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Evaporator>REMOVAL.](#)

No

[Go to 3.](#)

3. CHECK HARNESS.



1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between terminals.

Connector & terminal

(B88) No. 2 (+) — No. 1 (-):

Is the voltage 4.5 — 5.0 V?

Yes

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

[Go to 4.](#)

4. CHECK HARNESS (SHORTED BETWEEN LINES).



1. Disconnect the connector from the A/C control panel.
2. Using a tester, check continuity between terminals.

Connector & terminal


(B88) No. 1 — No. 2:

Is there continuity?

Yes

Repair or replace the short circuit of the harness.

No

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B14A1 SUNLOAD SENSOR CIRCUIT LOW/OPEN

DTC detecting condition:

Sunload sensor circuit is open. (Displayed for current malfunction)

Note:

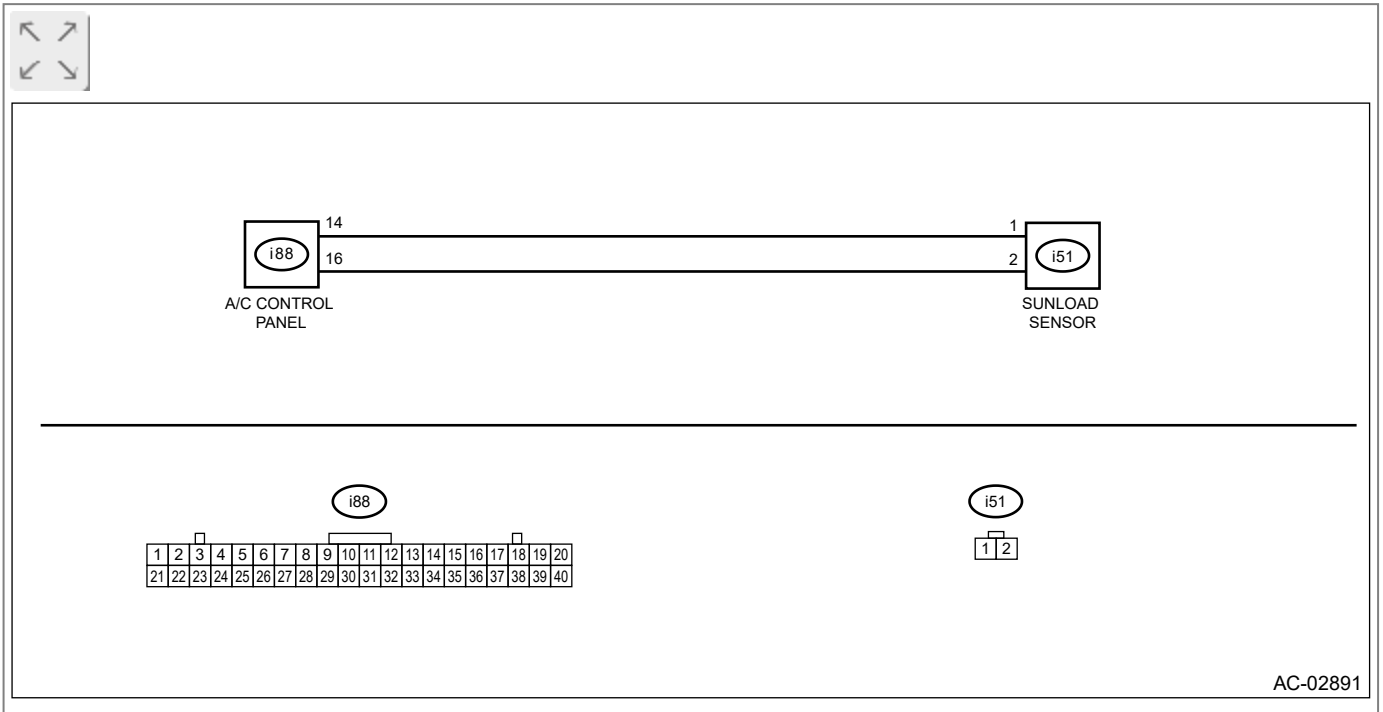
When the sunload sensor check is performed indoors or in the shade, it could be diagnosed as having an open circuit. Always check the sunload sensor in direct sunlight.

Trouble symptom:


Operation is performed as no sunload.

Wiring diagram:

Air conditioning system  [Ref. to WIRING SYSTEM>Air Conditioning_System>WIRING DIAGRAM.](#)




1. CHECK CONNECTOR.

1. Check the condition of connector connection.
2. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14A1 displayed?

Yes

 [Go to 2.](#)


No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:


In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK SUNLOAD SENSOR.

1. Disconnect the sunload sensor.
2. Short the connector.
3. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14A2 displayed?

Yes

Replace the sunload sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Sunload Sensor \(Auto A/C Model\)>REMOVAL.](#)

No

 [Go to 3.](#)

3. CHECK HARNESS.

1. Restore the temporary shorted lines made in step 2.
2. Turn the ignition switch to ON.
3. Using the tester, measure the voltage between terminals.

Connector & terminal

(i51) No. 2 (+) — No. 1 (-):

Is the voltage 4.5 — 5.0 V?

Yes

 [Go to 4.](#)

No

Repair or replace the open circuit of the harness.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the connector from the A/C control panel.
2. Using a tester, check continuity between terminals.

Connector & terminal

(i51) No. 1 — (i88) No. 14:

(i51) No. 1 — (i88) No. 16:

Is there continuity?

Yes

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

No

Repair or replace the open circuit of harness.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B14A2 SUNLOAD SENSOR CIRCUIT SHORT-CIRCUIT

DTC detecting condition:

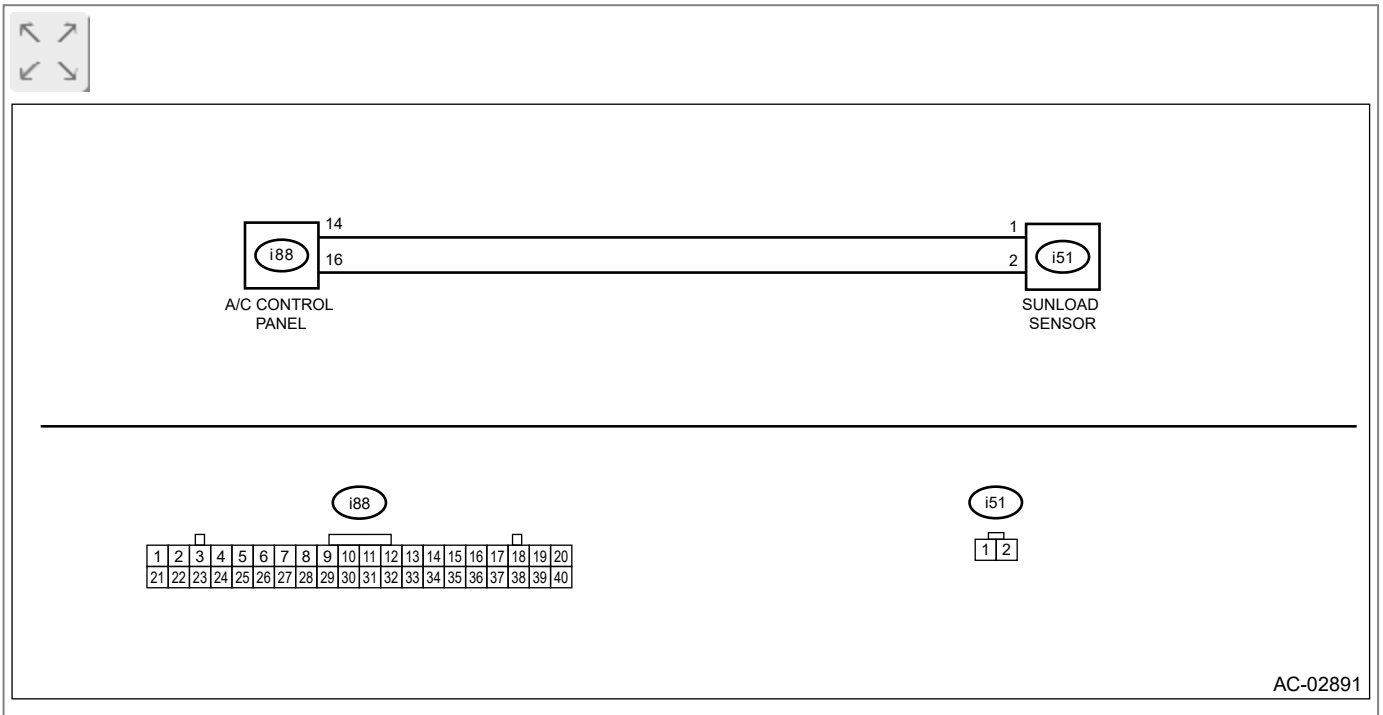
Sunload sensor circuit is shorted.

Trouble symptom:


Operation is performed as no sunload.

Wiring diagram:

Air conditioning system  [Ref. to WIRING SYSTEM>Air Conditioning_System>WIRING DIAGRAM.](#)




1. CHECK CONNECTOR.

1. Check the condition of connector connection.
2. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14A2 displayed?

Yes

 [Go to 2.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK SUNLOAD SENSOR.



1. Disconnect the sunload sensor.
2. Read the DTC using Subaru Select Monitor. [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14A1 displayed?

Yes

Replace the sunload sensor. [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Sunload Sensor \(Auto A/C Model\)>REMOVAL.](#)

No

[Go to 3.](#)

3. CHECK HARNESS.



1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between terminals.

Connector & terminal

(i51) No. 2 (+) — No. 1 (-):

Is the voltage 4.5 — 5.0 V?

Yes

Check the connection of the sunload sensor circuit.

No

[Go to 4.](#)

4. CHECK HARNESS (SHORTED BETWEEN LINES).



1. Disconnect the connector from the A/C control panel.
2. Using a tester, check continuity between terminals.

Connector & terminal

(i51) No. 1 — No. 2:

Is there continuity?

Yes

Repair or replace the short circuit of the harness.

No

Replace the A/C control panel. [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B14E1 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN (DRIVER)

DTC detecting condition:

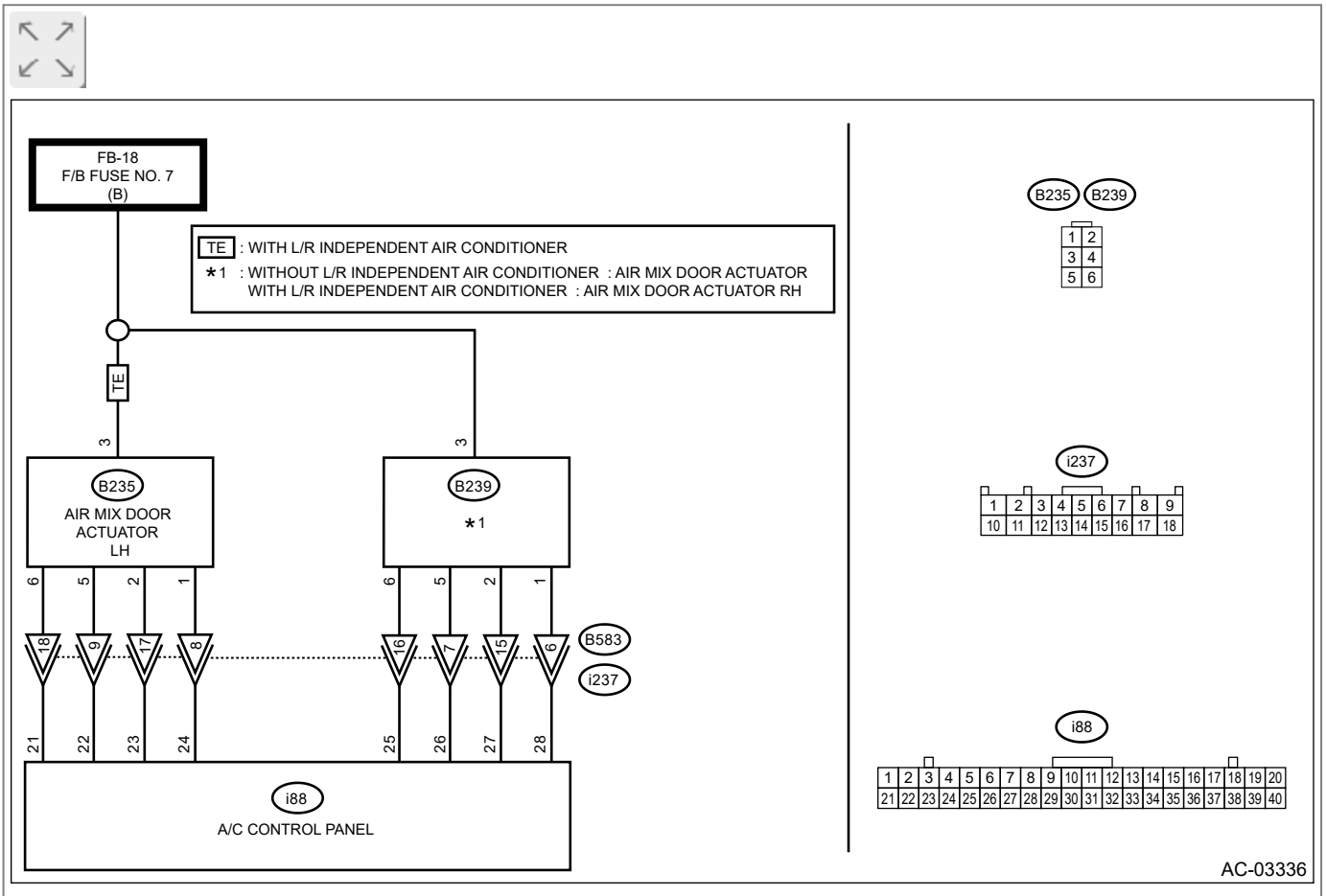
Air mix door actuator stepping motor circuit is open.

Trouble symptom:


Temperature cannot be adjusted.

Wiring diagram:


Air conditioning system  [Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.](#)



1. CHECK CONNECTOR.

1. Check the condition of connector connection.
2. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14E1 displayed?

 [Go to 2.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK POWER SUPPLY OF AIR MIX DOOR ACTUATOR.

1. Turn the ignition switch to OFF.
2. Disconnect the air mix door actuator connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between the air mix door actuator connector terminal and chassis ground.

Connector & terminal

Without left/right independent air conditioning function


(B239) No. 3 (+) — Chassis ground (-):

With left/right independent air conditioning function

(B235) No. 3 (+) — Chassis ground (-):

Is the voltage approx. 10 V or more?

Yes

 [Go to 3.](#)

No

Check the DC power supply circuit.

3. CHECK AIR MIX DOOR ACTUATOR.

1. Turn the ignition switch to OFF.
2. Measure the internal resistance of the air mix door actuator using a tester.

Terminals

Without left/right independent air conditioning function (air mix door actuator)

No. 3 — No. 1:

No. 3 — No. 2:

No. 3 — No. 5:

No. 3 — No. 6:

With left/right independent air conditioning function (air mix door actuator LH)

No. 3 — No. 1:


No. 3 — No. 2:

No. 3 — No. 5:


No. 3 — No. 6:

Is the resistance 80 — 100 Ω?

Yes

 [Go to 4.](#)

No

Replace the actuator.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Air Mix Door Actuator>REMOVAL.](#)

4. CHECK HARNESS BETWEEN A/C CONTROL PANEL AND AIR MIX DOOR ACTUATOR (OPEN).

1. Disconnect the A/C control panel connector.
2. Measure the resistance between A/C control panel and air mix door actuator connector.

Connector & terminal

Without left/right independent air conditioning function

(B239) No. 1 — (i88) No. 28:

(B239) No. 2 — (i88) No. 27:

(B239) No. 5 — (i88) No. 26:

(B239) No. 6 — (i88) No. 25:

With left/right independent air conditioning function

(B235) No. 1 — (i88) No. 24:

(B235) No. 2 — (i88) No. 23:

(B235) No. 5 — (i88) No. 22:

(B235) No. 6 — (i88) No. 21:

Is there continuity?

Yes

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

No

Repair or replace the open circuit of harness.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B14E2 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT (DRIVER)

DTC detecting condition:

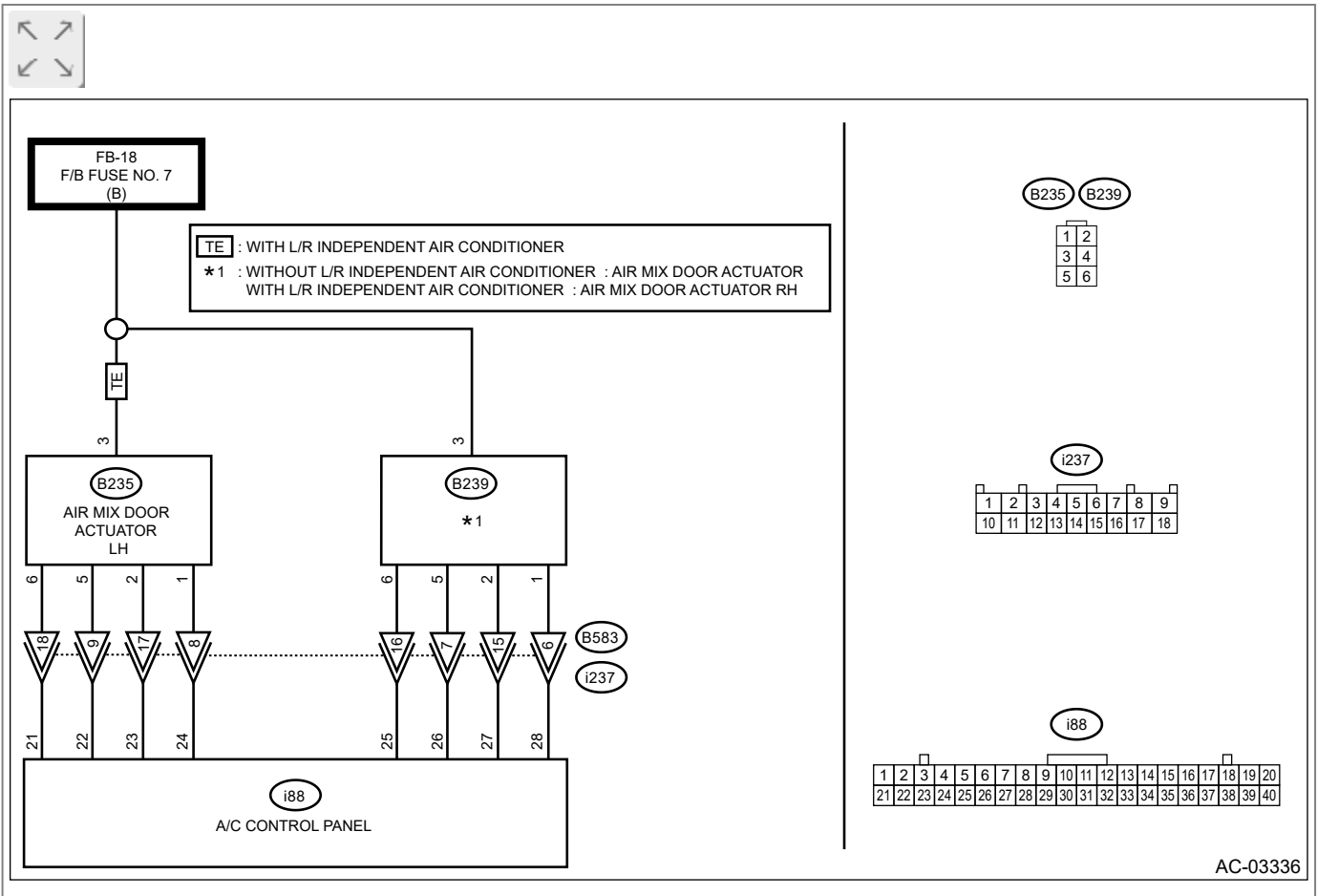
Air mix door actuator stepping motor circuit is shorted.

Trouble symptom:


Temperature cannot be adjusted.

Wiring diagram:

Air conditioning system  [Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.](#)



1. CHECK CONNECTOR.

1. Check the condition of connector connection.
2. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14E2 displayed?

Yes

 [Go to 2.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK POWER SUPPLY OF AIR MIX DOOR ACTUATOR.



1. Turn the ignition switch to OFF.
2. Disconnect the air mix door actuator connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between the air mix door actuator connector terminal and chassis ground.

Connector & terminal

Without left/right independent air conditioning function


(B239) No. 3 (+) — Chassis ground (-):

With left/right independent air conditioning function

(B235) No. 3 (+) — Chassis ground (-):

Is the voltage approx. 10 V or more?

Yes

 [Go to 3.](#)

No

Check the DC power supply circuit.

3. CHECK AIR MIX DOOR ACTUATOR.



1. Turn the ignition switch to OFF.
2. Measure the internal resistance of the air mix door actuator using a tester.

Terminals

Without left/right independent air conditioning function (air mix door actuator)

No. 3 — No. 1:

No. 3 — No. 2:

No. 3 — No. 5:

No. 3 — No. 6:

With left/right independent air conditioning function (air mix door actuator LH)

No. 3 — No. 1:

No. 3 — No. 2:

No. 3 — No. 5:


No. 3 — No. 6:

Is the resistance 80 — 100 Ω?

Yes

 [Go to 4.](#)

No

Replace the actuator.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Air Mix Door Actuator>REMOVAL.](#)

4. CHECK HARNESS BETWEEN A/C CONTROL PANEL AND AIR MIX DOOR ACTUATOR (SHORTED TO POWER SUPPLY).

1. Disconnect the A/C control panel connector.
2. Measure the voltage between air mix door actuator connector and chassis ground.

Connector & terminal

Without left/right independent air conditioning function

(B239) No. 1 (+) — Chassis ground (-):

(B239) No. 2 (+) — Chassis ground (-):

(B239) No. 5 (+) — Chassis ground (-):

(B239) No. 6 (+) — Chassis ground (-):

With left/right independent air conditioning function

(B235) No. 1 (+) — Chassis ground (-):

(B235) No. 2 (+) — Chassis ground (-):

(B235) No. 5 (+) — Chassis ground (-):

(B235) No. 6 (+) — Chassis ground (-):

Is there any voltage?

Yes

Repair or replace the short circuit of the harness.

No

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B14E3 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN (PASSENGER)

DTC detecting condition:

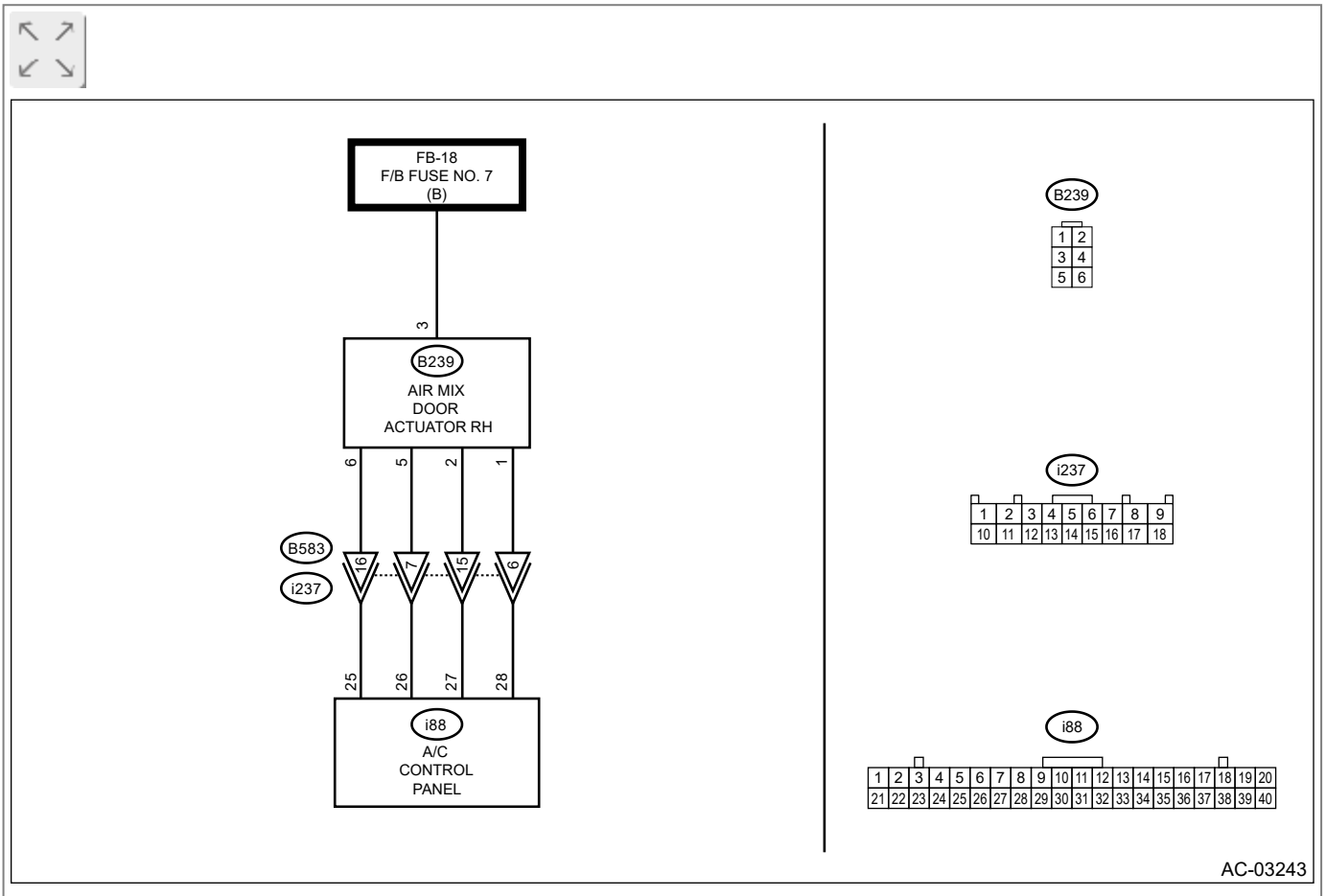
Air mix door actuator stepping motor circuit is open.

Trouble symptom:

Temperature cannot be adjusted.


Wiring diagram:

Air conditioning system  [Ref. to WIRING SYSTEM>Air Conditioning_System>WIRING DIAGRAM.](#)



AC-03243

1. CHECK CONNECTOR.

1. Check the condition of connector connection.
2. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14E3 displayed?

Yes

 [Go to 2.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK AIR MIX DOOR ACTUATOR.

1. Turn the ignition switch to OFF.
2. Disconnect the air mix door actuator connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between the air mix door actuator connector terminal and chassis ground.

Connector & terminal

(B239) No. 3 (+) — Chassis ground (—):

Is the voltage approx. 10 V or more?

Yes

 [Go to 3.](#)

No

Check the DC power supply circuit.

3. CHECK AIR MIX DOOR ACTUATOR.

1. Turn the ignition switch to OFF.
2. Measure the internal resistance of the air mix door actuator using a tester.

Terminals

No. 3 — No. 1:

No. 3 — No. 2:

No. 3 — No. 5:


No. 3 — No. 6:

Is the resistance 80 — 100 Ω ?

Yes

 [Go to 4.](#)

No

Replace the actuator.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Air Mix Door Actuator>REMOVAL.](#)

4. CHECK HARNESS BETWEEN A/C CONTROL PANEL AND AIR MIX DOOR ACTUATOR (OPEN).

1. Disconnect the A/C control panel connector.
2. Measure the resistance between A/C control panel and air mix door actuator connector.

Connector & terminal

(B239) No. 1 — (i88) No. 28:

(B239) No. 2 — (i88) No. 27:

(B239) No. 5 — (i88) No. 26:

(B239) No. 6 — (i88) No. 25:

Is there continuity?

Yes

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

No

Repair or replace the open circuit of harness.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B14E4 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT (PASSENGER)

DTC detecting condition:

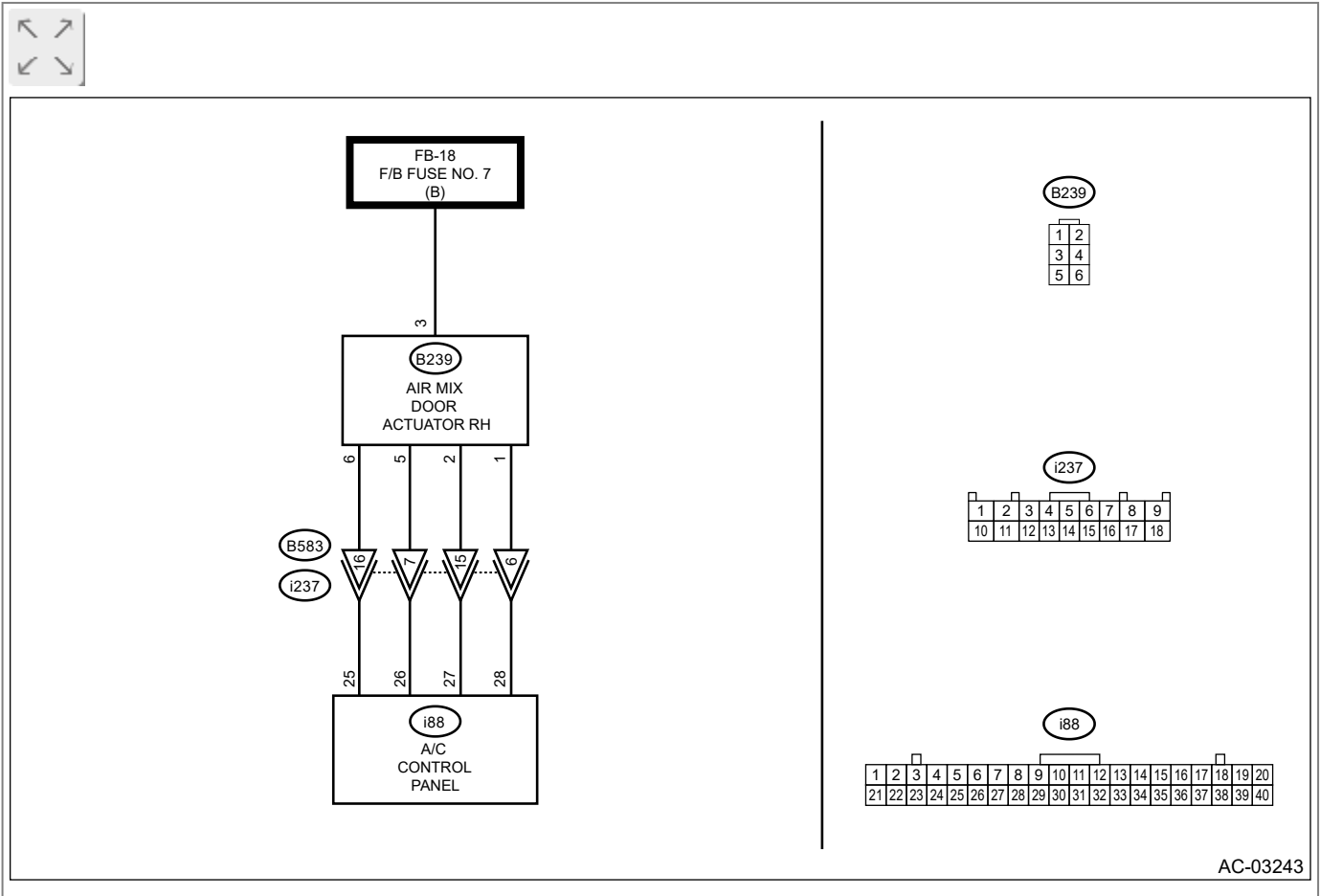
Air mix door actuator stepping motor circuit is shorted.

Trouble symptom:


Temperature cannot be adjusted.

Wiring diagram:

Air conditioning system  [Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.](#)




1. CHECK CONNECTOR.

1. Check the condition of connector connection.
2. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14E4 displayed?

Yes

 [Go to 2.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK POWER SUPPLY OF AIR MIX DOOR ACTUATOR.


1. Turn the ignition switch to OFF.
2. Disconnect the air mix door actuator connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between the air mix door actuator connector terminal and chassis ground.

Connector & terminal

(B239) No. 3 (+) — Chassis ground (-):

Is the voltage approx. 10 V or more?

Yes

 [Go to 3.](#)

No

Check the DC power supply circuit.

3. CHECK AIR MIX DOOR ACTUATOR.

1. Turn the ignition switch to OFF.
2. Measure the internal resistance of the air mix door actuator using a tester.

Terminals

No. 3 — No. 1:

No. 3 — No. 2:

No. 3 — No. 5:


No. 3 — No. 6:

Is the resistance 80 — 100 Ω ?

Yes

 [Go to 4.](#)

No

Replace the actuator.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Air Mix Door Actuator>REMOVAL.](#)

4. CHECK HARNESS BETWEEN A/C CONTROL PANEL AND AIR MIX DOOR ACTUATOR (SHORTED TO POWER SUPPLY).



1. Disconnect the A/C control panel connector.
2. Measure the voltage between air mix door actuator connector and chassis ground.

Connector & terminal

(B239) No. 1 (+) — Chassis ground (-):

(B239) No. 2 (+) — Chassis ground (-):

(B239) No. 5 (+) — Chassis ground (-):

(B239) No. 6 (+) — Chassis ground (-):

Is there any voltage?

Yes

Repair or replace the short circuit of the harness.

No

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B14E5 MODE DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN

DTC detecting condition:

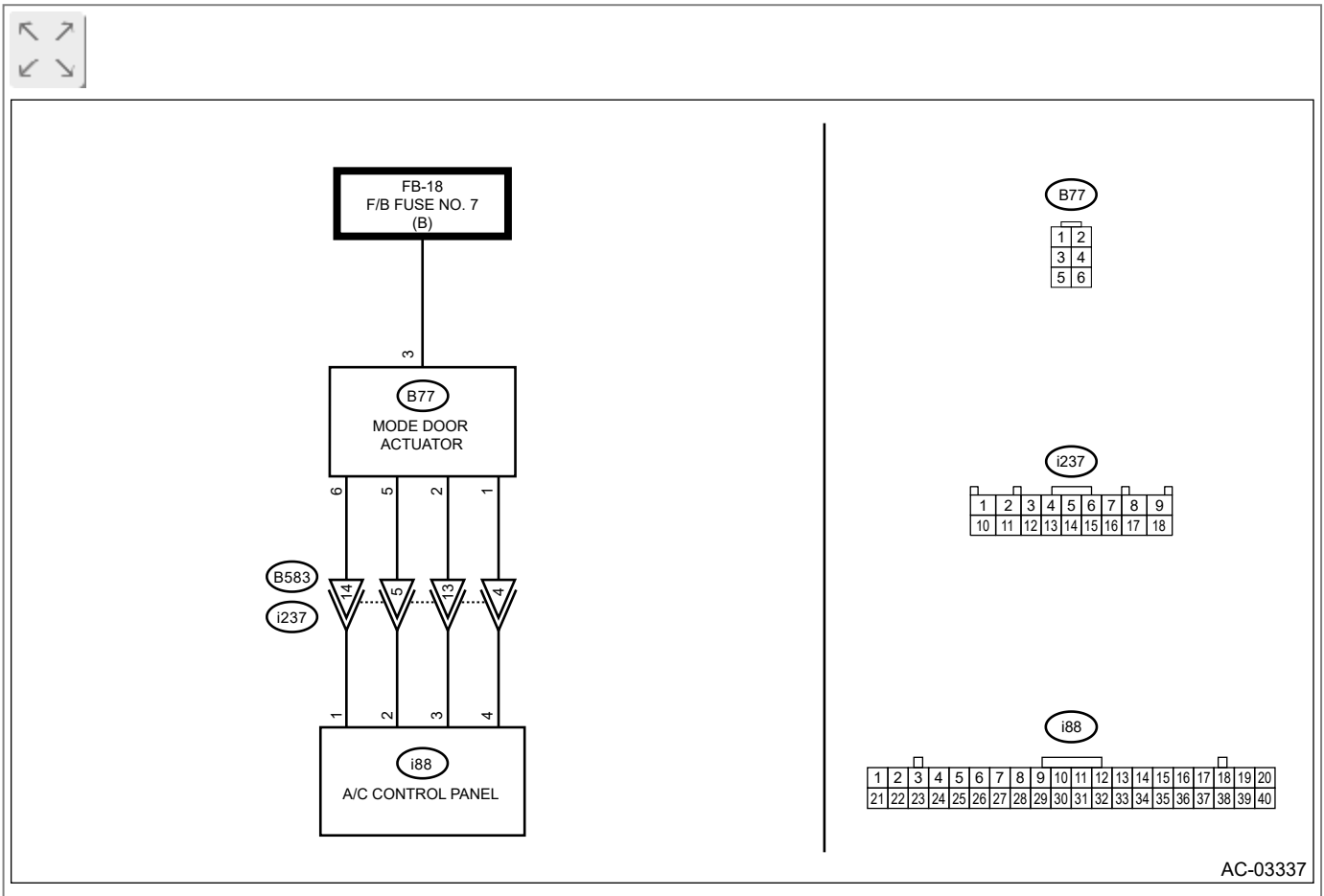
Mode door actuator stepping motor circuit is open.

Trouble symptom:

Vent does not change.


Wiring diagram:

Air conditioning system  [Ref. to WIRING SYSTEM>Air Conditioning_System>WIRING DIAGRAM.](#)




AC-03337

1. CHECK CONNECTOR.

1. Check the condition of connector connection.
2. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14E5 displayed?

Yes

 [Go to 2.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK POWER SUPPLY FOR MODE DOOR ACTUATOR.

1. Turn the ignition switch to OFF.
2. Disconnect the mode door actuator connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between the mode door actuator connector terminal and chassis ground.

Connector & terminal

(B77) No. 3 (+) — Chassis ground (-):

Is the voltage approx. 10 V or more?

Yes

 [Go to 3.](#)

No

Check the DC power supply circuit.

3. CHECK MODE DOOR ACTUATOR.

1. Turn the ignition switch to OFF.
2. Measure the internal resistance of the mode door actuator using a tester.

Terminals

No. 3 — No. 1:


No. 3 — No. 2:

No. 3 — No. 5:


No. 3 — No. 6:

Is the resistance 80 — 100 Ω ?

Yes

 [Go to 4.](#)

No

Replace the actuator.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Mode Door Actuator>REMOVAL.](#)

4. CHECK HARNESS BETWEEN A/C CONTROL PANEL AND MODE DOOR ACTUATOR (OPEN).

1. Disconnect the A/C control panel connector.
2. Measure the resistance between A/C control panel and mode door actuator connector.

Connector & terminal

(B77) No. 1 — (i88) No. 4:

(B77) No. 2 — (i88) No. 3:

(B77) No. 5 — (i88) No. 2:

(B77) No. 6 — (i88) No. 1:

Is there continuity?

Yes

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

No

Repair or replace the open circuit of harness.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B14E6 MODE DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT

DTC detecting condition:

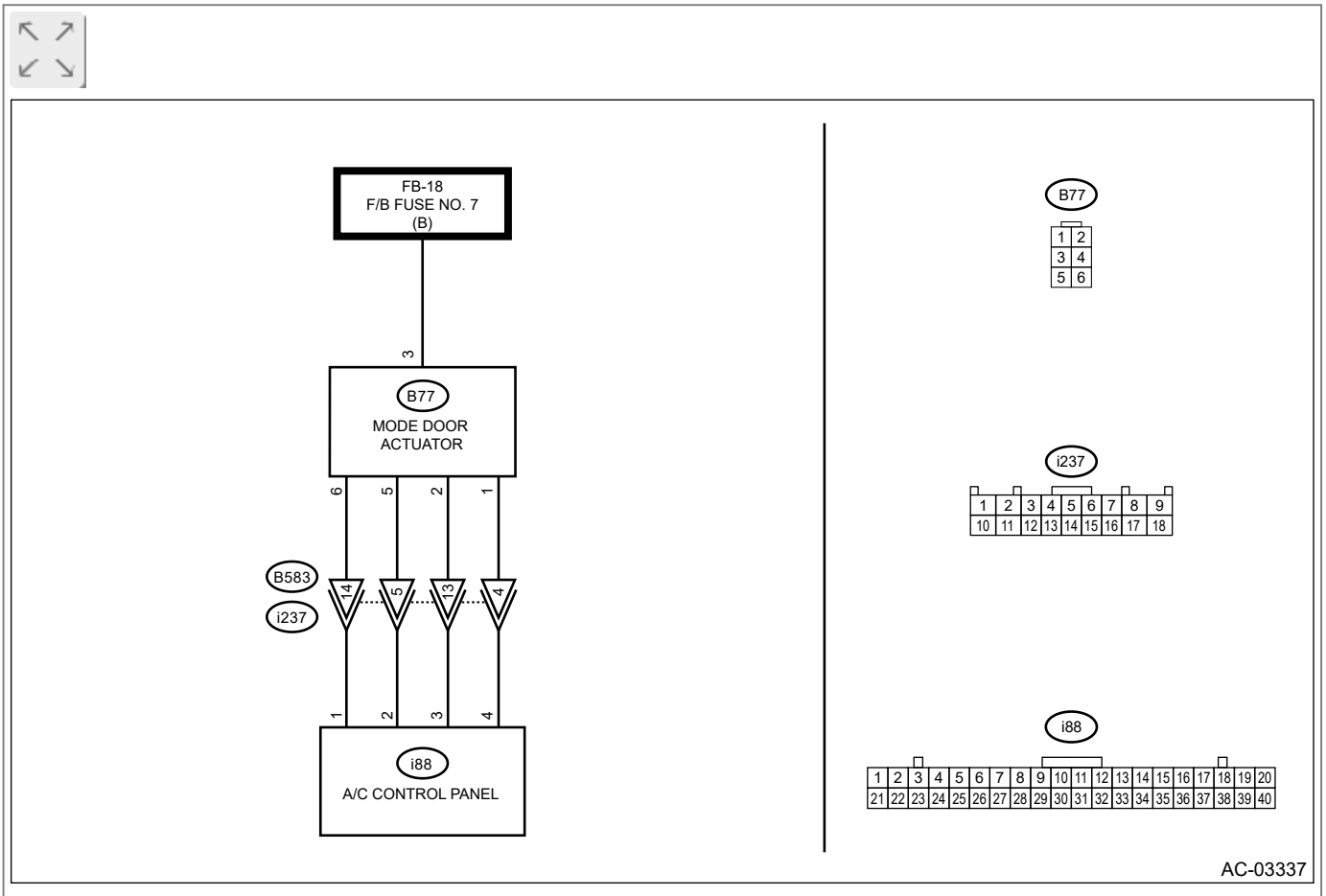
Mode door actuator stepping motor circuit is shorted.

Trouble symptom:

Vent does not change.


Wiring diagram:

Air conditioning system  [Ref. to WIRING SYSTEM>Air Conditioning_System>WIRING DIAGRAM.](#)



AC-03337

1. CHECK CONNECTOR.

1. Check the condition of connector connection.
2. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14E6 displayed?

Yes

 [Go to 2.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK POWER SUPPLY FOR MODE DOOR ACTUATOR.

1. Turn the ignition switch to OFF.
2. Disconnect the mode door actuator connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between the mode door actuator connector terminal and chassis ground.

Connector & terminal

(B77) No. 3 (+) — Chassis ground (-):

Is the voltage approx. 10 V or more?

Yes

 [Go to 3.](#)

No

Check the DC power supply circuit.

3. CHECK MODE DOOR ACTUATOR.

1. Turn the ignition switch to OFF.
2. Measure the internal resistance of the mode door actuator using a tester.

Terminals

No. 3 — No. 1:

No. 3 — No. 2:

No. 3 — No. 5:


No. 3 — No. 6:

Is the resistance 80 — 100 Ω ?

Yes

 [Go to 4.](#)

No

Replace the actuator.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Mode Door Actuator>REMOVAL.](#)

4. CHECK HARNESS BETWEEN A/C CONTROL PANEL AND MODE DOOR ACTUATOR (SHORTED TO POWER SUPPLY).

1. Disconnect the A/C control panel connector.
2. Measure the voltage between mode door actuator connector and chassis ground.

Connector & terminal

(B77) No. 1 (+) — Chassis ground (-):

(B77) No. 2 (+) — Chassis ground (-):

(B77) No. 5 (+) — Chassis ground (-):

(B77) No. 6 (+) — Chassis ground (-):

Is there any voltage?

Yes

Repair or replace the short circuit of the harness.

No

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B14E9 INTAKE DOOR ACTUATOR CIRCUIT OPEN

DTC detecting condition:

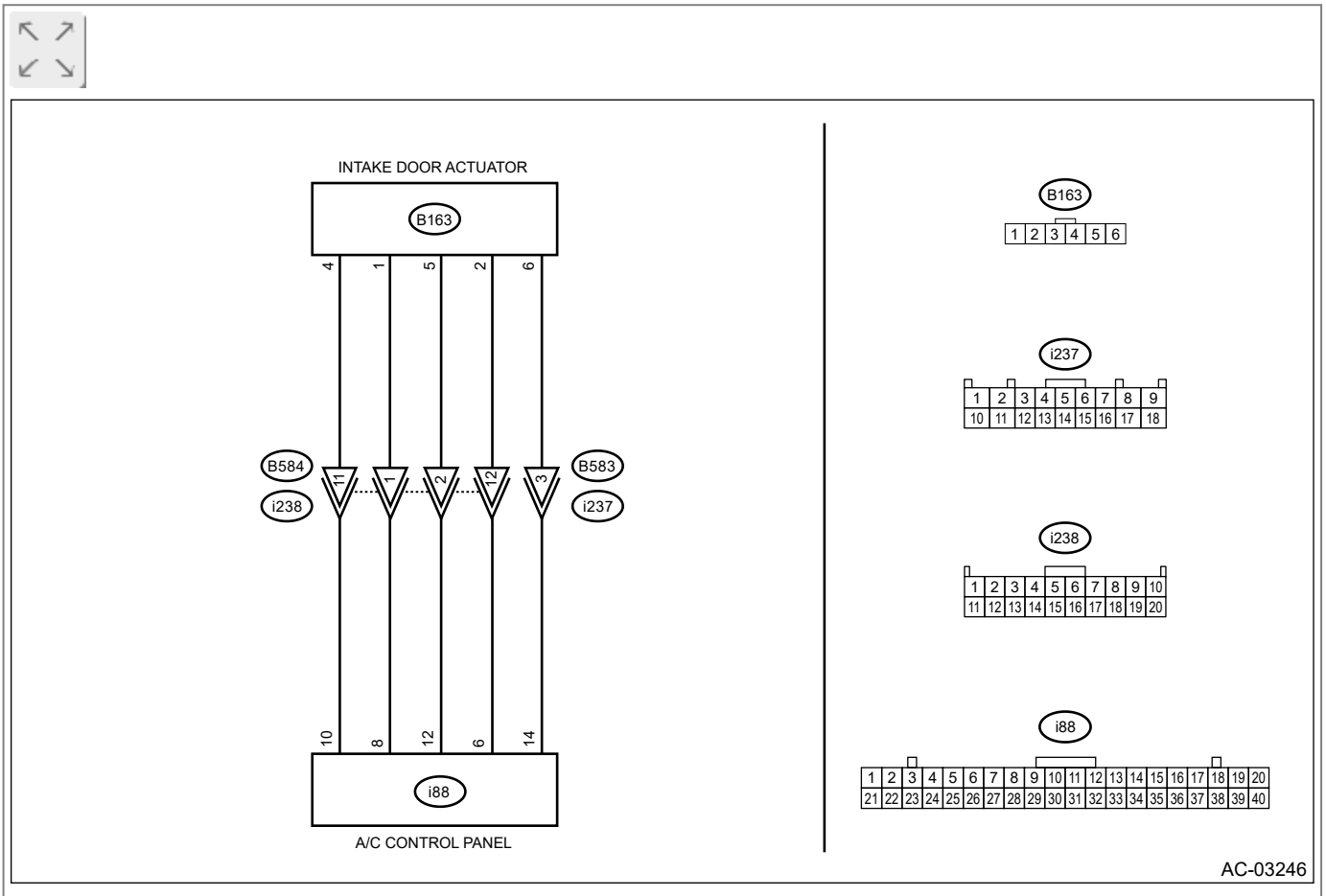
Intake door actuator potentiometer circuit is open.

Trouble symptom:

FRESH/RECIRC does not operate.


Wiring diagram:

Air conditioning system  [Ref. to WIRING SYSTEM>Air Conditioning_System>WIRING DIAGRAM.](#)




AC-03246

1. CHECK CONNECTOR.

1. Check the condition of connector connection.
2. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14E9 displayed?

Yes

 [Go to 2.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS.


1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between terminals.

Connector & terminal

(B163) No. 4 (+) — No. 6 (-):

Is the voltage 4.5 — 5.0 V?

Yes

 [Go to 3.](#)

No

Repair or replace the open circuit of harness.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Using a tester, check continuity between terminals.

Connector & terminal

(B163) No. 1 — (i88) No. 8:

(B163) No. 2 — (i88) No. 6:

(B163) No. 4 — (i88) No. 10:

(B163) No. 5 — (i88) No. 12:

(B163) No. 6 — (i88) No. 14:

Is there continuity?

Yes

 [Go to 4.](#)

No

Repair or replace the open circuit of harness.

4. CHECK ACTUATOR.

1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between terminals.

Connector & terminal


(B163) No. 5 (+) — No. 6 (-):

Is the voltage 0.5 — 4.5 V?

Yes

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

No

 [Go to 5.](#)

5. CHECK HARNESS (SHORTED BETWEEN LINES).



1. Turn the ignition switch to OFF.
2. Using the tester, measure the resistance between terminals.

Connector & terminal


(B163) No. 4 — No. 5:

Is the resistance less than 1 Ω ?

Yes

Repair or replace the short circuit of the harness.

No

Replace the actuator.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>FRESH/RECIRC Door Actuator>REMOVAL.](#)

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B14EA INTAKE DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT

DTC detecting condition:

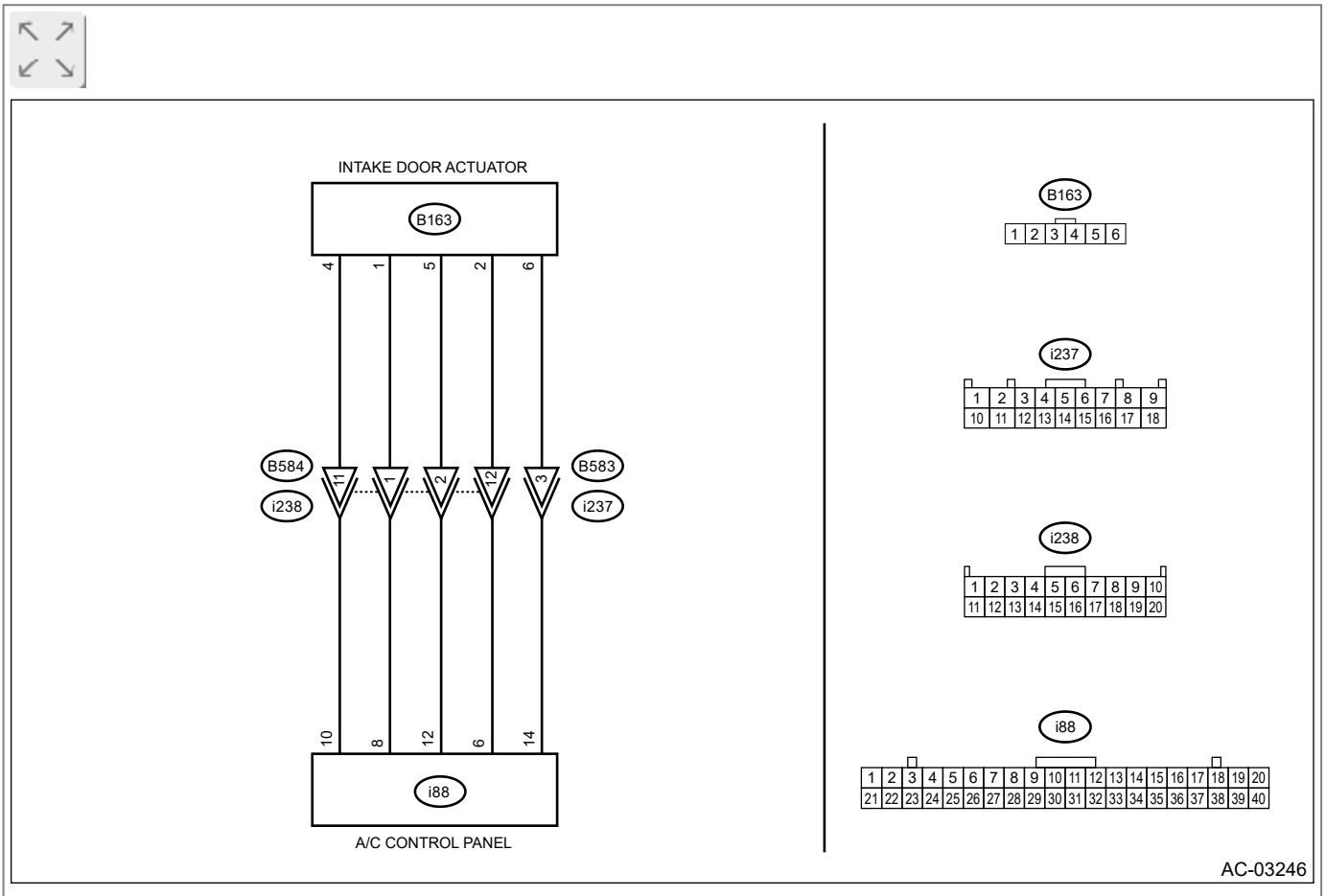
Intake door actuator potentiometer circuit is shorted.

Trouble symptom:

FRESH/RECIRC does not operate.


Wiring diagram:

Air conditioning system  [Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.](#)



AC-03246

1. CHECK CONNECTOR.

1. Check the condition of connector connection.
2. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14EA displayed?

Yes

 [Go to 2.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK ACTUATOR.

1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between terminals.

Connector & terminal

(B163) No. 4 (+) — No. 6 (-):

Is the voltage 4.5 — 5.0 V?

Yes

 [Go to 3.](#)

No

Repair or replace the open circuit of harness.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Using a tester, check continuity between terminals.

Connector & terminal

(B163) No. 4 — (i88) No. 10:

(B163) No. 5 — (i88) No. 12:

(B163) No. 6 — (i88) No. 14:

Is there continuity?

Yes

 [Go to 4.](#)

No

Repair or replace the open circuit of harness.

4. CHECK ACTUATOR.

1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between terminals.

Connector & terminal


(B163) No. 5 (+) — No. 6 (-):

Is the voltage 0.5 — 4.5 V?

Yes

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

No

 [Go to 5.](#)

5. CHECK HARNESS (SHORTED BETWEEN LINES).



1. Turn the ignition switch to OFF.
2. Using the tester, measure the resistance between terminals.


Connector & terminal
(B163) No. 5 — No. 6:

Is the resistance less than 1 Ω ?

Yes

Repair or replace the short circuit of the harness.

No

Replace the actuator.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>FRESH/RECIRC Door Actuator>REMOVAL.](#)

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B14EB INTAKE DOOR ACTUATOR STUCK

DTC detecting condition:

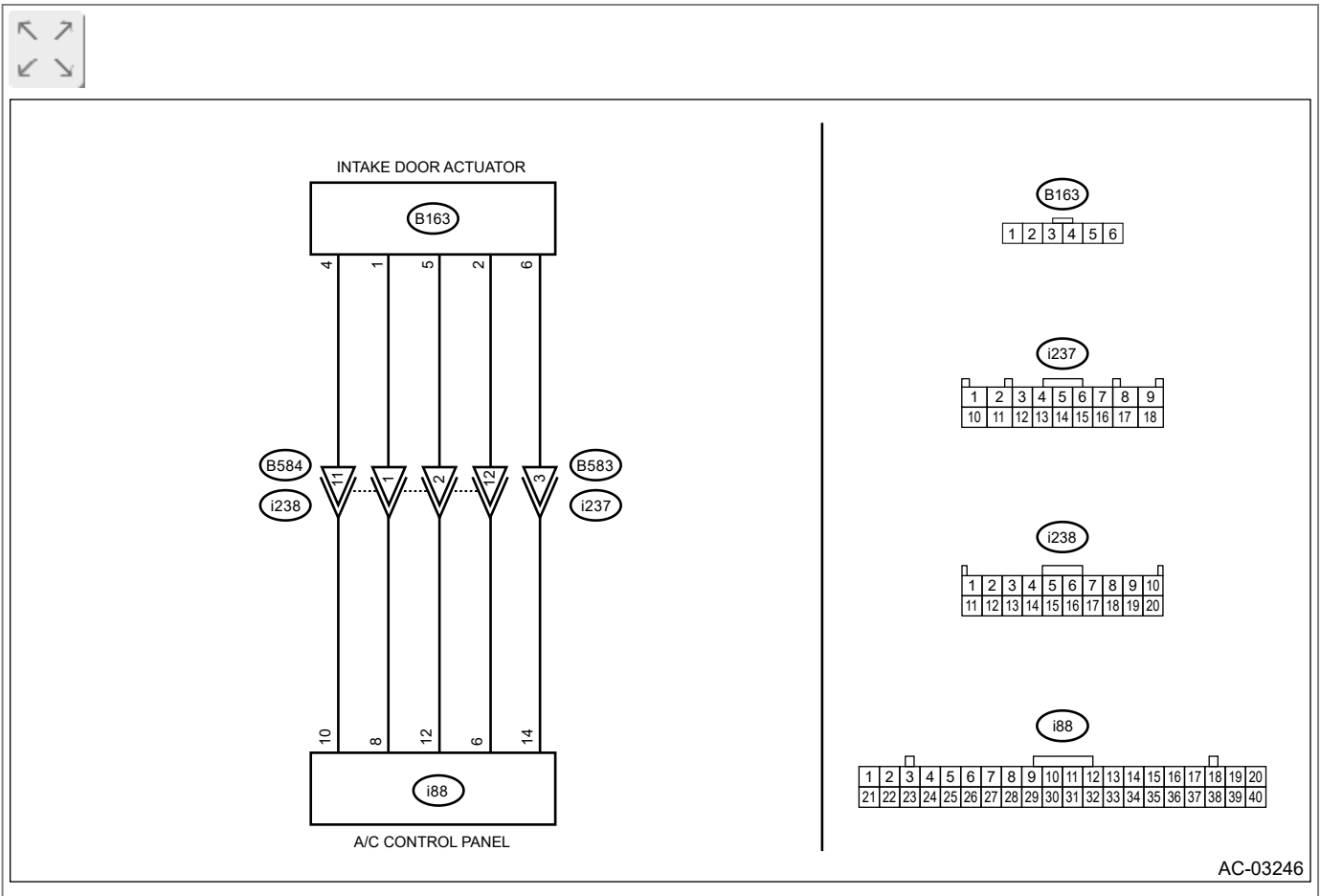
- Intake door actuator is locked.
- The potentiometer value of the actuator does not change.

Trouble symptom:


FRESH/RECIRC does not operate.

Wiring diagram:

Air conditioning system  [Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.](#)




1. CHECK CONNECTOR.

1. Check the condition of connector connection.
2. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14EB displayed?

Yes

 [Go to 2.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK DATA MONITOR.


Using the Subaru Select Monitor, perform [Fresh/Rec Air Dr Act Trgt Open Angle].

Did the actuator move to the specified target opening angle?

Yes

Intake door actuator circuit is normal.

No

 [Go to 3.](#)

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between terminals.

Connector & terminal

(i176) No. 4 (+) — No. 6 (-):

Is the voltage 4.5 — 5.0 V?

Yes

 [Go to 4.](#)

No

Repair or replace the open circuit of harness.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the connector from the A/C control panel.
2. Using a tester, check continuity between terminals.

Connector & terminal

(i163) No. 1 — (i88) No. 8:

(i163) No. 2 — (i88) No. 6:


(i163) No. 4 — (i88) No. 10:

(i163) No. 5 — (i88) No. 12:

(i163) No. 6 — (i88) No. 14:

Is there continuity?

Yes


 [Go to 5.](#)

No

Repair or replace the open circuit of harness.

5. CHECK INTAKE DOOR ACTUATOR.




Check the intake door actuator parts.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>FRESH/RECIRC Door Actuator.](#)

Is the check result OK?

Yes

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

No

Replace the actuator.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>FRESH/RECIRC Door Actuator>REMOVAL.](#)

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

Detected when CAN line abnormality is detected.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

Detected when CAN data is not received from engine control module (ECM).

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM

Detected when CAN data is not received from engine control module (ECM).

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

Detected when CAN data is not received from VDC.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE

This is detected when CAN signal is not received from BIU.

Note:


Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

Detected when CAN data from combination meter does not arrive.

Note:


Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"

This is detected when CAN data from engine control module (ECM) is abnormal.

Note:


Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0402 INVALID DATA RECEIVED FROM TCM

This is detected when CAN data from TCM is abnormal.

Note:


Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

This is detected when CAN data from VDC is abnormal.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE

This is detected when CAN data from BIU is abnormal.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE

Detected when CAN data from combination meter is abnormal.

Note:


Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Air Conditioner], and then select [Enter].
5. On [Select Function] display, select [DTC].

Note:

- For detailed operation procedures, refer to “Application help”.
- For details concerning DTC, refer to the List of Diagnostic Trouble Codes (DTC).
 [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

INSPECTION

1. NOTHING IS DISPLAYED ON THE SCREEN OR INDICATORS DO NOT ILLUMINATE

Trouble symptom:

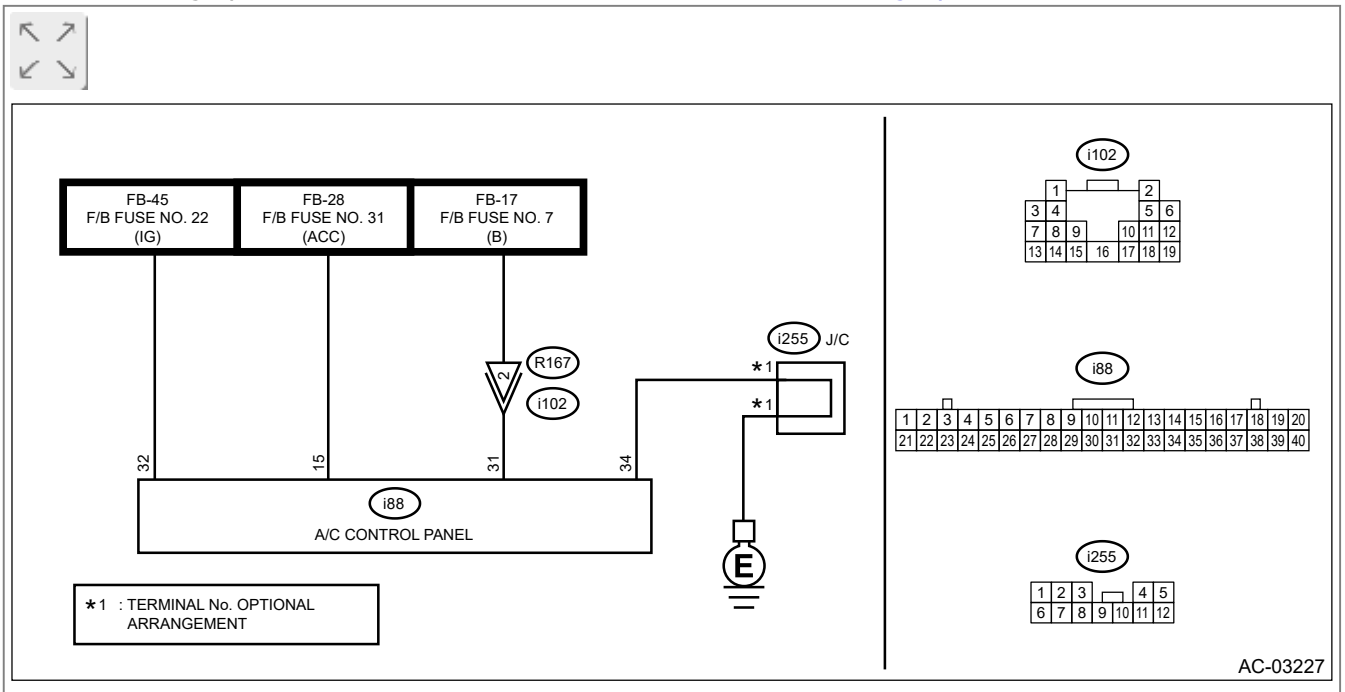
- When the AUTO button is pressed with IGN ON, nothing is displayed on the screen or indicators do not illuminate.
- Self diagnosis using A/C control panel does not operate.

Trouble causes:

- A/C control panel power supply circuit failure
- CAN communication failure

Wiring diagram:

Air conditioning system  [Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.](#)



1. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Remove a fuse from fuse & relay box.
3. Check the condition of fuse.

Is the check result OK?

Yes

 [Go to 2.](#)

No

Replace the fuse. If the replaced fuse blows out easily, repair the ground short circuit in harness between the fuse — A/C control panel.


2. CHECK CONNECTOR.



Check for poor contact of connector.

Is the check result OK?

Yes

 [Go to 3.](#)

No

Repair the connector.

3. CHECK A/C CONTROL PANEL POWER CIRCUIT.



1. Remove the A/C control panel.
2. Disconnect the A/C control panel connector.
3. Measure the voltage between A/C control panel connector terminal and chassis ground after turning the ignition switch to ON.

Connector & terminal


(i88) No. 15 (+) — Chassis ground (-):

(i88) No. 31 (+) — Chassis ground (-):

(i88) No. 32 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

Check for open or short circuit in the harness between A/C control panel and fuse.

4. CHECK A/C CONTROL PANEL GROUND CIRCUIT (OPEN).



Measure the resistance of harness between A/C control panel and chassis ground after turning the ignition switch to OFF.

Connector & terminal

(i88) No. 34 — Chassis ground:

Is the resistance less than 10 Ω ?

Yes

 [Go to 5.](#)

No

Repair the harness for ground line.

5. CHECK FOR POOR CONTACT.

Check poor contact of A/C control panel connector.

Is the check result OK?

Yes

Replace the A/C control panel. [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

No

Repair the connector.

2. AIR CONDITIONER DOES NOT STOP EVEN WHEN THE OFF SWITCH IS PRESSED

Trouble symptom:

Even when the OFF switch is pressed, the blower fan does not turn off, the inlet opening remains in FRESH mode, and the compressor does not turn off.

Trouble causes:

- CAN communication failure
- A/C control panel failure
- Blower motor failure
- Intake door actuator failure
- Compressor failure

1. CHECK A/C CONTROL PANEL.

1. Turn the ignition switch to ON.

2. Press the OFF switch of the A/C control panel.

3. Using Subaru Select Monitor, check the following data of the data monitor. [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Data Monitor.](#)

- Blower Fan Level
- Fresh/Recircle Air Door Actuator Position Target

Does [Blower Fan Level] indicate 0, and [Fresh/Recircle Air Door Actuator Position Target] indicate 100%?

Yes

[Go to 2.](#)

No

Replace the A/C control panel. [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

2. CHECK BLOWER MOTOR.


With the OFF switch pressed, check the blower motor operation.

Is the blower motor stopped?

Yes

 [Go to 3.](#)

No

 [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > AIR GOES OUT OF CONTROL.](#)

3. CHECK INTAKE DOOR ACTUATOR.


With the OFF switch pressed, check the FRESH/RECIRC door operation.

Does the FRESH/RECIRC door set to FRESH?

Yes

 [Go to 4.](#)

No

 [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > UNABLE TO SWITCH SUCTION VENTS.](#)

4. CHECK COMPRESSOR.

With the OFF switch pressed, check the compressor operation.

Is the compressor stopped?


Yes

The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

 [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > COLD AIR DOES NOT COME OUT EVEN WHEN THE A/C SWITCH IS PRESSED. THE GLASS CANNOT BE DEFOGGED. \(COMPRESSOR DOES NOT OPERATE.\).](#)

3. THE WINDSHIELD GLASS IS NOT CLEARED EVEN WHEN THE DEF SWITCH IS PRESSED


Trouble symptom:

Defroster indicator does not illuminate, outlet opening does not switch to DEF, compressor does not switch to ON, and inlet opening does not switch to FRESH, when pressing the DEF switch.

Trouble causes:

- CAN communication failure
- A/C control panel failure
- Mode door actuator failure
- Compressor failure
- Intake door actuator failure

1. CHECK A/C CONTROL PANEL.

1. Turn the ignition switch to ON.
2. Press the DEF switch of the A/C control panel.
3. Using Subaru Select Monitor, check the following data of the data monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Data Monitor.](#)
 - Mode Door Actuator Position Target
 - Fresh/Recircle Air Door Actuator Position Target

Does [Mode Door Actuator Position Target] indicate 100%, and [Fresh/Recircle Air Door Actuator Position Target] indicate 100%?

Yes

 [Go to 2.](#)

No

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

2. CHECK MODE DOOR ACTUATOR.


With the DEF switch ON, check the mode door operation.

Does the air come out from the DEF outlet opening?

Yes

 [Go to 3.](#)

No

 [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > UNABLE TO SWITCH VENTS.](#)

3. CHECK INTAKE DOOR ACTUATOR.


With the DEF switch ON, check the FRESH/RECIRC door operation.

Is FRESH/RECIRC switch turned to "FRESH"?

Yes

 [Go to 4.](#)

No

 [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostics with](#)

4. CHECK COMPRESSOR.



With the DEF switch ON, check the compressor operation.

Does the compressor operate?


Yes

The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

 [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > COLD AIR DOES NOT COME OUT EVEN WHEN THE A/C SWITCH IS PRESSED. THE GLASS CANNOT BE DEFOGGED. \(COMPRESSOR DOES NOT OPERATE.\).](#)

4. COLD AIR NOT EMITTED

Trouble symptom:

Cold air not emitted.

Trouble causes:

- Airflow capacity failure
- Refrigerant pressure failure
- CAN communication failure
- A/C control panel failure
- Air mix actuator RH failure
- Air mix actuator LH failure (only with left/right independent air conditioning function)
- Intake door actuator failure
- Evaporator sensor failure
- In-vehicle sensor failure
- Ambient sensor failure
- Sunload sensor failure

1. CHECK MAX COOL.



Set the A/C control panel dials as follows.

Temperature control dial: MAX COOL

FRESH/RECIRC switch: RECIRC

Mode switch or mode dial: VENT

A/C switch: ON

Does it fail to blow the cold air?


Yes

 [Go to 2.](#)

No

 [Go to 4.](#)

2. CHECK AIRFLOW CAPACITY.

Check the airflow capacity.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > AIR DOES NOT COME OUT, OR AIRFLOW CAPACITY IS INSUFFICIENT.](#)

Is the check result OK?


Yes

 [Go to 3.](#)

No

Perform repair according to inspection procedure.

3. CHECK AMOUNT OF REFRIGERANT PRESSURE.

Check the refrigerant pressure.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Refrigerant Pressure with Manifold Gauge Set>PROCEDURE > CHECK REFRIGERANT GAS PRESSURE.](#)

Is the check result OK?


Yes

 [Go to 4.](#)

No

Perform repair according to refrigerant pressure inspection.

4. CHECK A/C CONTROL PANEL.

1. Turn the temperature control dials (driver's side) and (passenger's side) to MAX COOL.
2. Using Subaru Select Monitor, check the following data of the data monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Data Monitor.](#)
 - Heater Control Panel Setting Value (Driver's)
 - Heater Control Panel Setting Value (Passenger's)

Do [Heater Control Panel Setting Value (Driver's)] and [Heater Control Panel Setting Value (Passenger's)] indicate "60" *1?


Yes

 [Go to 5.](#)

No


Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

5. CHECK A/C CONTROL PANEL.

1. Turn the temperature control dials (driver's side) and (passenger's side) to MAX HOT.
2. Using Subaru Select Monitor, check the following data of the data monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Data Monitor.](#)
 - Heater Control Panel Setting Value (Driver's)
 - Heater Control Panel Setting Value (Passenger's)

Do [Heater Control Panel Setting Value (Driver's)] and [Heater Control Panel Setting Value (Passenger's)] indicate "90" *2?


Yes

 [Go to 6.](#)

No


Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

6. CHECK DTC.

1. Turn the ignition switch to ON.
2. Turn the temperature control dial at MAX COOL and leave for 16 seconds or more. (For vehicles with left/right independent air conditioner, perform setting on both sides.)
3. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14E1, B14E2, B14E3 or B14E4 displayed?

Yes


Perform the diagnosis for the displayed DTC B14E1, B14E2, B14E3 or B14E4.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E1 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN \(DRIVER\).](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E2 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT \(DRIVER\).](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E3 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN \(PASSENGER\).](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E4 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT \(PASSENGER\).](#)

No

 [Go to 7.](#)

7. CHECK DTC.







1. Turn the ignition switch to ON.
2. Turn the temperature control dial at MAX HOT and leave for 16 seconds or more. (For vehicles with left/right independent air conditioner, perform setting on both sides.)
3. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14E1, B14E2, B14E3 or B14E4 displayed?

Yes

Perform the diagnosis for the displayed DTC B14E1, B14E2, B14E3 or B14E4.

 [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E1 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN \(DRIVER\).](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E2 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT \(DRIVER\).](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E3 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN \(PASSENGER\).](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E4 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT \(PASSENGER\).](#)

No

 [Go to 8.](#)

8. CHECK INTAKE DOOR ACTUATOR.




Visually check the intake door actuator operation.

Is the check result OK?

Yes


 [Go to 9.](#)

No

Check the intake door actuator.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > UNABLE TO SWITCH SUCTION VENTS.](#)


9. CHECK EVAPORATOR SENSOR UNIT.




Perform the inspection of evaporator sensor unit.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Evaporator Sensor>INSPECTION.](#)

Is the check result OK?


Yes

 [Go to 10.](#)

No


Replace the evaporator sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Evaporator Sensor>REMOVAL.](#)

10. CHECK IN-VEHICLE SENSOR UNIT.

Check in-vehicle sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>In-Vehicle Sensor \(Auto A/C Model\)>INSPECTION.](#)

Is the check result OK?


Yes

 [Go to 11.](#)

No


Replace the in-vehicle sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>In-Vehicle Sensor \(Auto A/C Model\)>REMOVAL.](#)

11. CHECK AMBIENT SENSOR UNIT.


Check the ambient sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Ambient Sensor>INSPECTION.](#)

Is the check result OK?


Yes

 [Go to 12.](#)

No

Replace the ambient sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Ambient Sensor>REMOVAL.](#)

12. CHECK SUNLOAD SENSOR UNIT.

Check the sunload sensor unit.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Sunload Sensor \(Auto A/C Model\)>INSPECTION.](#)

Is the check result OK?


Yes

The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

Replace the sunload sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Sunload Sensor \(Auto A/C Model\)>REMOVAL.](#)

*1: For the 75°F center specification. Note that 18 for 25°C center specification and 15 for 22°C center specification.

*2: For the 75°F center specification. Note that 32 for 25°C center specification and 29 for 22°C center specification.

5. WARM AIR NOT EMITTED

Trouble symptom:

Warm air not emitted.

Trouble causes:

- Airflow capacity failure
- Coolant level failure
- CAN communication failure
- A/C control panel failure
- Air mix actuator RH failure
- Air mix actuator LH failure (only with left/right independent air conditioning function)
- Intake door actuator failure
- Evaporator sensor failure
- In-vehicle sensor failure
- Ambient sensor failure
- Sunload sensor failure

1. CHECK MAX HOT.

Set the A/C control panel dials as follows.

Temperature control dial: MAX HOT

FRESH/RECIRC switch: FRESH

Mode switch or mode dial: HEAT

A/C switch: OFF

Does it fail to blow the hot air?


Yes

 [Go to 2.](#)

No

 [Go to 4.](#)

2. CHECK AIRFLOW CAPACITY.

Check the airflow capacity.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > AIR DOES NOT COME OUT, OR AIRFLOW CAPACITY IS INSUFFICIENT.](#)

Is the check result OK?

Yes

 [Go to 3.](#)

No

Perform repair according to inspection procedure.

3. CHECK ENGINE COOLANT.




Check engine coolant amount.

Is the check result OK?

Yes


 [Go to 4.](#)

No

Fill engine coolant. If there is coolant leakage, repair the leaks according to Engine Cooling System Trouble in General.  [Ref. to COOLING\(H4DO\)>Engine Cooling System Trouble in General.](#)

4. CHECK A/C CONTROL PANEL.



1. Turn the temperature control dials (driver's side) and (passenger's side) to MAX COOL.
2. Using Subaru Select Monitor, check the following data of the data monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Data Monitor.](#)
 - Heater Control Panel Setting Value (Driver's)
 - Heater Control Panel Setting Value (Passenger's)

Do [Heater Control Panel Setting Value (Driver's)] and [Heater Control Panel Setting Value (Passenger's)] indicate "60" *1?

Yes

 [Go to 5.](#)

No

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

5. CHECK A/C CONTROL PANEL.



1. Turn the temperature control dials (driver's side) and (passenger's side) to MAX HOT.
2. Using Subaru Select Monitor, check the following data of the data monitor.
 - Heater Control Panel Setting Value (Driver's)
 - Heater Control Panel Setting Value (Passenger's)

Do [Heater Control Panel Setting Value (Driver's)] and Heater Control Panel Setting Value (Passenger's) indicate "90" *2?


Yes

 [Go to 6.](#)

No

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)





6. CHECK DTC.

1. Turn the ignition switch to ON.
2. Turn the temperature control dial at MAX COOL and leave for 16 seconds or more. (For vehicles with left/right independent air conditioner, perform setting on both sides.)
3. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14E1, B14E2, B14E3 or B14E4 displayed?

Yes


Perform the diagnosis for the displayed DTC B14E1, B14E2, B14E3 or B14E4.

 [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E1 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN \(DRIVER\).](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E2 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT \(DRIVER\).](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E3 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN \(PASSENGER\).](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E4 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT \(PASSENGER\).](#)

No





 [Go to 7.](#)

7. CHECK DTC.


1. Turn the ignition switch to ON.
2. Turn the temperature control dial at MAX HOT and leave for 16 seconds or more. (For vehicles with left/right independent air conditioner, perform setting on both sides.)
3. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14E1, B14E2, B14E3 or B14E4 displayed?

Yes

Perform the diagnosis for the displayed DTC B14E1, B14E2, B14E3 or B14E4.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E1 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN \(DRIVER\).](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E2 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT \(DRIVER\).](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E3 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN \(PASSENGER\).](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E4 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT \(PASSENGER\).](#)

No

 [Go to 8.](#)

8. CHECK INTAKE DOOR ACTUATOR.




Visually check the intake door actuator operation.

Is the check result OK?

Yes


 [Go to 9.](#)

No

Check the intake door actuator.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > UNABLE TO SWITCH SUCTION VENTS.](#)


9. CHECK EVAPORATOR SENSOR UNIT.



Perform the inspection of evaporator sensor unit.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Evaporator Sensor>INSPECTION.](#)

Is the check result OK?

Yes


 [Go to 10.](#)

No

Replace the evaporator sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Evaporator Sensor>REMOVAL.](#)


10. CHECK IN-VEHICLE SENSOR UNIT.




Check in-vehicle sensor circuit.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>In-Vehicle Sensor \(Auto A/C Model\)>INSPECTION.](#)

Is the check result OK?


Yes

 [Go to 11.](#)

No


Replace the in-vehicle sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>In-Vehicle Sensor \(Auto A/C Model\)>REMOVAL.](#)

11. CHECK AMBIENT SENSOR UNIT.


Check the ambient sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Ambient Sensor>INSPECTION.](#)

Is the check result OK?


Yes

 [Go to 12.](#)

No

Replace the ambient sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Ambient Sensor>REMOVAL.](#)

12. CHECK SUNLOAD SENSOR UNIT.

Check the sunload sensor unit.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Sunload Sensor \(Auto A/C Model\)>INSPECTION.](#)

Is the check result OK?


Yes

The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

Replace the sunload sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Sunload Sensor \(Auto A/C Model\)>REMOVAL.](#)

*1: For the 75°F center specification. Note that 18 for 25°C center specification and 15 for 22°C center specification.

*2: For the 75°F center specification. Note that 32 for 25°C center specification and 29 for 22°C center specification.

6. COMPARTMENT TEMPERATURE IS EXCESSIVELY LOWER THAN SETTING TEMPERATURE


Trouble symptom:

Compartment temperature is excessively lower than setting temperature.

Trouble causes:


- Large airflow capacity
- Refrigerant pressure failure
- CAN communication failure
- A/C control panel failure
- Air mix actuator RH failure
- Air mix actuator LH failure (only with left/right independent air conditioning function)
- Evaporator sensor failure
- In-vehicle sensor failure
- Ambient sensor failure
- Sunload sensor failure

1. CHECK AIRFLOW CAPACITY.

Check the airflow capacity.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > AIR GOES OUT OF CONTROL.](#)

Is the check result OK?


Yes

 [Go to 2.](#)

No

Perform repair according to inspection procedure.

2. CHECK AMOUNT OF REFRIGERANT PRESSURE.

Check the refrigerant pressure.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Refrigerant Pressure with Manifold Gauge Set>PROCEDURE > CHECK REFRIGERANT GAS PRESSURE.](#)

Is the check result OK?

Yes


 [Go to 3.](#)

No

Perform repair according to refrigerant pressure inspection.

3. CHECK A/C CONTROL PANEL.

1. Turn the temperature control dials (driver's side) and (passenger's side) to MAX COOL.

2. Using Subaru Select Monitor, check the following data of the data monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Data Monitor.](#)

- Heater Control Panel Setting Value (Driver's)
- Heater Control Panel Setting Value (Passenger's)

Do [Heater Control Panel Setting Value (Driver's)] and [Heater Control Panel Setting Value (Passenger's)] indicate "60" *1?


Yes

 [Go to 4.](#)

No

Replace the A/C control panel  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

4. CHECK A/C CONTROL PANEL.

- 1.** Turn the temperature control dials (driver's side) and (passenger's side) to MAX HOT.
- 2.** Using Subaru Select Monitor, check the following data of the data monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Data Monitor.](#)
 - Heater Control Panel Setting Value (Driver's)
 - Heater Control Panel Setting Value (Passenger's)

Do [Heater Control Panel Setting Value (Driver's)] and [Heater Control Panel Setting Value (Passenger's)] indicate "90" *2?


Yes

 [Go to 5.](#)

No



Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)



5. CHECK DTC.

- 1.** Turn the ignition switch to ON.
- 2.** Turn the temperature control dial at MAX COOL and leave for 16 seconds or more. (For vehicles with left/right independent air conditioner, perform setting on both sides.)
- 3.** Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)


Is DTC B14E1, B14E2, B14E3 or B14E4 displayed?

Yes


Perform the diagnosis for the displayed DTC B14E1, B14E2, B14E3 or B14E4.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E1 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN \(DRIVER\).](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble](#)

[Code \(DTC\)>DTC B14E2 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT \(DRIVER\)](#).  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E3 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN \(PASSENGER\)](#).  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E4 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT \(PASSENGER\)](#).

No





 [Go to 6.](#)

6. CHECK DTC.

1. Turn the ignition switch to ON.
2. Turn the temperature control dial at MAX HOT and leave for 16 seconds or more. (For vehicles with left/right independent air conditioner, perform setting on both sides.)
3. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\)](#).

Is DTC B14E1, B14E2, B14E3 or B14E4 displayed?


Yes

Perform the diagnosis for the displayed DTC B14E1, B14E2, B14E3 or B14E4.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E1 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN \(DRIVER\)](#).  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E2 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT \(DRIVER\)](#).  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E3 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN \(PASSENGER\)](#).  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E4 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT \(PASSENGER\)](#).

No

 [Go to 7.](#)

7. CHECK EVAPORATOR SENSOR UNIT.

Perform the inspection of evaporator sensor unit.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Evaporator Sensor>INSPECTION.](#)


Is the check result OK?




Yes

 [Go to 8.](#)

No


Replace the evaporator sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Evaporator Sensor>REMOVAL.](#)

8. CHECK IN-VEHICLE SENSOR UNIT.


Check in-vehicle sensor circuit.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>In-Vehicle Sensor \(Auto A/C Model\)>INSPECTION.](#)

Is the check result OK?


Yes

 [Go to 9.](#)

No


Replace the in-vehicle sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>In-Vehicle Sensor \(Auto A/C Model\)>REMOVAL.](#)

9. CHECK AMBIENT SENSOR UNIT.


Check the ambient sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Ambient Sensor>INSPECTION.](#)

Is the check result OK?


Yes

 [Go to 10.](#)

No

Replace the ambient sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Ambient Sensor>REMOVAL.](#)

10. CHECK SUNLOAD SENSOR UNIT.

Check the sunload sensor unit.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Sunload Sensor \(Auto A/C Model\)>INSPECTION.](#)

Is the check result OK?

Yes

The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

Replace the sunload sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR](#)

No

[AND A/C>Sunload Sensor \(Auto A/C Model\)>REMOVAL.](#)

*1: For the 75°F center specification. Note that 18 for 25°C center specification and 15 for 22°C center specification.

*2: For the 75°F center specification. Note that 32 for 25°C center specification and 29 for 22°C center specification.

7. COMPARTMENT TEMPERATURE IS EXCESSIVELY HIGHER THAN SETTING TEMPERATURE

Trouble symptom:

Compartment temperature is excessively higher than setting temperature.

Trouble causes:

- Large airflow capacity
- CAN communication failure
- A/C control panel failure
- Air mix actuator RH failure
- Air mix actuator LH failure (only with left/right independent air conditioning function)
- Intake door actuator failure
- Evaporator sensor failure
- In-vehicle sensor failure
- Ambient sensor failure
- Sunload sensor failure

1. CHECK AIRFLOW CAPACITY.

Check the airflow capacity. [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > AIR GOES OUT OF CONTROL.](#)

Is the check result OK?

Yes

[Go to 2.](#)

No

Perform repair according to inspection procedure.

2. CHECK A/C CONTROL PANEL.

1. Turn the temperature control dials (driver's side) and (passenger's side) to MAX COOL.
2. Using Subaru Select Monitor, check the following data of the data monitor. [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Data Monitor.](#)
 - Heater Control Panel Setting Value (Driver's)
 - Heater Control Panel Setting Value (Passenger's)

Do [Heater Control Panel Setting Value (Driver's)] and Heater Control Panel Setting Value (Passenger's) indicate "60" *1?


Yes

 [Go to 3.](#)

No

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

3. CHECK A/C CONTROL PANEL.

1. Turn the temperature control dials (driver's side) and (passenger's side) to MAX HOT.
2. Using Subaru Select Monitor, check the following data of the data monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Data Monitor.](#)
 - Heater Control Panel Setting Value (Driver's)
 - Heater Control Panel Setting Value (Passenger's)

Do [Heater Control Panel Setting Value (Driver's)] and Heater Control Panel Setting Value (Passenger's) indicate "90" *2?


Yes

 [Go to 4.](#)

No





Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

4. CHECK DTC.

1. Turn the ignition switch to ON.
2. Turn the temperature control dial at MAX COOL and leave for 16 seconds or more. (For vehicles with left/right independent air conditioner, perform setting on both sides.)
3. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14E1, B14E2, B14E3 or B14E4 displayed?

Yes


Perform the diagnosis for the displayed DTC B14E1, B14E2, B14E3 or B14E4.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E1 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN \(DRIVER\).](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E2 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT \(DRIVER\).](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E3 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN \(PASSENGER\).](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble](#)

[Code \(DTC\)>DTC B14E4 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT \(PASSENGER\).](#)

No

 [Go to 5.](#)





5. CHECK DTC.

1. Turn the ignition switch to ON.
2. Turn the temperature control dial at MAX HOT and leave for 16 seconds or more. (For vehicles with left/right independent air conditioner, perform setting on both sides.)
3. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14E1, B14E2, B14E3 or B14E4 displayed?

Yes

Perform the diagnosis for the displayed DTC B14E1, B14E2, B14E3 or B14E4.

 [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E1 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN \(DRIVER\).](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E2 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT \(DRIVER\).](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E3 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN \(PASSENGER\).](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E4 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT \(PASSENGER\).](#)

No

 [Go to 6.](#)

6. CHECK INTAKE DOOR ACTUATOR.


Visually check the intake door actuator operation.

Is the check result OK?


Yes

 [Go to 7.](#)

No

Check the intake door actuator.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > UNABLE TO SWITCH SUCTION VENTS.](#)

7. CHECK EVAPORATOR SENSOR UNIT.


Perform the inspection of evaporator sensor unit.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Evaporator Sensor>INSPECTION.](#)

Is the check result OK?


Yes

 [Go to 8.](#)

No

Replace the evaporator sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Evaporator Sensor>REMOVAL.](#)

8. CHECK IN-VEHICLE SENSOR UNIT.

Check in-vehicle sensor circuit.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>In-Vehicle Sensor \(Auto A/C Model\)>INSPECTION.](#)

Is the check result OK?


Yes

 [Go to 9.](#)

No


Replace the in-vehicle sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>In-Vehicle Sensor \(Auto A/C Model\)>REMOVAL.](#)

9. CHECK AMBIENT SENSOR UNIT.


Check the ambient sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Ambient Sensor>INSPECTION.](#)

Is the check result OK?


Yes

 [Go to 10.](#)

No

Replace the ambient sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Ambient Sensor>REMOVAL.](#)

10. CHECK SUNLOAD SENSOR UNIT.

Check the sunload sensor unit.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Sunload Sensor \(Auto A/C Model\)>INSPECTION.](#)

Is the check result OK?


Yes

The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

Replace the sunload sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Sunload Sensor \(Auto A/C Model\)>REMOVAL.](#)

*1: For the 75°F center specification. Note that 18 for 25°C center specification and 15 for 22°C center specification.

*2: For the 75°F center specification. Note that 32 for 25°C center specification and 29 for 22°C center specification.

8. AIR DOES NOT COME OUT, OR AIRFLOW CAPACITY IS INSUFFICIENT

Trouble symptom:

- Airflow capacity is insufficient.
- Air does not come out when operating the fan dial.

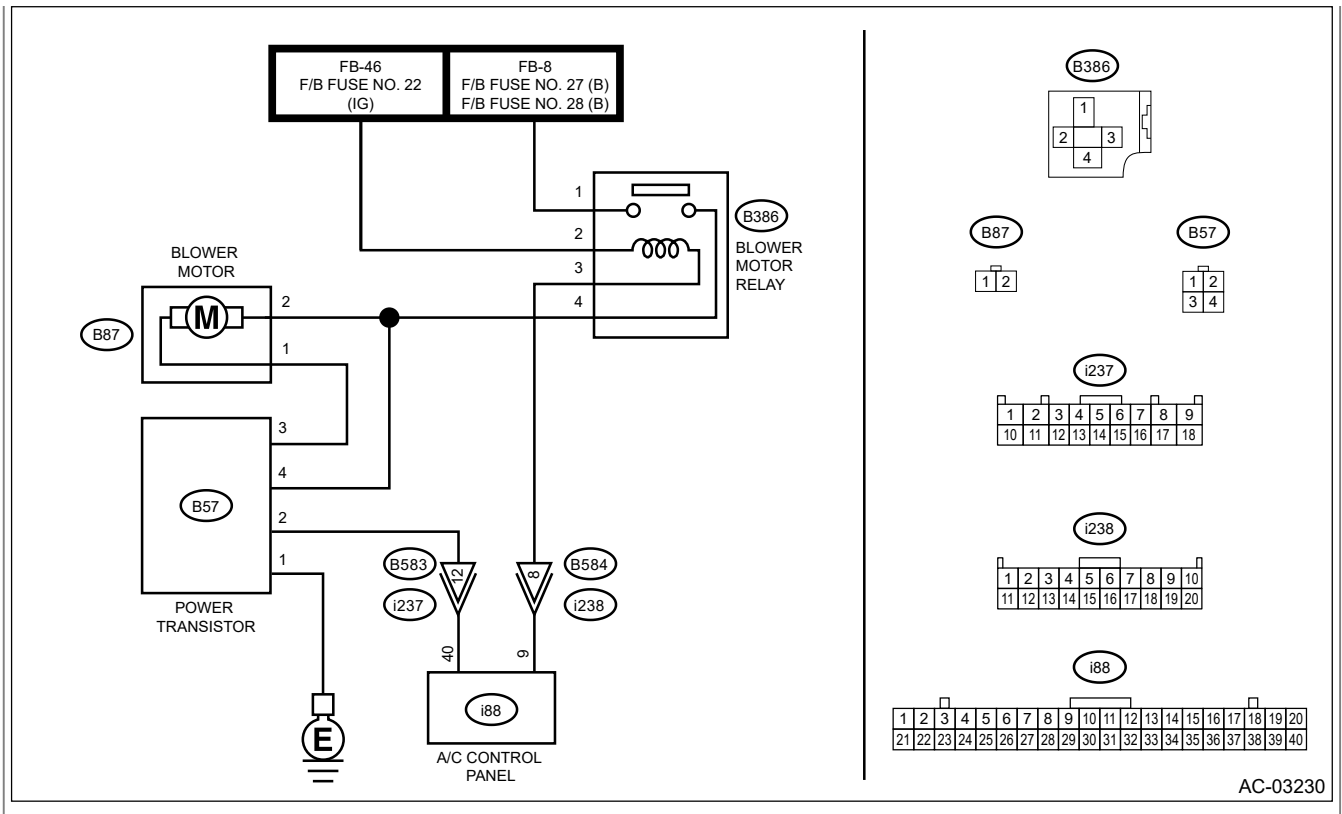
Trouble causes:

- Airflow capacity failure
- CAN communication failure
- A/C control panel failure
- Blower motor failure

Wiring diagram:

Air conditioning system  [Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.](#)





1. CHECK A/C CONTROL PANEL.

1. Using Subaru Select Monitor, check the following data of the data monitor. [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Data Monitor.](#)
 - Air mix door actuator position (driver's side)
 - Air mix door actuator position (passenger's side)
 - Blower Fan Level
2. Turn the temperature control dial at MAX COOL and increase and decrease the A/C control panel fan dial. (For vehicles with left/right independent air conditioner, perform setting on both sides.)

Do [Air mix door actuator position (driver's side)] and Air mix door actuator position (passenger's side) indicate "0%"? Also, does [Blower Fan Level] increase or decrease in accordance with the fan dial operation?

Yes

[Go to 2.](#)

No

[Go to 5.](#)

2. CHECK AIRFLOW CAPACITY.

Turn the temperature control dial to LO (both dials for the models equipped with left/right independent air conditioning function), A/C control panel fan dial to MAX and FRESH/RECIRC switch to RECIRC.

Is the airflow capacity insufficient for the same model?

Yes

 [Go to 3.](#)

No

The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

3. CHECK A/C FILTER.



Check the A/C filter.

Is the check result OK?

Yes

 [Go to 4.](#)

No

Clean or replace the A/C filter.

4. CHECK EACH DUCT.



Check each duct joint for disconnection or clogging.

Is the check result OK?

Yes


 [Go to 5.](#)

No

Repair the faulty duct.

5. CHECK A/C CONTROL PANEL.



1. Turn the ignition switch to ON.
2. Turn the fan dial to the maximum position.
3. Using Subaru Select Monitor, check [Blower Fan Level] of the data monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Data Monitor.](#)

Does [Blower Fan Level] indicate "7"?

Yes

 [Go to 6.](#)

No

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

6. CHECK A/C CONTROL PANEL.

1. Turn the fan dial to the minimum position.
2. Using Subaru Select Monitor, check [Blower Fan Level] of the data monitor.

Does [Blower Fan Level] indicate "1"?

Yes

 [Go to 7.](#)

No

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

7. CHECK CONNECTOR.

Check for poor contact of connector.

Is the check result OK?

Yes

 [Go to 8.](#)

No

Repair the connector.

8. CHECK FUSE.

1. Remove a fuse in the fuse & relay box.
2. Check the condition of fuse.

Is the check result OK?

Yes

 [Go to 9.](#)

No

Replace the fuse.

9. CHECK BLOWER MOTOR RELAY ON SIGNAL.




1. Stop the engine.
2. Turn the fan dial OFF.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between the A/C control panel connector (i88) and chassis ground.

Connector & terminal


(i88) No. 9 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 10.](#)

No

- Check for open or short circuit in the harness between fuse and ECM.
- Check the blower relay connector and relay unit.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Relay and Fuse>INSPECTION > CHECK RELAY.](#)

10. CHECK BLOWER MOTOR RELAY ON SIGNAL.




1. Start the engine.
2. Turn the fan dial to ON.
3. Using a tester, measure the voltage between the A/C control panel connector (i88) and chassis ground.

Connector & terminal

(i88) No. 9 (+) — Chassis ground (-):

Is the voltage 0 V?

Yes

 [Go to 11.](#)

No

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

11. CHECK BLOWER MOTOR POWER SUPPLY CIRCUIT.




1. Turn the ignition switch to ON.
2. Turn the fan dial to ON.
3. Use a tester to measure the voltage between the blower motor connector (B87) and chassis ground.

Connector & terminal


(B87) No. 2 (+) — Chassis ground (—):

Is the voltage 10 V or more?


Yes

 [Go to 12.](#)

No


- Check the blower motor power supply line harness for open circuit or connector disconnection.
- Check the blower relay connector and relay unit.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Relay and Fuse>INSPECTION > CHECK RELAY.](#)

12. CHECK BLOWER MOTOR UNIT.


Check the blower motor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Blower Motor>INSPECTION.](#)

Is the check result OK?

Yes

 [Go to 13.](#)

No

Replace the blower motor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Blower Motor>REMOVAL.](#)

13. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the power transistor and A/C control panel connector.
2. Using a tester, measure the resistance between harness terminals.

Connector & terminal

(B386) No. 4 — (B57) No. 4:


(B87) No. 1 — (B57) No. 3:

(B57) No. 2 — (i88) No. 40:

(B57) No. 1 — Chassis ground:

Is the resistance less than 1 Ω ?

Yes

 [Go to 14.](#)

No

Repair or replace the open circuit of harness.

14. CHECK HARNESS (GROUND SHORT CIRCUIT).

Use a tester to measure the harness resistance between the power transistor connector and chassis ground.

Connector & terminal


(B57) No. 2 — Chassis ground:

Is the resistance less than 1 Ω?

Yes

Repair or replace the short circuit of the harness.

No

 [Go to 15.](#)


15. CHECK POWER TRANSISTOR.



Replace the power transistor with a properly functioning part.

Does the blower motor rotate?

Yes

Replace the power transistor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Power Transistor \(Auto A/C Model\)>REMOVAL.](#)

No

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

9. AIR GOES OUT OF CONTROL

Trouble symptom:

- The blower rotates even though the blower switch is not turned on.
- The blower motor continues to rotate at high speed. (Not adjustable.)

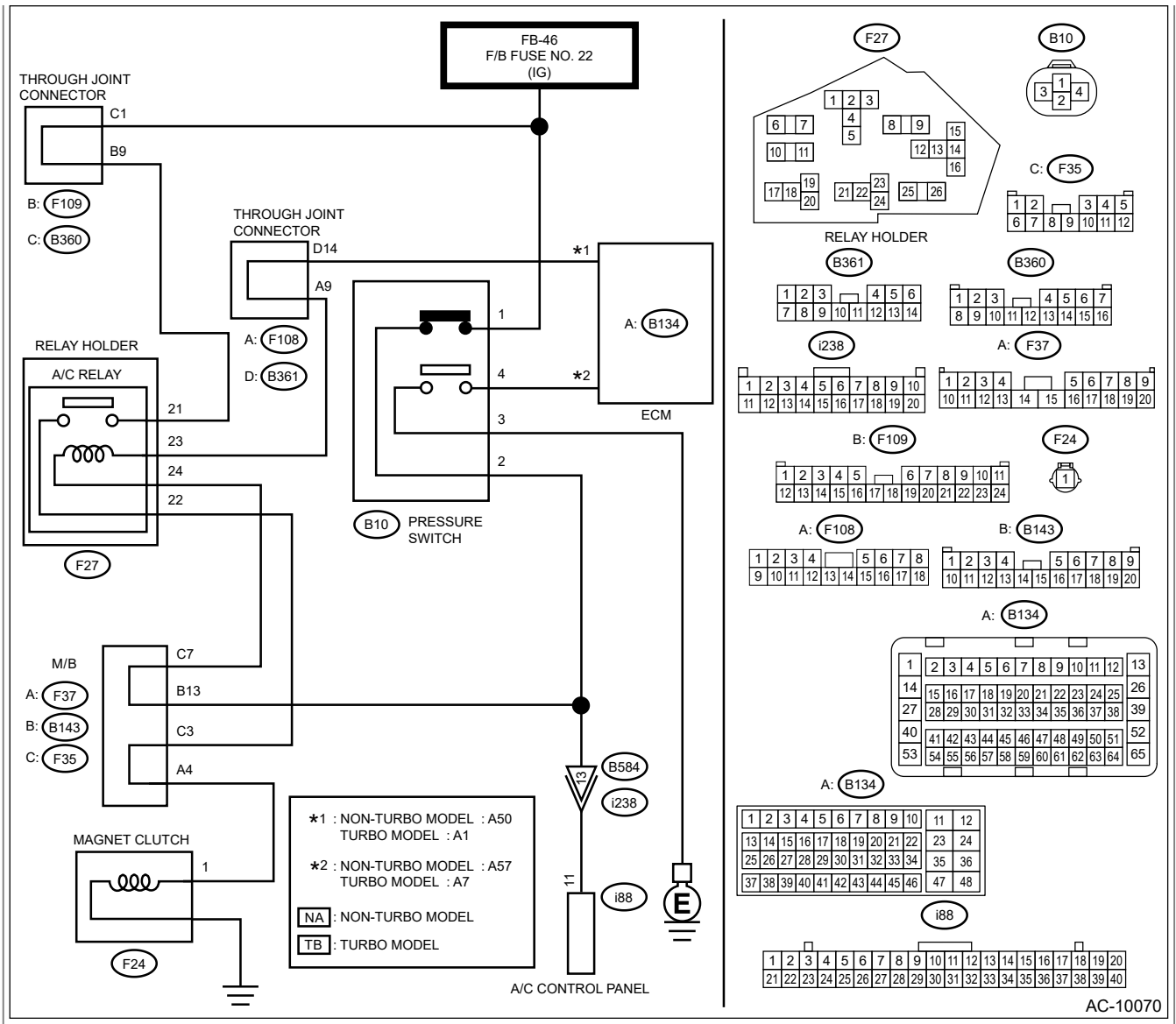
Trouble causes:

- Airflow capacity failure
- CAN communication failure
- A/C control panel failure
- Blower motor failure

Wiring diagram:

Air conditioning system  [Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.](#)





AC-10070

1. CHECK A/C CONTROL PANEL.



1. Turn the ignition switch to ON.
2. Turn the fan dial to the maximum position.
3. Using Subaru Select Monitor, check [Blower Fan Level] of the data monitor. [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Data Monitor.](#)

Does [Blower Fan Level] indicate "7"?

Yes


[Go to 2.](#)

No

Replace the A/C control panel. [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

2. CHECK A/C CONTROL PANEL.



1. Turn the fan dial to the minimum position.
2. Using Subaru Select Monitor, check [Blower Fan Level] of the data monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Data Monitor.](#)

Does [Blower Fan Level] indicate "1"?

Yes

 [Go to 3.](#)

No

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

3. CHECK HARNESS.



1. Turn the ignition switch to OFF.
2. Disconnect the power transistor connector.
3. Use a tester to measure the resistance between the power transistor connector and chassis ground.

Connector & terminal

(B57) No. 4 — Chassis ground:

Is the resistance less than 1 Ω ?

Yes

Repair or replace the short circuit of the harness between blower motor and power transistor.

No

 [Go to 4.](#)

4. CHECK HARNESS.



1. Remove the A/C control panel.
2. Turn the ignition switch to ON.
3. Use a tester to measure the resistance between the power transistor connector and chassis ground.

Connector & terminal

(B57) No. 2 — Chassis ground:

Is the resistance less than 1 Ω ?

Yes

Repair or replace the short circuit of the harness between A/C control panel and power transistor.

No

 [Go to 5.](#)

5. CHECK HARNESS.


1. Connect the disconnected connectors.
2. Turn the ignition switch to ON.
3. Use a tester to measure the voltage between the power transistor connector and chassis ground.

Connector & terminal

(B57) No. 2 (+) — Chassis ground (—):

Is the voltage approx. 9 V when the fan dial is set to 1st, and approx. 3.5 V when set to 6th?

Yes

Replace the power transistor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Power Transistor \(Auto A/C Model\)>REMOVAL.](#)

No

 [Go to 6.](#)

6. CHECK A/C CONTROL PANEL.


1. Turn the fan dial OFF.
2. Disconnect the power transistor connector.
3. Use a tester to measure the resistance between the power transistor connector and chassis ground.

Connector & terminal

(B57) No. 2 — Chassis ground:

When the fan dial is OFF and other than OFF, does the resistance change?

Yes

Replace the power transistor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Power Transistor \(Auto A/C Model\)>REMOVAL.](#)

No

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

10. COLD AIR DOES NOT COME OUT EVEN WHEN THE A/C SWITCH IS PRESSED. THE GLASS CANNOT BE DEFOGGED. (COMPRESSOR DOES NOT OPERATE.)

Trouble symptom:

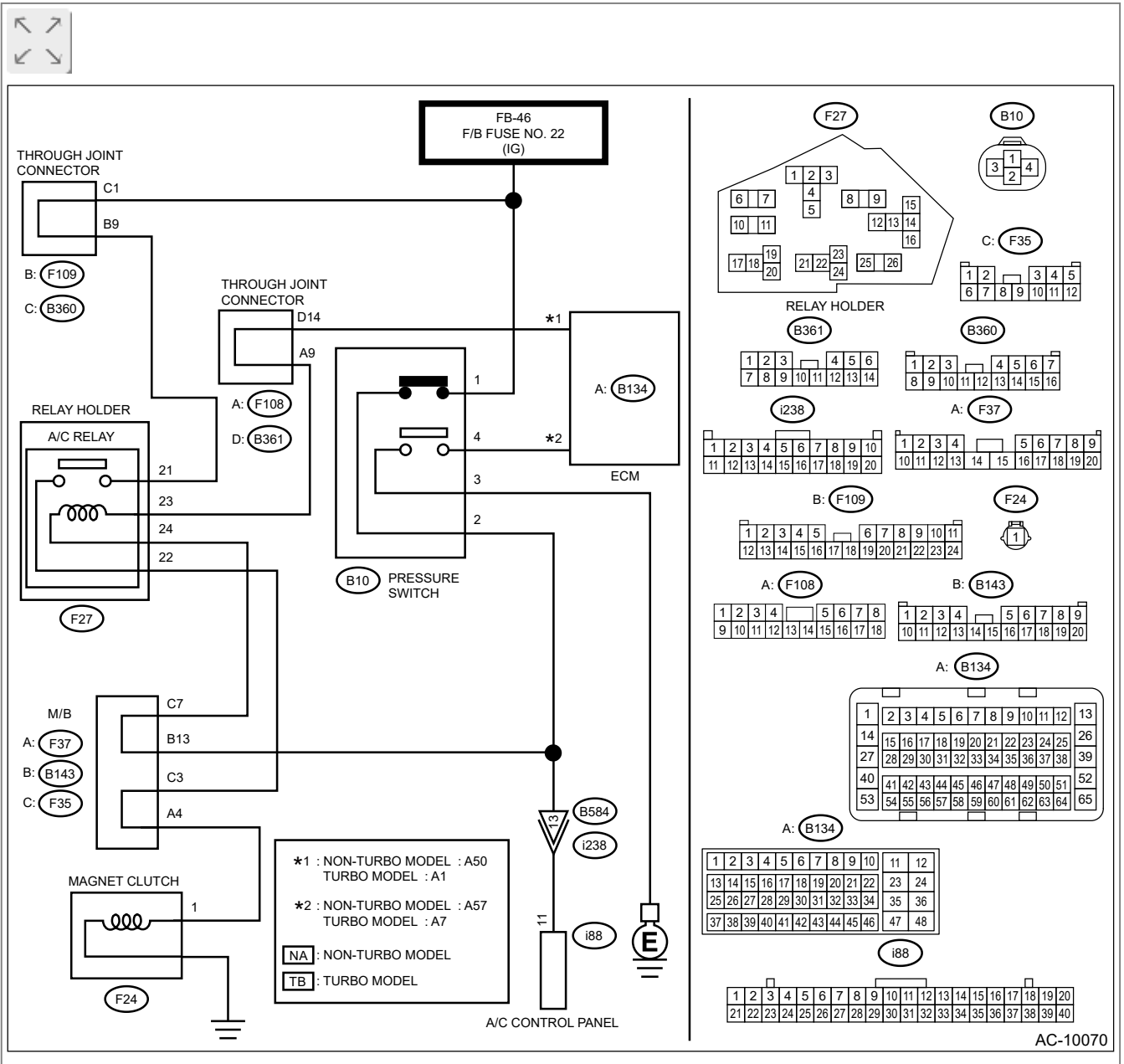
Compressor does not operate after turning the A/C switch to ON and fan dial between LO and HI.

Trouble causes:

Compressor failure

Wiring diagram:

Air conditioning system  Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK A/C CONTROL PANEL.

1. Leave the vehicle under the condition at ambient temperature of 15°C (59°F) or more.
2. Turn the ignition switch to ON.
3. Turn the fan dial to the maximum position.
4. Press the A/C switch.

Is "A/C" displayed on the A/C control panel?

Yes

 Go to 2.

No

Replace the A/C control panel. [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

2. CHECK EVAPORATOR SENSOR.

Using the Subaru Select Monitor, check [Evaporator Temperature] of the data monitor. [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Data Monitor.](#)

Does the data indicate -0.5 degree or more?

Yes

[Go to 4.](#)

No

[Go to 3.](#)

3. CHECK EVAPORATOR SENSOR.

Check the evaporator sensor. [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Evaporator Sensor>INSPECTION.](#)

Is the check result OK?

Yes

[Go to 4.](#)

No

Replace the evaporator sensor. [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Evaporator Sensor>REMOVAL.](#)

4. CHECK PRESSURE SWITCH.

Check the pressure switch connection.

Is the check result OK?


Yes

[Go to 5.](#)

No


Repair the connector.

5. CHECK PRESSURE SWITCH.

Using Subaru Select Monitor, check [A/C Pressure Switch] of the data monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Data Monitor.](#)

Does the data indicate normal?


Yes

 [Go to 10.](#)

No

 [Go to 6.](#)

6. CHECK AMOUNT OF REFRIGERANT PRESSURE.

Check the refrigerant pressure.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Refrigerant Pressure with Manifold Gauge Set>PROCEDURE > CHECK REFRIGERANT GAS PRESSURE.](#)

Is the check result OK?

Yes

 [Go to 7.](#)

No

Perform repair according to refrigerant pressure inspection.

7. CHECK CONNECTOR.

Check poor contact of A/C control panel connector.

Is the check result OK?

Yes

 [Go to 8.](#)

No

Repair the connector.

8. CHECK FUSE.

1. Turn the ignition switch to ON.
2. Remove a fuse in the fuse & relay box.
3. Check the fuse.

Is the fuse normal?

Yes

 [Go to 9.](#)

No

Replace the fuse.

9. CHECK PRESSURE SWITCH SIGNAL.

1. Turn the ignition switch to OFF.
2. Disconnect the A/C control panel connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between A/C control panel connector terminal and chassis ground.

Connector & terminal

(i88) No. 11 (+) — Chassis ground (-):

Is the voltage 10 V or more?



Yes

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

No


- Check for open or short circuit in the harness between fuse and A/C control panel.
- Check for poor contact of pressure switch connector.

10. CHECK CAN COMMUNICATION CIRCUIT.


Using the Subaru Select Monitor, check [A/C Switch] of the data monitor of engine.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Does the data indicate ON?


Yes

 [Go to 12.](#)

No

 [Go to 11.](#)

11. CHECK CAN COMMUNICATION CIRCUIT.

Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

Is the check result OK?

Yes

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

No

Repair it according to DTC of LAN system.

12. CHECK A/C RELAY ON SIGNAL.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector terminal and chassis ground.

Connector & terminal

Non-turbo model


(B134) No. 50 (+) — Chassis ground (–):

Turbo model


(B134) No. 1 (+) — Chassis ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 13.](#)

No

- Check for open or short in the harness between pressure switch and ECM.
- Check poor contact of A/C relay connector.
- Check the A/C relay.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Relay and Fuse>INSPECTION.](#)

13. CHECK A/C RELAY ON SIGNAL.

1. Start the engine.
2. Turn the A/C switch to ON.
3. Turn the temperature control dial at maximum cool position.
4. Measure the voltage between ECM connector terminal and chassis ground.

Connector & terminal

Non-turbo model


(B134) No. 50 (+) — Chassis ground (–):

Turbo model



(B134) No. 1 (+) — Chassis ground (–):

Is the voltage 0 V?

Yes

 [Go to 14.](#)

No

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Engine Control Module \(ECM\).](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)

14. CHECK MAGNET CLUTCH POWER SUPPLY CIRCUIT.


1. Stop the engine.
2. Disconnect the magnet clutch connector.
3. Start the engine.
4. Turn the A/C switch to ON.
5. Turn the temperature control dial at maximum cool position.
6. Measure the voltage between magnet clutch connector terminal and chassis ground.

Connector & terminal


(F24) No. 1 (+) — Chassis ground (—):

Is the voltage 10 V or more?

Yes

Check the magnet clutch.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Compressor>INSPECTION.](#)

No

- Check for open or short circuit in the harness between fuse and magnet clutch.
- Check poor contact of A/C relay connector.
- Check the A/C relay.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Relay and Fuse>INSPECTION.](#)

11. UNABLE TO SWITCH SUCTION VENTS


Trouble symptom:

Even when the FRESH/RECIRC switch is pressed, the inlet opening does not switch to RECIRC → FRESH or FRESH → RECIRC.

Trouble causes:

Intake door actuator failure

1. VISUALLY CHECK FRESH/RECIRC DOOR OPERATION.

1. Remove the glove box.  [Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL.](#)
2. Operate the FRESH/RECIRC switch, and visually check the intake door operation.

Does the intake door operate normally? Is the position between the intake door and intake door case sealed completely?

Yes

The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.


Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

 [Go to 2.](#)

2. CHECK A/C CONTROL PANEL.

1. Turn the ignition switch to ON.
2. Using Subaru Select Monitor, check Fresh/Recircle Air Door Actuator Position Target of the data monitor.
3. Operate the FRESH/RECIRC switch.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Data Monitor.](#)

Does [Fresh/Recircle Air Door Actuator Position Target] indicate 0 ↔ 100?


Yes

 [Go to 3.](#)

No




Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

3. CHECK DTC.

1. Turn the FRESH/RECIRC switch to RECIRC, and leave for 16 seconds or more.
2. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14E9, B14EA or B14EB displayed?


Yes

Perform the diagnosis for the displayed DTC B14E9, B14EA, or B14EB.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E9 INTAKE DOOR ACTUATOR CIRCUIT OPEN.](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14EA INTAKE DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT.](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14EB INTAKE DOOR ACTUATOR STUCK.](#)

No

 [Go to 4.](#)




4. CHECK DTC.

1. Turn the FRESH/RECIRC switch to FRESH, and leave for 16 seconds or more.
2. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14E9, B14EA or B14EB displayed?



Yes

Perform the diagnosis for the displayed DTC B14E9, B14EA, or B14EB.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E9 INTAKE DOOR ACTUATOR CIRCUIT OPEN.](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14EA INTAKE DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT.](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14EB INTAKE DOOR ACTUATOR STUCK.](#)

No

The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

12. UNABLE TO SWITCH VENTS


Trouble symptom:

- Unable to switch blow vents.
- Outlet opening does not switch in the sequence of FACE → B/L → FOOT → F/D after operating the mode switch or mode dial.

Trouble causes:

Mode door actuator failure

1. CHECK A/C CONTROL PANEL.

1. Turn the ignition switch to ON.
2. Using Subaru Select Monitor, check [Mode Door Actuator Position Target] of the data monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Data Monitor.](#)
3. Operate the mode change switch.

Does the value of [Mode Door Actuator Position Target] change along with the operation?


Yes

 [Go to 2.](#)

No



Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

2. CHECK DTC.

1. Set the mode change switch to DEF, and wait for 16 seconds or more.
2. Read the DTC using Subaru Select Monitor.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14E5 or B14E6 displayed?


Yes

Perform the diagnosis for the displayed DTC B14E5 or B14E6.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E5 MODE DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN.](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E6 MODE DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT.](#)

No



 [Go to 3.](#)

3. CHECK DTC.

1. Set the mode change switch to VENT, and wait for 16 seconds or more.
2. Using the Subaru Select Monitor, read DTC of A/C control panel.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B14E5 or B14E6 displayed?

Yes

Perform the diagnosis for the displayed DTC B14E5 or B14E6.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E5 MODE DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN.](#)  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B14E6 MODE DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT.](#)

No

The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

13. ILLUMINATION DOES NOT COME ON OR CANNOT DIM

Trouble symptom:

Even when the lighting switch is operated, the illumination does not come on. Even when the illumination control is operated, the illumination does not dim.

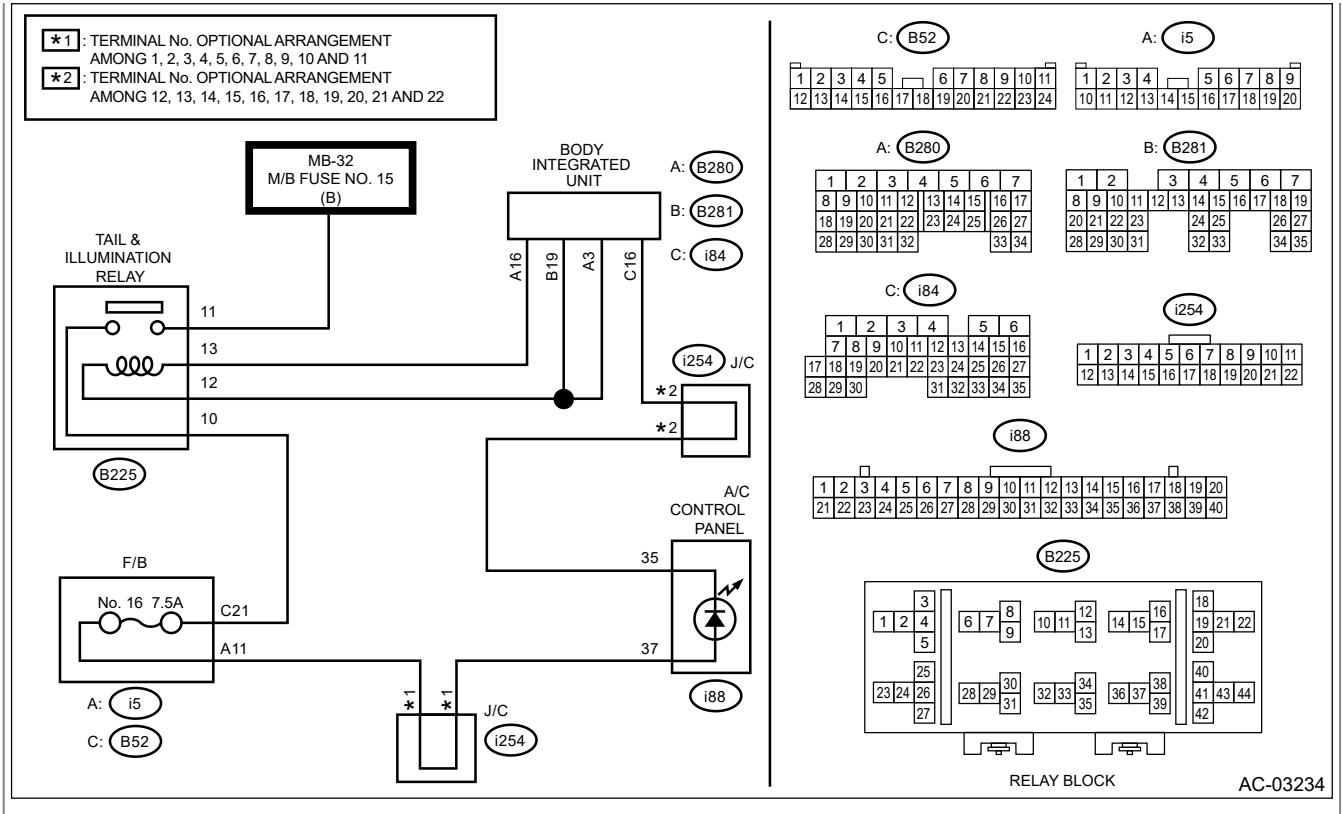
Trouble symptom:

Open circuit in illumination circuit

Wiring diagram:

Clearance Light and Illumination Light System  [Ref. to WIRING SYSTEM>Clearance Light and Illumination Light System>WIRING DIAGRAM.](#)





1. CHECK ILLUMINATION.

Make sure that all illuminations except A/C come on.

Do other illuminations come on?

Yes

[Go to 2.](#)

No

Check the illumination circuit. [Ref. to LIGHTING SYSTEM>Clearance Light and Illumination Light System>INSPECTION.](#)

2. CHECK CONNECTOR.

Check for poor contact of connector.

Is the check result OK?

Yes

[Go to 3.](#)

No

Repair the connector.

3. CHECK HARNESS (OPEN CIRCUIT).



1. Turn the lighting switch to ON.
2. Using a tester, measure the voltage between the A/C control panel connector and chassis ground.

Connector & terminal

(i88) No. 37 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

[Go to 4.](#)

No

Repair or replace the open circuit of harness.

4. CHECK HARNESS (OPEN CIRCUIT).



1. Turn the lighting switch to OFF.
2. Measure the resistance between A/C control panel connector and body integrated unit connector.

Connector & terminal

(i88) No. 35 — (i84) No. 16:

Is the resistance less than 10 Ω ?

Yes

[Go to 5.](#)

No

Repair or replace the open circuit of harness.

5. CHECK A/C CONTROL PANEL UNIT.



Check the A/C control panel. [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)

Is the check result OK?

Yes

A/C control panel illumination circuit is normal.

No









Replace the A/C control panel. [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel>REMOVAL.](#)






AIR CONDITIONER(DIAGNOSTICS) > Diagnostics with Phenomenon

LIST

1. Perform diagnosis according to the diagnosis procedure for the corresponding symptom listed in the symptom table.
2. If there are multiple symptoms, perform the diagnosis in the symptom sequence (1 → 2 → ●●● → 13).

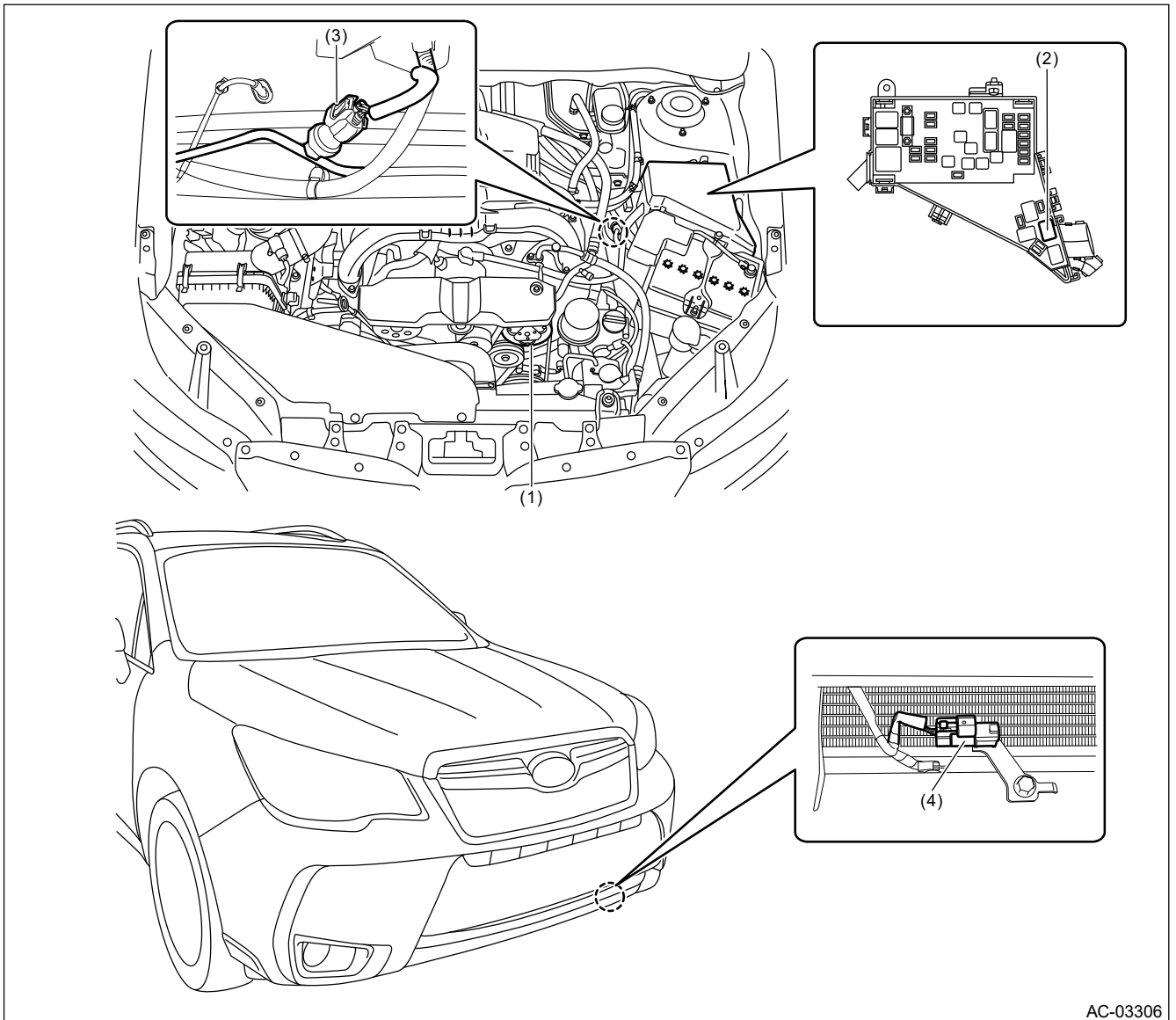
1. SYMPTOM TABLE

Symptoms		Diagnosis procedure
1	Nothing is displayed on the screen or indicators do not illuminate.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > NOTHING IS DISPLAYED ON THE SCREEN OR INDICATORS DO NOT ILLUMINATE.
2	Air conditioner does not stop even when the OFF switch is pressed.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > AIR CONDITIONER DOES NOT STOP EVEN WHEN THE OFF SWITCH IS PRESSED.
3	The windshield glass is not cleared even when the DEF switch is pressed.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE WINDSHIELD GLASS IS NOT CLEARED EVEN WHEN THE DEF SWITCH IS PRESSED.
4	Cold air not emitted.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > COLD AIR NOT EMITTED.
5	Warm air not emitted.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > WARM AIR NOT EMITTED.
6	Compartment temperature is excessively lower than setting temperature.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > COMPARTMENT TEMPERATURE IS EXCESSIVELY LOWER THAN SETTING TEMPERATURE.
7	Compartment temperature is excessively higher than setting temperature.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > COMPARTMENT TEMPERATURE IS EXCESSIVELY HIGHER THAN SETTING TEMPERATURE.
8	Air does not come out, or airflow capacity is insufficient. (Blower motor does not rotate.)	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with

		Phenomenon>INSPECTION > AIR DOES NOT COME OUT, OR AIRFLOW CAPACITY IS INSUFFICIENT.
9	Air goes out of control. (Blower motor rotates at high speed.)	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > AIR GOES OUT OF CONTROL.
10	Cold air does not come out even when the A/C switch is pressed. The glass cannot be defogged. (Compressor does not operate.)	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > COLD AIR DOES NOT COME OUT EVEN WHEN THE A/C SWITCH IS PRESSED. THE GLASS CANNOT BE DEFOGGED. (COMPRESSOR DOES NOT OPERATE.).
11	Unable to switch suction vents.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > UNABLE TO SWITCH SUCTION VENTS.
12	Unable to switch blow vents.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > UNABLE TO SWITCH VENTS.
13	Illumination does not come on, or cannot dim.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > ILLUMINATION DOES NOT COME ON OR CANNOT DIM.

LOCATION

1. OUTSIDE VEHICLE



AC-03306

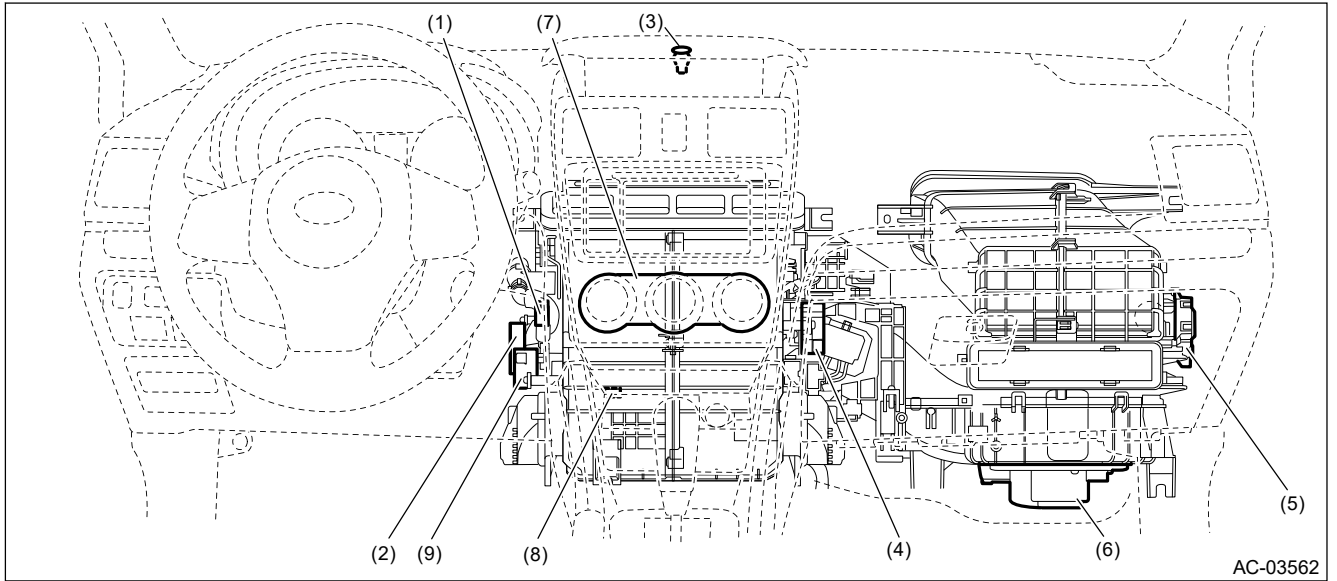
(1) A/C compressor

(3) Pressure switch

(4) Ambient sensor

(2) A/C relay

2. COMPARTMENT



(1) In-vehicle sensor

(4) Air mix door actuator*1 or air mix door actuator RH*2

(7) A/C control panel

(2) Air mix door actuator LH*2

(5) Intake door actuator

(8) Evaporator sensor

(3) Sunload sensor

(6) Blower motor

(9) Mode door actuator

*1: Without left/right independent air conditioning function

*2: With left/right independent air conditioning function

AIR CONDITIONER(DIAGNOSTICS) > General Description

CAUTION

- 1.** Never connect the battery in reverse polarity.
 - Doing so may immediately damage the A/C control panel.
- 2.** Do not disconnect the battery terminals while the engine is running.
 - A large counter electromotive force will be generated in the generator, and this voltage may damage electronic parts such as A/C control panel etc.
- 3.** Before disconnecting the connectors of sensors and the A/C control panel, be sure to turn off the ignition switch.
 - A/C control panel may be damaged.
- 4.** Every A/C-related part is a precision part. Do not drop them.
- 5.** Airbag system harness is routed near the A/C control panel and junction box.

Caution:



- **Do not use electrical test equipment on the airbag system harness and connector.**
- **Be careful not to damage the airbag system harness when servicing the A/C control panel and junction box.**

AIR CONDITIONER(DIAGNOSTICS) > General Description

INSPECTION

Before performing diagnosis, check the following items which might affect the A/C system problems.

1. BATTERY

Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)  [Ref. to STARTING/CHARGING SYSTEMS\(H4DOTC\)>General Description.](#)


Note:

If the battery voltage does not reach the specified value, recharge or replace the battery.

AIR CONDITIONER(DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL







ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	— (Newly adopted tool)	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".








2. GENERAL TOOL









TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.








AIR CONDITIONER(DIAGNOSTICS) > List of Diagnostic Trouble Code (DTC)

LIST

DTC	Item	Content of diagnosis	Note
B1430	IN-VEHICLE (POST EVAPORATOR) TEMPERATURE SENSOR CIRCUIT OPEN	In-vehicle air temperature sensor circuit is open.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1430 IN-VEHICLE (POST EVAPORATOR) TEMPERATURE SENSOR CIRCUIT OPEN.
B1431	IN-VEHICLE (POST EVAPORATOR) TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT	In-vehicle air temperature sensor circuit is shorted.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1431 IN-VEHICLE (POST EVAPORATOR) TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT.
B1432	AMBIENT TEMPERATURE SENSOR CIRCUIT OPEN (AIR-CONDITIONER)	Ambient air temperature sensor circuit is open.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1432 AMBIENT TEMPERATURE SENSOR CIRCUIT OPEN (AIR-CONDITIONER).
B1433	AMBIENT TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT (AIR-CONDITIONER)	Ambient air temperature sensor circuit is shorted.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1433 AMBIENT TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT (AIR-CONDITIONER).
B1434	EVAPORATOR TEMPERATURE SENSOR CIRCUIT OPEN	Post evaporator sensor circuit is open.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1434 EVAPORATOR TEMPERATURE SENSOR CIRCUIT OPEN.
B1435	EVAPORATOR TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT	Post evaporator sensor circuit is shorted.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1435 EVAPORATOR TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT.

B14A1	SUNLOAD SENSOR CIRCUIT LOW/OPEN	Sunload sensor circuit is open.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A1 SUNLOAD SENSOR CIRCUIT LOW/OPEN.
B14A2	SUNLOAD SENSOR CIRCUIT SHORT-CIRCUIT	Sunload sensor circuit is shorted.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A2 SUNLOAD SENSOR CIRCUIT SHORT-CIRCUIT.
B14E1	AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN (DRIVER)	Air mix door actuator stepping motor circuit is open.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14E1 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN (DRIVER).
B14E2	AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT (DRIVER)	Air mix door actuator stepping motor circuit is shorted.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14E2 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT (DRIVER).
B14E3	AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN (PASSENGER)	Air mix door actuator stepping motor circuit is open.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14E3 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN (PASSENGER).
B14E4	AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT (PASSENGER)	Air mix door actuator stepping motor circuit is shorted.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14E4 AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT (PASSENGER).
B14E5	MODE DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN	Mode door actuator stepping motor circuit is open.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14E5 MODE DOOR ACTUATOR STEPPING MOTOR CIRCUIT OPEN.

B14E6	MODE DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT	Mode door actuator stepping motor circuit is shorted.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14E6 MODE DOOR ACTUATOR STEPPING MOTOR CIRCUIT SHORT-CIRCUIT.
B14E9	INTAKE DOOR ACTUATOR CIRCUIT OPEN	Intake door actuator potentiometer circuit is open.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14E9 INTAKE DOOR ACTUATOR CIRCUIT OPEN.
B14EA	INTAKE DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT	Intake door actuator potentiometer circuit is shorted.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14EA INTAKE DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT.
B14EB	INTAKE DOOR ACTUATOR STUCK	Intake door actuator is locked.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14EB INTAKE DOOR ACTUATOR STUCK.
U0073	CAN FAILURE, BUS 'OFF' DETECTION	CAN communication error occurred.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	ECM data receive error occurred.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0101	LOST COMMUNICATION WITH TCM	TCM data receive error occurred.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	VDC data receive error occurred.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH

			VEHICLE DYNAMICS CONTROL MODULE.
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	BIU data receive error occurred.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	METER data receive error occurred.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	An error occurred in ECM data.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".
U0402	INVALID DATA RECEIVED FROM TCM	An error occurred in TCM data.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0402 INVALID DATA RECEIVED FROM TCM.
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	An error occurred in VDC data.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE	An error occurred in BIU data.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE.
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	An error occurred in METER data.	 Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM


		<u>INSTRUMENT PANEL CLUSTER CONTROL MODULE.</u>
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AIR CONDITIONER(DIAGNOSTICS) > Subaru Select Monitor

OPERATION


For detailed operation procedures, refer to "Application help".

Note:

When initialization communication using Select Monitor is impossible, perform diagnosis according to "Diagnostic Procedure Used When Abnormal Communication with Subaru Select Monitor Occurs".  Ref. to AIR [CONDITIONER\(DIAGNOSTICS\)>Diagnostic Procedure for Subaru Select Monitor Communication.](#)

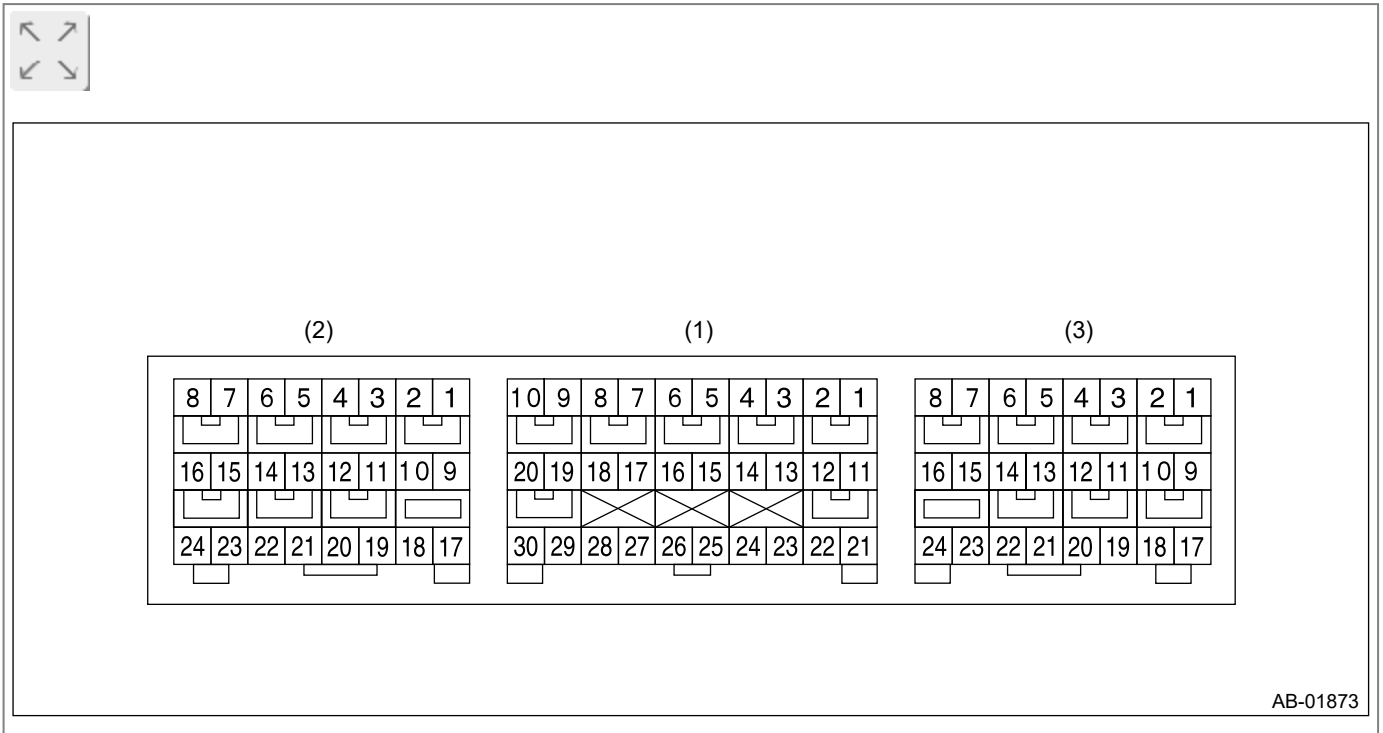
AIRBAG(DIAGNOSTICS) > Airbag Connector

PROCEDURE

For operation procedures, refer to "Airbag Connector" of Airbag System.  [Ref. to AIRBAG SYSTEM>Airbag Connector.](#)

AIRBAG(DIAGNOSTICS) > Airbag Control Module I/O Signal

ELECTRICAL SPECIFICATION



- Terminal numbers in airbag control module connector are shown in the figure.
- The airbag warning light illuminates when the connector is removed from the airbag control module.

Item		Control module terminal No.
Ignition power supply	Dedicated fuse	(1) – 21
Passenger's airbag module level one	+	(1) – 4
	–	(1) – 3
Passenger's airbag module level two	+	(1) – 1
	–	(1) – 2
Driver's airbag module level one	+	(1) – 5
	–	(1) – 6
Driver's airbag module level two	+	(1) – 8
	–	(1) – 7
Driver's knee airbag module	+	(1) – 9
	–	(1) – 10
Batch operation tool		(1) – 16
CAN-H		(1) – 13
CAN-L		(1) – 22
Front sub sensor LH	+	(1) – 30
	–	(1) – 28
Front sub sensor RH	+	(1) – 29

	-	(1) - 27
Ground line (GND)		(1) - 25
		(1) - 26
Passenger's airbag ON indicator		(1) - 23
Passenger's airbag OFF indicator		(1) - 17
Passenger's seat belt warning		(1) - 15
Telematics communication line		(1) - 24
Side airbag sensor LH	+	(2) - 24
Curtain airbag sensor LH		
Front door impact sensor LH	-	(2) - 23
Seat belt pretensioner LH	+	(2) - 5
	-	(2) - 6
Side airbag module LH	+	(2) - 1
	-	(2) - 2
Curtain airbag module LH	+	(2) - 8
	-	(2) - 7
Occupant detection control module	+	(3) - 16
	-	(3) - 24
Side airbag sensor RH	+	(3) - 17
Curtain airbag sensor RH		
Front door impact sensor RH	-	(3) - 18
Side airbag module RH	+	(3) - 8
	-	(3) - 7
Curtain airbag module RH	+	(3) - 1
	-	(3) - 2
Seat belt pretensioner RH	+	(3) - 4
	-	(3) - 3
Lap seat belt pretensioner RH	+	(3) - 13
	-	(3) - 14
Satellite safing sensor	+	(3) - 20
	-	(3) - 19

AIRBAG(DIAGNOSTICS) > Airbag Warning Light Failure

AIRBAG WARNING LIGHT REMAINS OFF

Note:

For the diagnostic procedure, refer to "AIRBAG WARNING LIGHT REMAINS ON". 

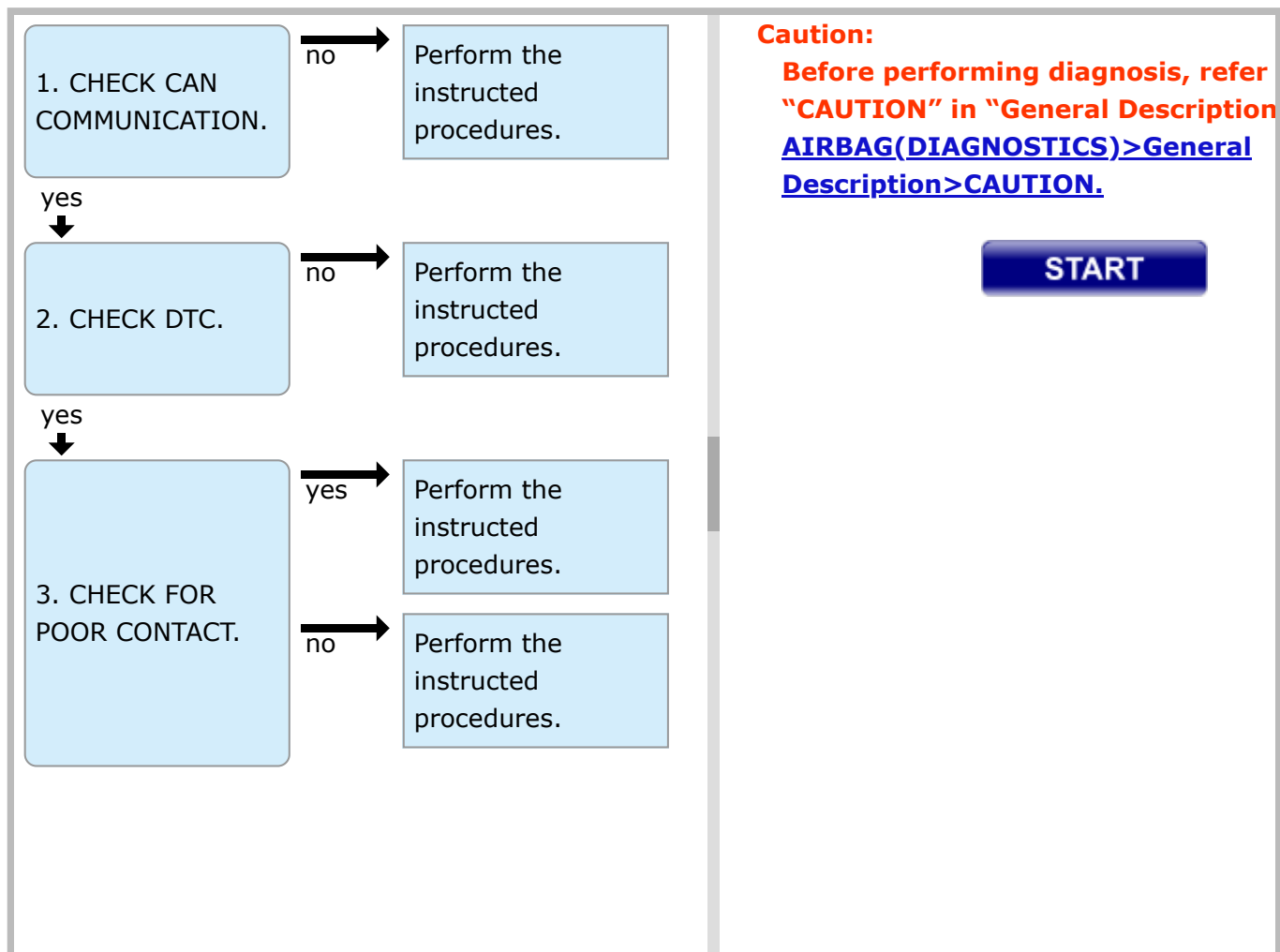
[Ref. to AIRBAG\(DIAGNOSTICS\)>Airbag Warning Light Failure>AIRBAG WARNING LIGHT REMAINS ON.](#)

AIRBAG(DIAGNOSTICS) > Airbag Warning Light Failure

AIRBAG WARNING LIGHT REMAINS ON

CAUTION/NOTE

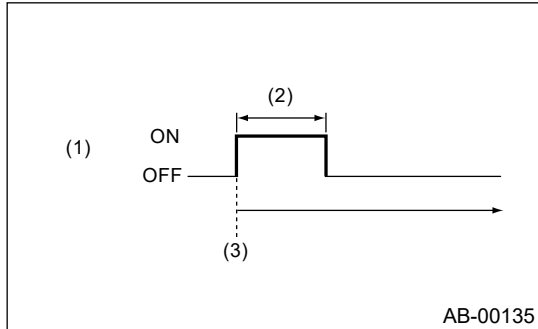
INTRO



AIRBAG(DIAGNOSTICS) > Airbag Warning Light Illumination Pattern

INSPECTION

Turn the ignition switch to ON, and confirm that the airbag warning light remains on for approx. 6 seconds then turns off afterwards.



- (1) Airbag warning light
- (2) Approx. 6 sec.
- (3) Ignition switch ON

AIRBAG(DIAGNOSTICS) > Basic Diagnostic Procedure

PROCEDURE

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description".  [Ref. to AIRBAG\(DIAGNOSTICS\)>General Description>CAUTION.](#)

1. CHECK WARNING LIGHT.


Check whether the airbag warning light in the combination meter is lit.

Does the airbag warning light illuminate?

 [Go to 2.](#)

Perform the diagnosis according to phenomenon of the problem.

2. READ DTC.


1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Read the DTC. (Current malfunction)  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Note:

If the communication function of the Subaru Select Monitor cannot be executed properly, check the communication circuit.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Subaru Select Monitor>INSPECTION.](#)


5. Record all DTCs, time stamp and freeze frame data.

Note:




For time stamp, refer to "LAN SYSTEM".  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>General Description>CAUTION > TIME STAMP.](#)

Are any DTCs displayed?

 [Go to 3.](#)

Refer to "Airbag Warning Light Failure".  [Ref. to AIRBAG\(DIAGNOSTICS\)>Airbag Warning Light Failure.](#)

3. PERFORM DIAGNOSIS.

- 1.** Determine the possible cause from "List of Diagnostic Trouble Code (DTC)".  [Ref. to AIRBAG\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)
- 2.** Inspect using "Diagnostic Procedure with Diagnostic Trouble Code (DTC)".
- 3.** Repair the trouble cause.
- 4.** Perform the Clear Memory Mode.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Clear memory.](#)
- 5.** Perform the Inspection Mode.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Inspection Mode.](#)
- 6.** Read any other DTCs displayed.

Are any DTCs displayed?

Yes

Perform the procedure 1) to 5) in step 3.

No

Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Check List for Interview

CHECK



Customer's Name		Inspector's Name	
Date Vehicle Brought in	/ /	Registration No.	
Odometer reading	km miles	Chassis number	
Date Problem Occurred	/ /	Registration Year	/ /
Weather	<input type="checkbox"/> Fine <input type="checkbox"/> Cloudy <input type="checkbox"/> Rainy <input type="checkbox"/> Snowy <input type="checkbox"/> Others:		
Temperature	°C (°F)		
Road Condition	<input type="checkbox"/> Flat road <input type="checkbox"/> Uphill <input type="checkbox"/> Downhill <input type="checkbox"/> Gravel road <input type="checkbox"/> Others:		
Vehicle Operation	<input type="checkbox"/> Starting <input type="checkbox"/> Idling <input type="checkbox"/> Driving <ul style="list-style-type: none"> <input type="checkbox"/> Constant speed <input type="checkbox"/> Accelerating <input type="checkbox"/> Decelerating <input type="checkbox"/> Turning <input type="checkbox"/> Others: 		
Details of Problem			
Airbag Warning Light Operation	<input type="checkbox"/> Normal (After turning the ignition switch to ON, lit for approximately 6 seconds and goes off.) <input type="checkbox"/> Remains ON <input type="checkbox"/> Remains OFF		
DTC output	<input type="checkbox"/> OK code <input type="checkbox"/> DTC: (Code:)		

AIRBAG(DIAGNOSTICS) > Clear memory

OPERATION

- 1.** On [Start] display, select [Diagnosis].
- 2.** On [Vehicle selection] display, input the target vehicle information and select [OK].
- 3.** On [Main Menu] display, select [Each System].
- 4.** On [Select System] display, select [Airbag], and then select [Enter].
- 5.** On [Select Function] display, select [DTC].
- 6.** On [DTC] display, select [Clear memory].

Note:

- **For detailed operation procedures, refer to “Application help”.**
- **Clear the DTC stored in the airbag control module after repairing the airbag system.**

AIRBAG(DIAGNOSTICS) > Data Monitor

LIST

Item	Display	Note
Trip Count [count]	—	—
Count	—	—
Time Count [msec]	—	—
Belt Buckle Switch RH	Unbelted / Belted	[Belted] when passenger's seat belt is fastened [Unbelted] when passenger's seat belt is not fastened
Passenger Occupant Status	Occupied / Empty or CRS	[Occupied] when the occupant is present [Empty or CRS] when the seat is unoccupied or when child restraint seat is installed Caution: When checking the operating status, be careful of the followings. <ul style="list-style-type: none"> • When the seat is unoccupied: Do not place anything on the seat. • Child restraint seat: Install the seat according to its instruction manual. • When the seat is occupied: Someone who weighs at least approx. 70 kg (155 lb) must be seated during the check.
Passenger Airbag Status	ON/OFF	"ON" when the passenger occupant status is Occupied "OFF" when Empty or CRS is displayed

AIRBAG(DIAGNOSTICS) > Data Monitor

OPERATION

Check the operating condition of each sensor in the event of malfunction in the seat belt buckle switch, or when the seat belt buckle switch has been replaced.

- 1.** On [Start] display, select [Diagnosis].
- 2.** On [Vehicle selection] display, input the target vehicle information and select [OK].
- 3.** On [Main Menu] display, select [Each System].
- 4.** On [Select System] display, select [Airbag], and then select [Enter].
- 5.** On [Select Function] display, select [Data Monitor].

Note:

For detailed operation procedures, refer to “Application help”.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1000 AIRBAG ECU MALFUNCTION

CAUTION/NOTE

INTRO

1. CHECK DTC.

yes →

Perform the instructed procedures.

no →

Perform the instructed procedures.

Caution:

Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1003 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1103, refer to DTC B1000.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1000 AIRBAG ECU MALFUNCTION.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1105 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1105, refer to DTC B1000.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1000 AIRBAG ECU MALFUNCTION.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1106 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1106, refer to DTC B1000.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1000 AIRBAG ECU MALFUNCTION.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1115 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1115, refer to DTC B1000.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1000 AIRBAG ECU MALFUNCTION.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1116 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1116, refer to DTC B1000.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1000 AIRBAG ECU MALFUNCTION.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1120 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1120, refer to DTC B1000.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1000 AIRBAG ECU MALFUNCTION.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1121 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1121, refer to DTC B1000.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1121 AIRBAG ECU MALFUNCTION.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1125 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1125, refer to DTC B1000.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1000 AIRBAG ECU MALFUNCTION.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1126 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1126, refer to DTC B1000.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1000 AIRBAG ECU MALFUNCTION.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1145 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1145, refer to DTC B1000.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1000 AIRBAG ECU MALFUNCTION.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1146 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1146, refer to DTC B1000.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1000 AIRBAG ECU MALFUNCTION.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1170 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1170, refer to DTC B1000.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1000 AIRBAG ECU MALFUNCTION.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1185 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1185, refer to DTC B1000.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1000 AIRBAG ECU MALFUNCTION.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1195 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1195, refer to DTC B1000.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1000 AIRBAG ECU MALFUNCTION.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1196 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1196, refer to DTC B1000.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1000 AIRBAG ECU MALFUNCTION.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1199 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1199, refer to DTC B1000.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1000 AIRBAG ECU MALFUNCTION.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)




DTC B11E0 ROLLOVER DEPLOYMENT HISTORY

Diagnosis start condition:

When the ignition voltage is 10 V — 16 V

DTC detecting condition:

This DTC is indicated when the curtain airbag module and the seat belt pretensioner are deployed. Once this DTC is displayed, the memory cannot be cleared. Replace the following parts.

- Airbag control module  [Ref. to AIRBAG SYSTEM>Airbag Control Module.](#)
- Curtain airbag module on both sides  [Ref. to AIRBAG SYSTEM>Curtain Airbag Module.](#)
- Front outer seat belt with pretensioner of both sides  [Ref. to SEAT BELT SYSTEM>Front Seat Belt.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B11F2 FRONT IMPACT DEPLOYMENT











Diagnosis start condition:

When the ignition voltage is 10 V – 16 V

DTC detecting condition:

This DTC is indicated when the front airbag module and the pretensioner are deployed.

Once this DTC is displayed, the memory cannot be cleared. Therefore replace the following parts.

- Airbag control module  [Ref. to AIRBAG SYSTEM>Airbag Control Module.](#)
- Driver's airbag module  [Ref. to AIRBAG SYSTEM>Driver's Airbag Module.](#)
- Passenger's airbag module (if deployed)  [Ref. to AIRBAG SYSTEM>Passenger's Airbag Module.](#)
- Driver's knee airbag module  [Ref. to AIRBAG SYSTEM>Knee Airbag Module.](#)
- Front sub sensor of both sides  [Ref. to AIRBAG SYSTEM>Front Sub Sensor.](#)
- Front outer seat belt with pretensioner of both sides  [Ref. to SEAT BELT SYSTEM>Front Seat Belt.](#)
- Steering roll connector  [Ref. to AIRBAG SYSTEM>Roll Connector.](#)
- Occupant detection system (passenger's seat cushion & frame assembly)  [Ref. to SEATS>Front Seat.](#)
- Side airbag module on both sides (when activated)  [Ref. to AIRBAG SYSTEM>Side Airbag Sensor.](#)
- Curtain airbag module on both sides (when activated)  [Ref. to AIRBAG SYSTEM>Curtain Airbag Module.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B11F3 FRONT IMPACT DEPLOYMENT


Note:

For details on DTC B11F3, refer to DTC B11F2.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B11F2 FRONT IMPACT DEPLOYMENT.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B11F4 FRONT IMPACT DEPLOYMENT

Note:

For details on DTC B11F4, refer to DTC B11F2.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B11F2 FRONT IMPACT DEPLOYMENT.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B11F5 FRONT IMPACT DEPLOYMENT

Note:

For details on DTC B11F5, refer to DTC B11F2.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B11F2 FRONT IMPACT DEPLOYMENT.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B11F7 SIDE IMPACT DEPLOYMENT









Diagnosis start condition:

When the ignition voltage is 10 V – 16 V

DTC detecting condition:

This DTC is displayed when the side airbag module and curtain airbag module are deployed.


Once this DTC is displayed, the memory cannot be cleared. Replace the following parts.

- Airbag control module  [Ref. to AIRBAG SYSTEM>Airbag Control Module.](#)
- Side airbag module (operating side)  [Ref. to AIRBAG SYSTEM>Side Airbag Module.](#)
- Side airbag sensor (operating side)  [Ref. to AIRBAG SYSTEM>Side Airbag Sensor.](#)
- Curtain airbag module (operating side)  [Ref. to AIRBAG SYSTEM>Curtain Airbag Module.](#)
- Curtain airbag sensor (operating side)  [Ref. to AIRBAG SYSTEM>Curtain Airbag Sensor.](#)
- Satellite safing sensor  [Ref. to AIRBAG SYSTEM>Satellite Safing Sensor.](#)
- Front door impact sensor (operating side)  [Ref. to AIRBAG SYSTEM>Front Door Impact Sensor.](#)
- Front outer seat belt with pretensioner (operating side)  [Ref. to SEAT BELT SYSTEM>Front Seat Belt.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B11F8 SIDE IMPACT DEPLOYMENT

Note:

For details on DTC B11F8, refer to DTC B11F7.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B11F7 SIDE IMPACT DEPLOYMENT.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B11F9 SIDE IMPACT DEPLOYMENT


Note:

For details on DTC B11F9, refer to DTC B11F7.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B11F7 SIDE IMPACT DEPLOYMENT.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B11FA SIDE IMPACT DEPLOYMENT

Note:

For details on DTC B11FA, refer to DTC B11F7.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B11F7 SIDE IMPACT DEPLOYMENT.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B11FB SIDE IMPACT DEPLOYMENT

Note:

For details on DTC B11FB, refer to DTC B11F7.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B11FB SIDE IMPACT DEPLOYMENT.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B11FC SIDE IMPACT DEPLOYMENT

Note:

For details on DTC B11FC, refer to DTC B11F7.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B11F7 SIDE IMPACT DEPLOYMENT.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1610 FRONT SUB SENSOR RH FAILURE

DIAGNOSIS START CONDITION:

When the ignition voltage is 10 V — 16 V

DTC DETECTING CONDITION:

Front sub sensor RH is faulty.

If DTC B1610 is displayed, the circuit within the front sub sensor RH is faulty.

Replace the front sub sensor RH.  [Ref. to AIRBAG SYSTEM>Front Sub Sensor.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1612 FRONT SUB SENSOR RH LOST COMMUNICATION

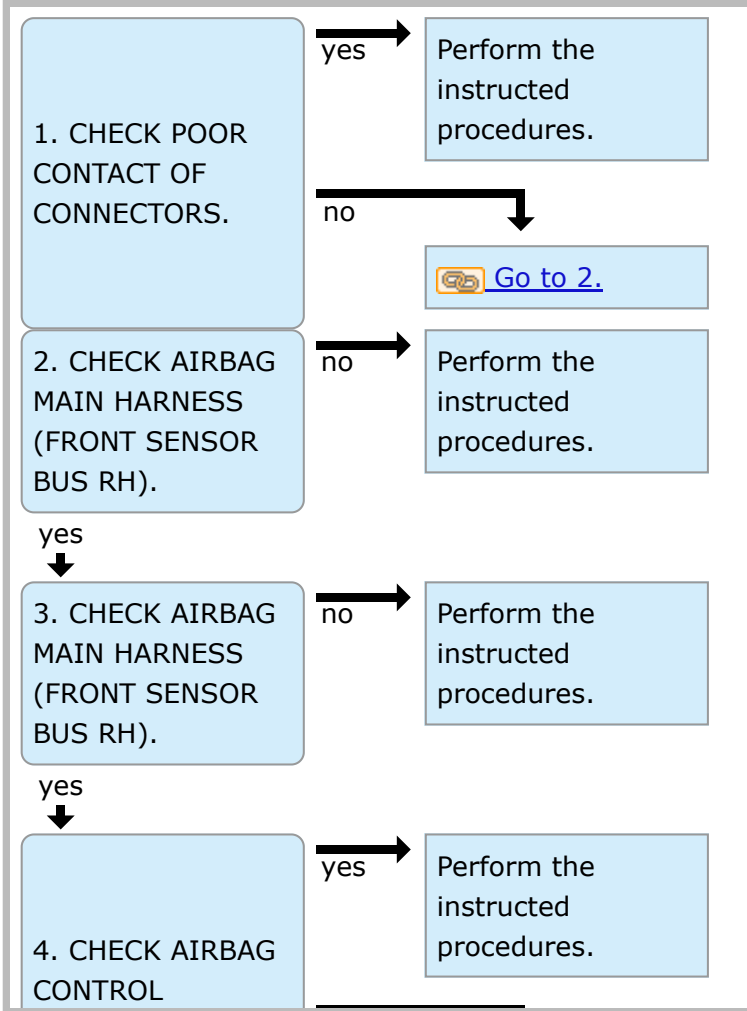
Note:

For details on DTC B1612, refer to DTC B1613.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1613 FRONT SUB SENSOR RH INITIALIZATION ERROR.](#)

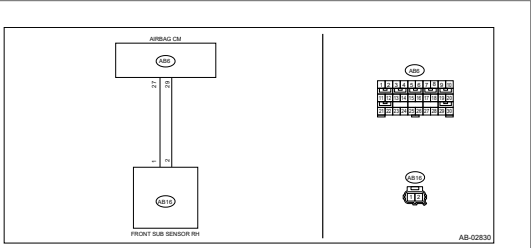
AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1613 FRONT SUB SENSOR RH INITIALIZATION ERROR

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION."

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1615 FRONT SUB SENSOR LH FAILURE

DIAGNOSIS START CONDITION:

When the ignition voltage is 10 V — 16 V

DTC DETECTING CONDITION:

Front sub sensor LH is faulty.

If DTC B1615 is displayed, the circuit within the front sub sensor LH is faulty.

Replace the front sub sensor LH.  [Ref. to AIRBAG SYSTEM>Front Sub Sensor.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC B1617 FRONT SUB SENSOR LH LOST COMMUNICATION

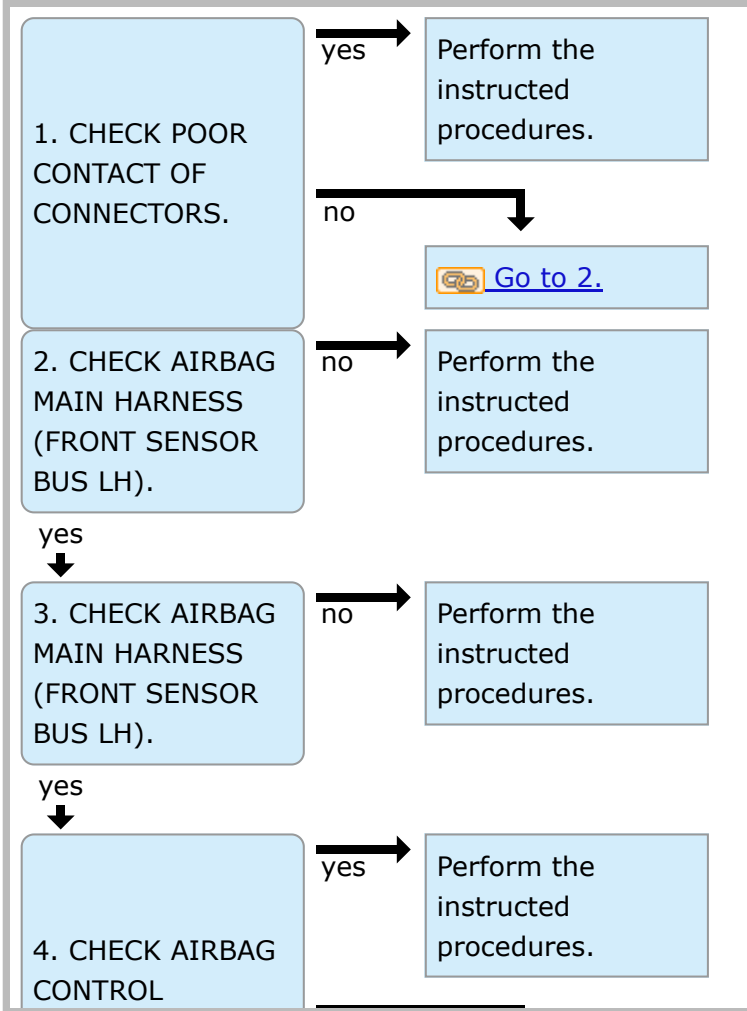
Note:

For details on DTC B1617, refer to DTC B1618.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1618 FRONT SUB SENSOR LH INITIALIZATION ERROR.](#)

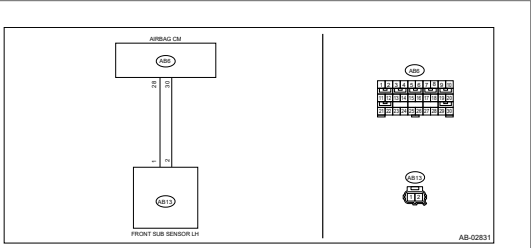
AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1618 FRONT SUB SENSOR LH INITIALIZATION ERROR

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer **"CAUTION"** in **"General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.**

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B161A LOST COMMUNICATION WITH FRONT SATELLITE SENSOR BUS

[CAUTION/NOTE](#) [INTRO](#)

1. CHECK POOR CONTACT OF CONNECTORS.

yes → Perform the instructed procedures.

no → [Go to 2.](#)

2. CHECK AIRBAG MAIN HARNESS (FRONT SENSOR BUS LH).

no → Perform the instructed procedures.

yes ↓


3. CHECK AIRBAG MAIN HARNESS (FRONT SENSOR BUS LH).

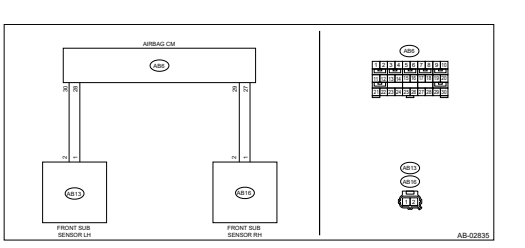
no → Perform the instructed procedures.

yes ↓

4. CHECK AIRBAG MAIN HARNESS (FRONT SENSOR BUS RH).

no → Perform the instructed procedures.

Wiring diagram:
Airbag system  [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer "CAUTION" in "General Description [AIRBAG\(DIAGNOSTICS\)>General Description>CAUTION.](#)

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1620 SIDE AIRBAG SENSOR RH FAILURE

Diagnosis start condition:

When the ignition voltage is 10 V — 16 V

DTC detecting condition:

Side airbag sensor RH is faulty.

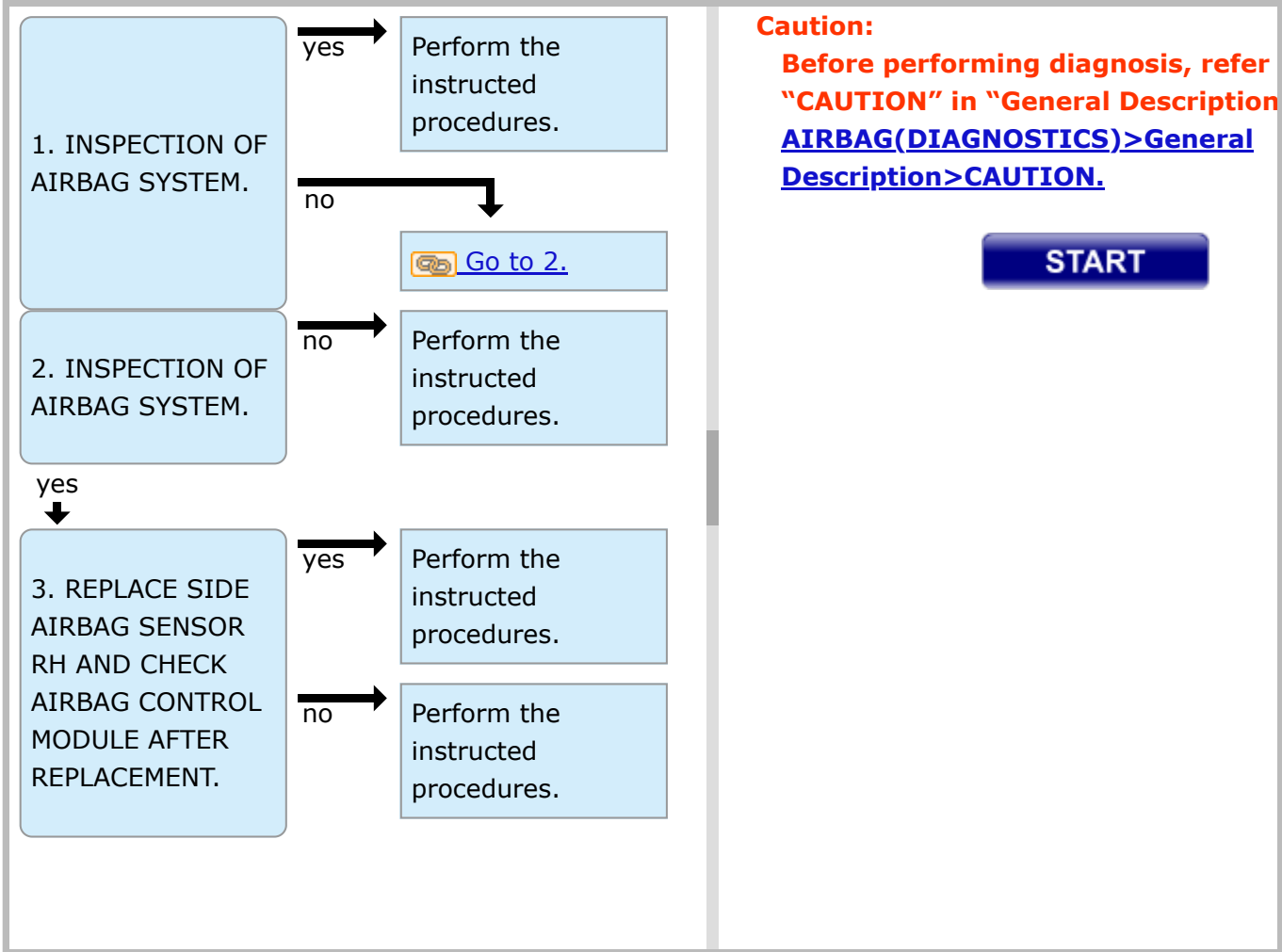
When DTC B1620 is displayed, the circuit within the side airbag sensor RH is faulty.

Replace the side airbag sensor RH.  [Ref. to AIRBAG SYSTEM>Side Airbag Sensor.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1622 SIDE AIRBAG SENSOR RH LOST COMMUNICATION

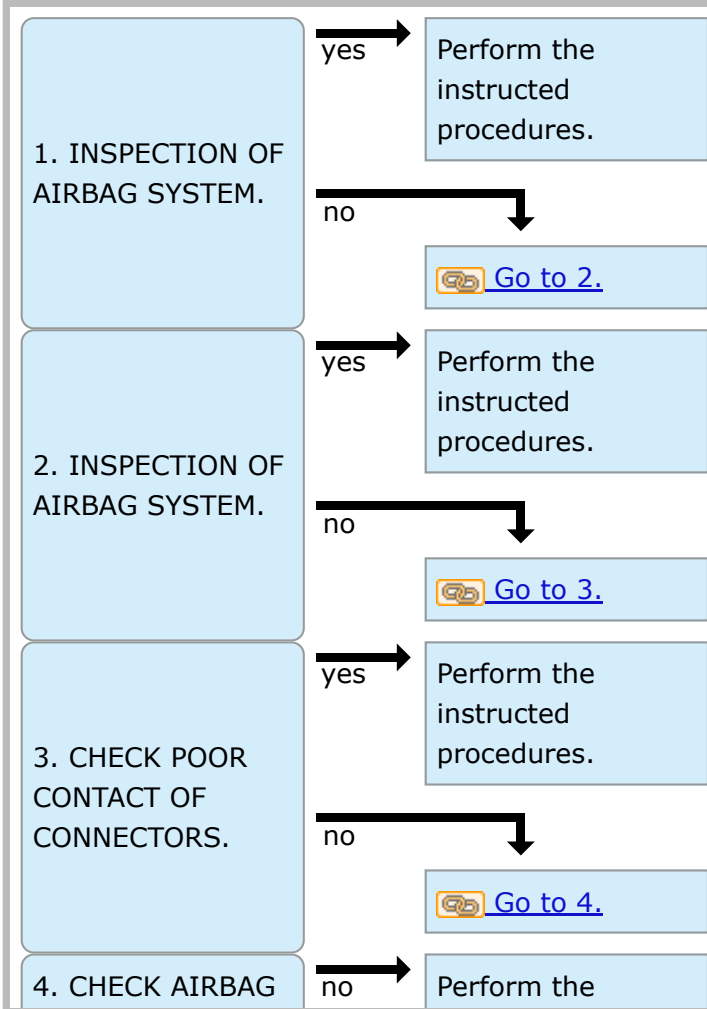
[CAUTION/NOTE](#) [INTRO](#)



AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

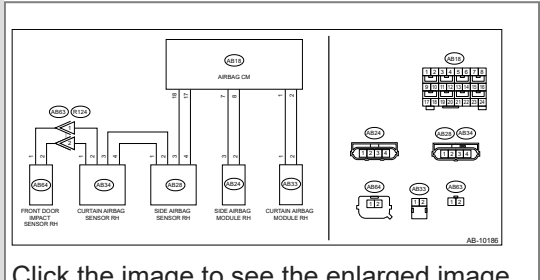
DTC B1623 SIDE AIRBAG SENSOR RH INITIALIZATION ERROR

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:

Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1625 SIDE AIRBAG SENSOR LH FAILURE

DIAGNOSIS START CONDITION:

When the ignition voltage is 10 V — 16 V

DTC DETECTING CONDITION:

Side airbag sensor LH is faulty.

When DTC B1625 is displayed, the circuit within the side airbag sensor LH is faulty.

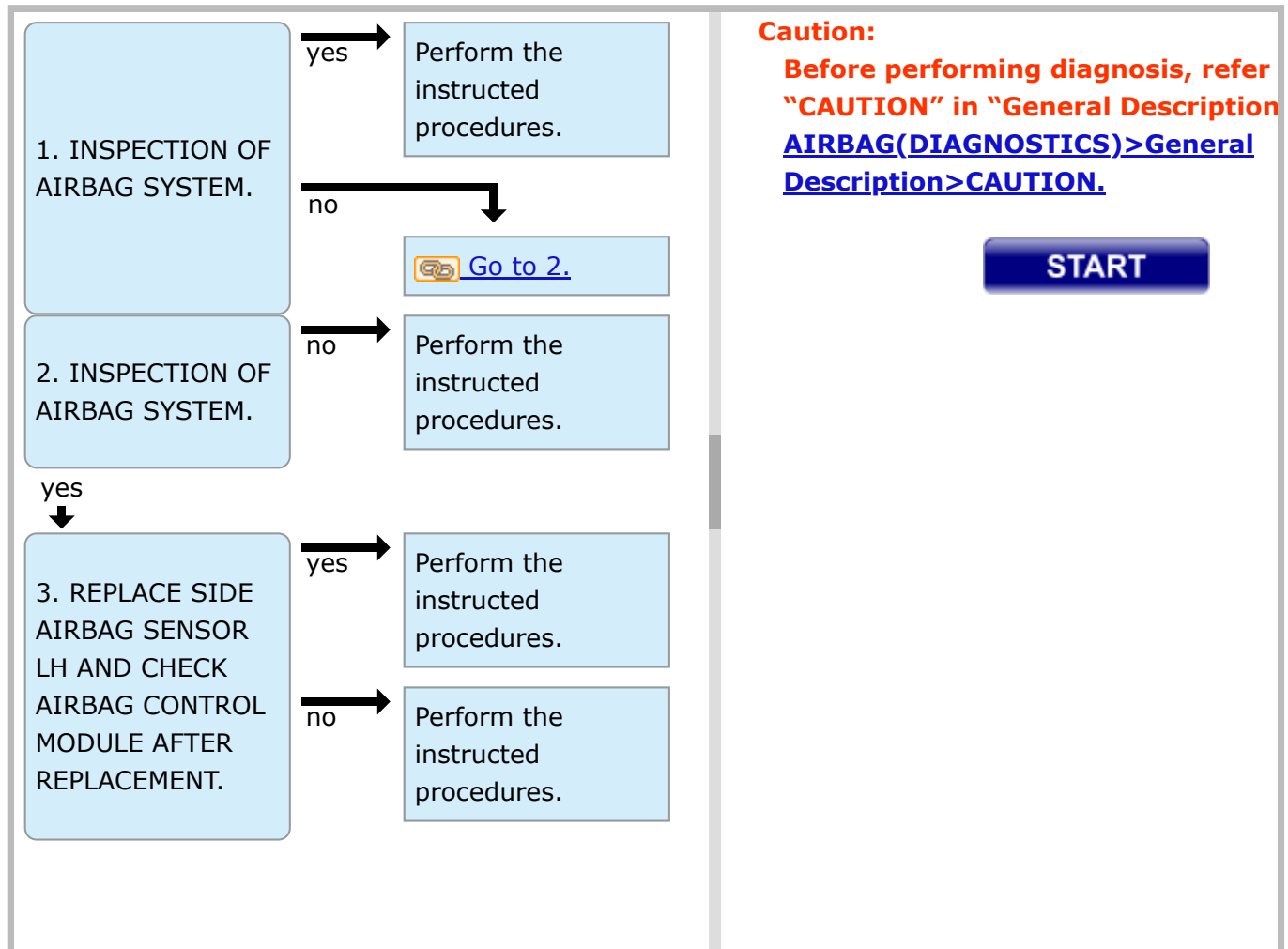
Replace the side airbag sensor LH.  [Ref. to AIRBAG SYSTEM>Side Airbag Sensor.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1627 SIDE AIRBAG SENSOR LH LOST COMMUNICATION

CAUTION/NOTE

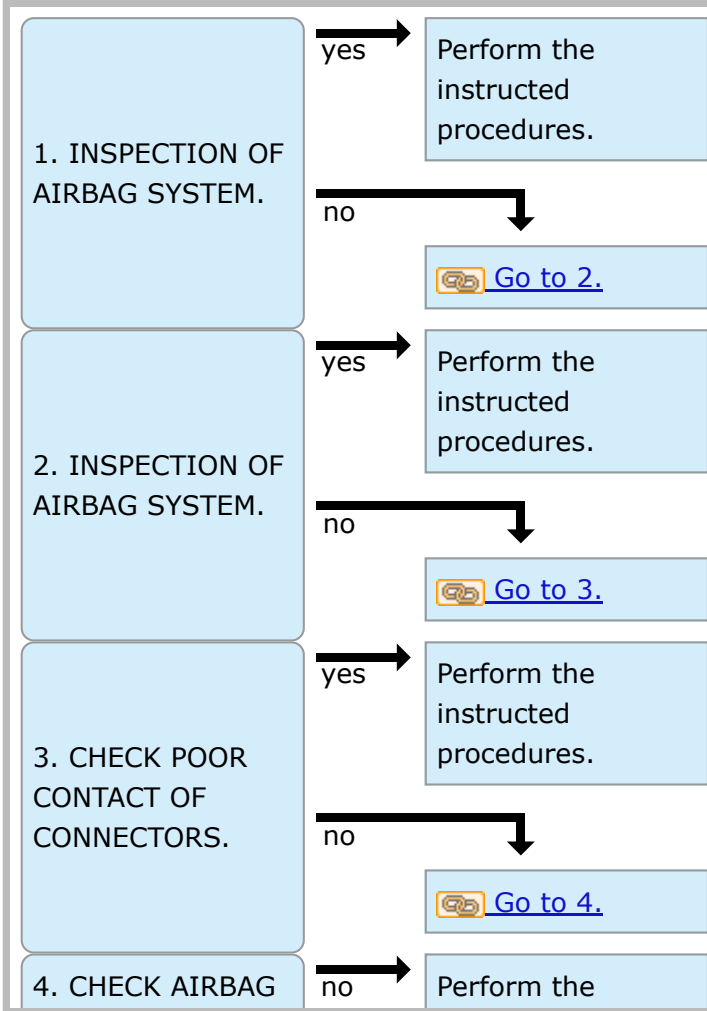
INTRO



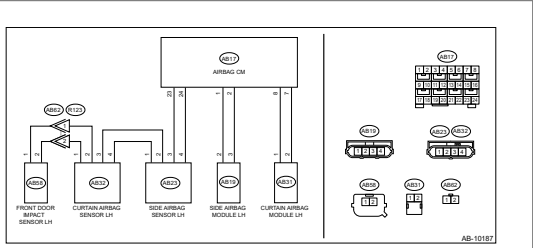
AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1628 SIDE AIRBAG SENSOR LH INITIALIZATION ERROR

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer **"CAUTION"** in **"General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.**

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1630 CURTAIN AIRBAG SENSOR RH FAILURE

DIAGNOSIS START CONDITION:

When the ignition voltage is 10 V — 16 V

DTC DETECTING CONDITION:

Curtain airbag sensor RH is faulty.

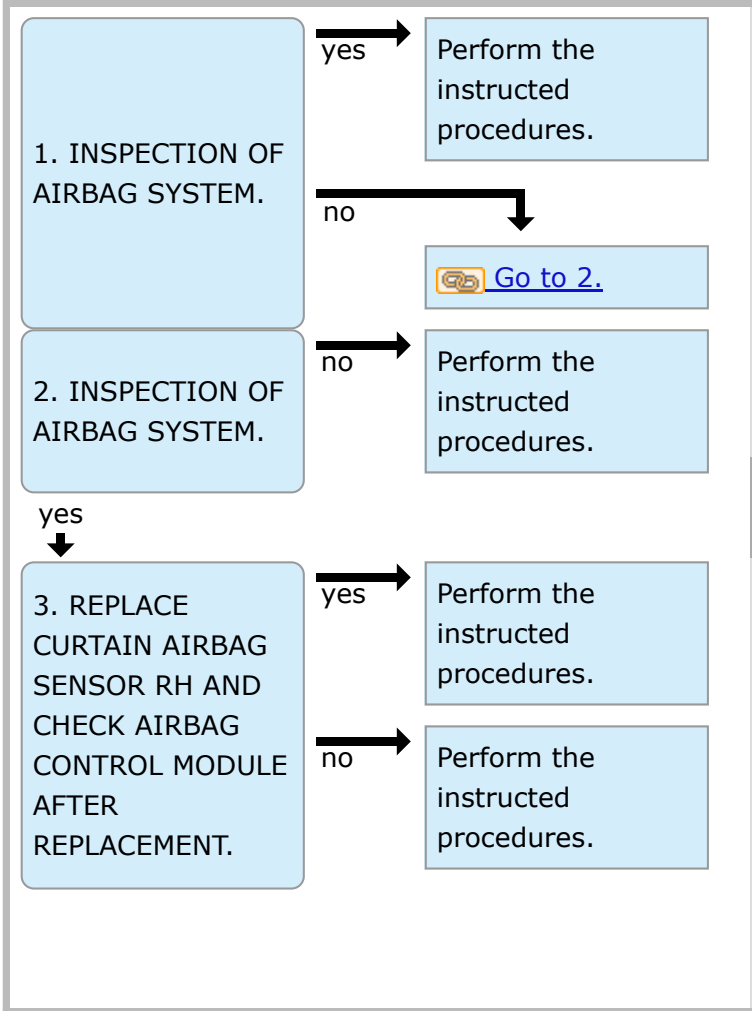
If DTC B1630 is displayed, the circuit within the curtain airbag sensor RH is faulty.

Replace the curtain airbag sensor RH.  [Ref. to AIRBAG SYSTEM>Curtain Airbag Sensor.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1632 CURTAIN AIRBAG SENSOR RH LOST COMMUNICATION

[CAUTION/NOTE](#) [INTRO](#)



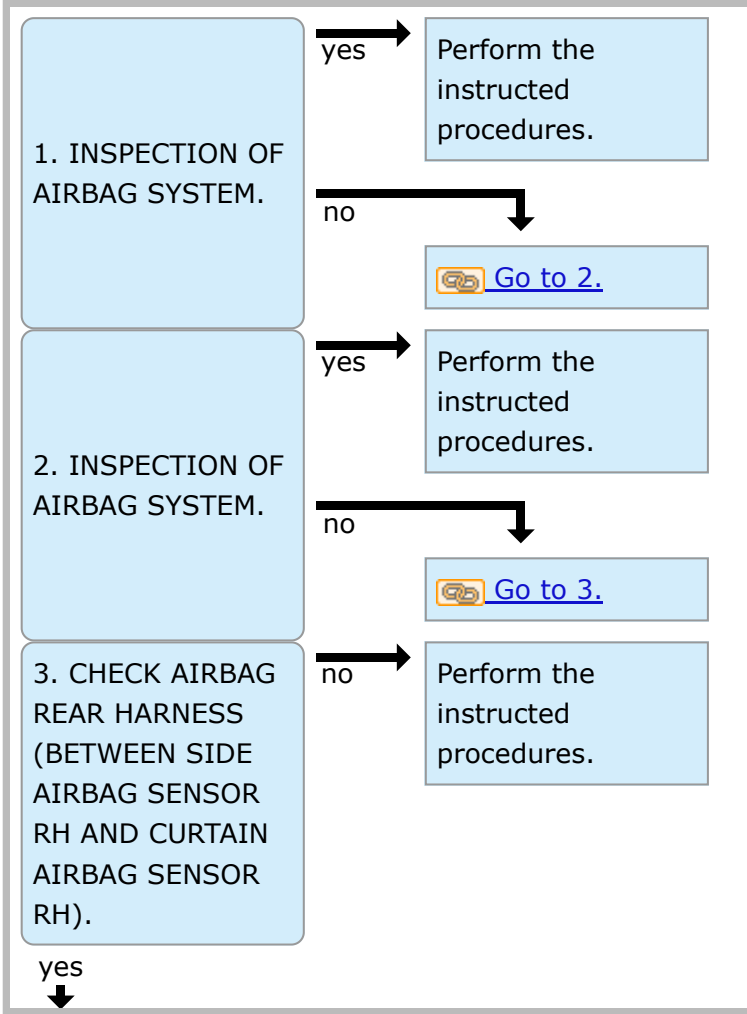
Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION."

START

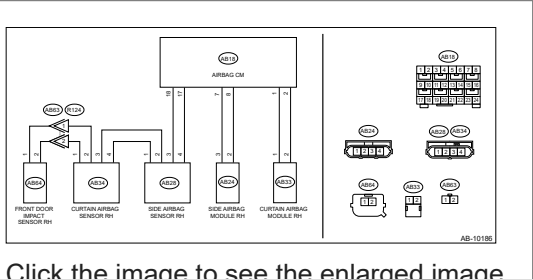
AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1633 CURTAIN AIRBAG SENSOR RH INITIALIZATION ERROR

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer **"CAUTION"** in **"General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.**

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1635 CURTAIN AIRBAG SENSOR LH FAILURE

DIAGNOSIS START CONDITION:

When the ignition voltage is 10 V — 16 V

DTC DETECTING CONDITION:

Curtain airbag sensor LH is faulty.

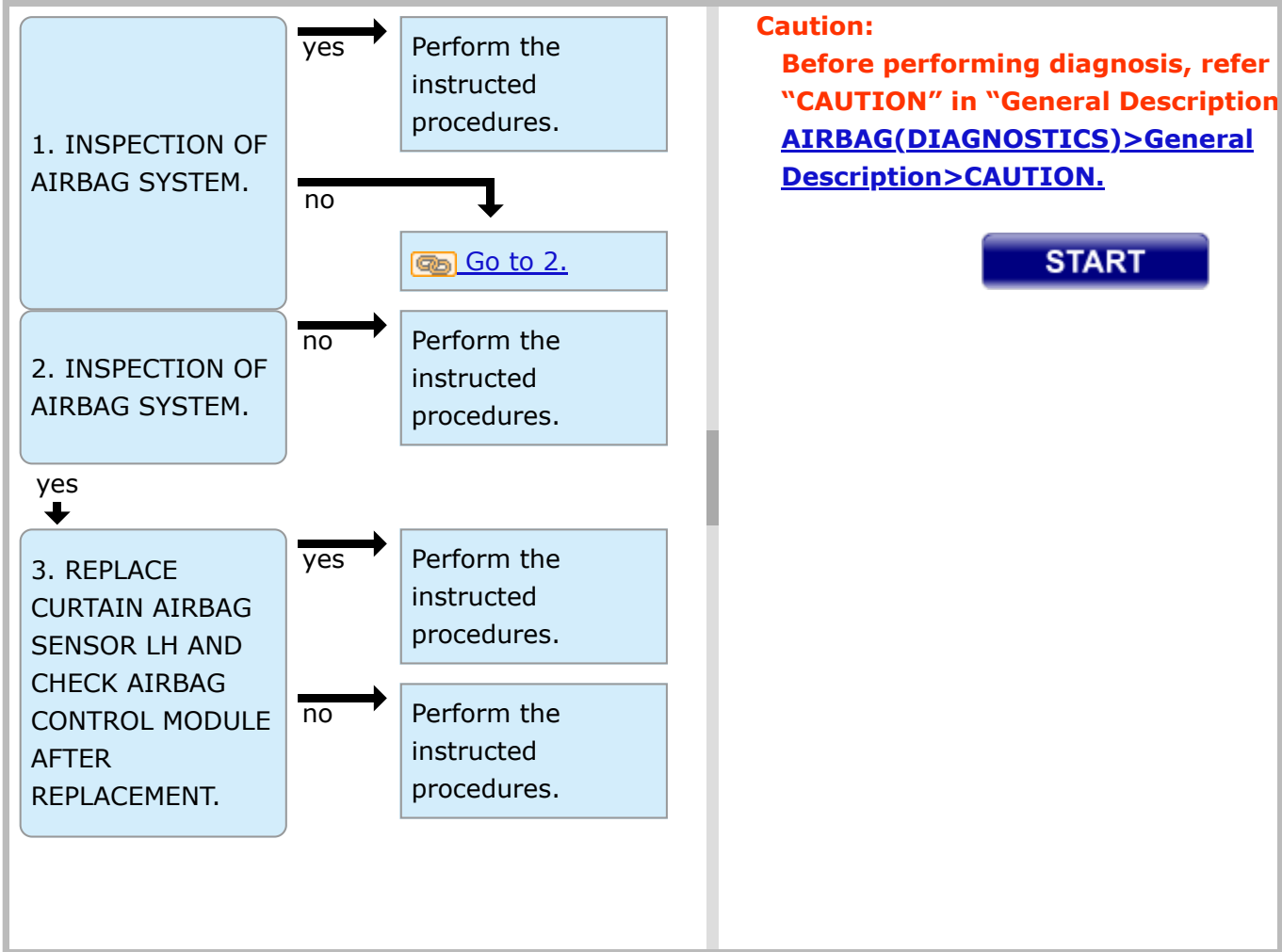
If DTC B1635 is displayed, the circuit within the curtain airbag sensor LH is faulty.

Replace the curtain airbag sensor LH.  [Ref. to AIRBAG SYSTEM>Curtain Airbag Sensor.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1637 CURTAIN AIRBAG SENSOR LH LOST COMMUNICATION

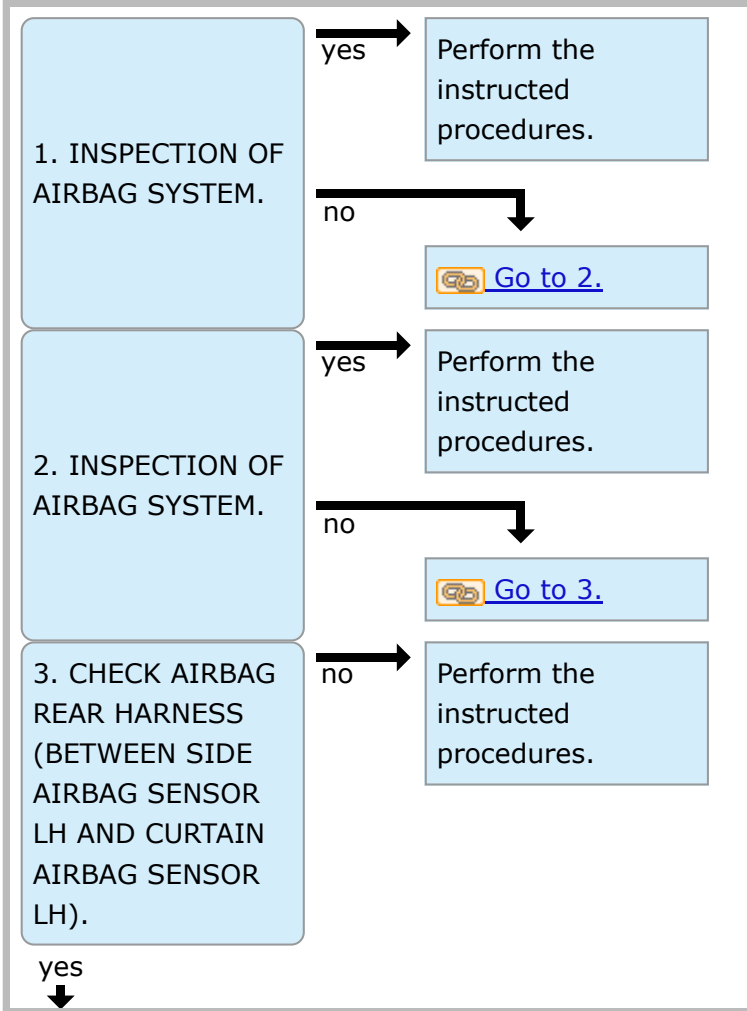
[CAUTION/NOTE](#) [INTRO](#)



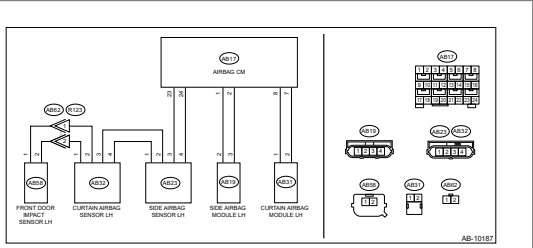
AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1638 CURTAIN AIRBAG SENSOR LH INITIALIZATION ERROR

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer **"CAUTION"** in **"General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.**

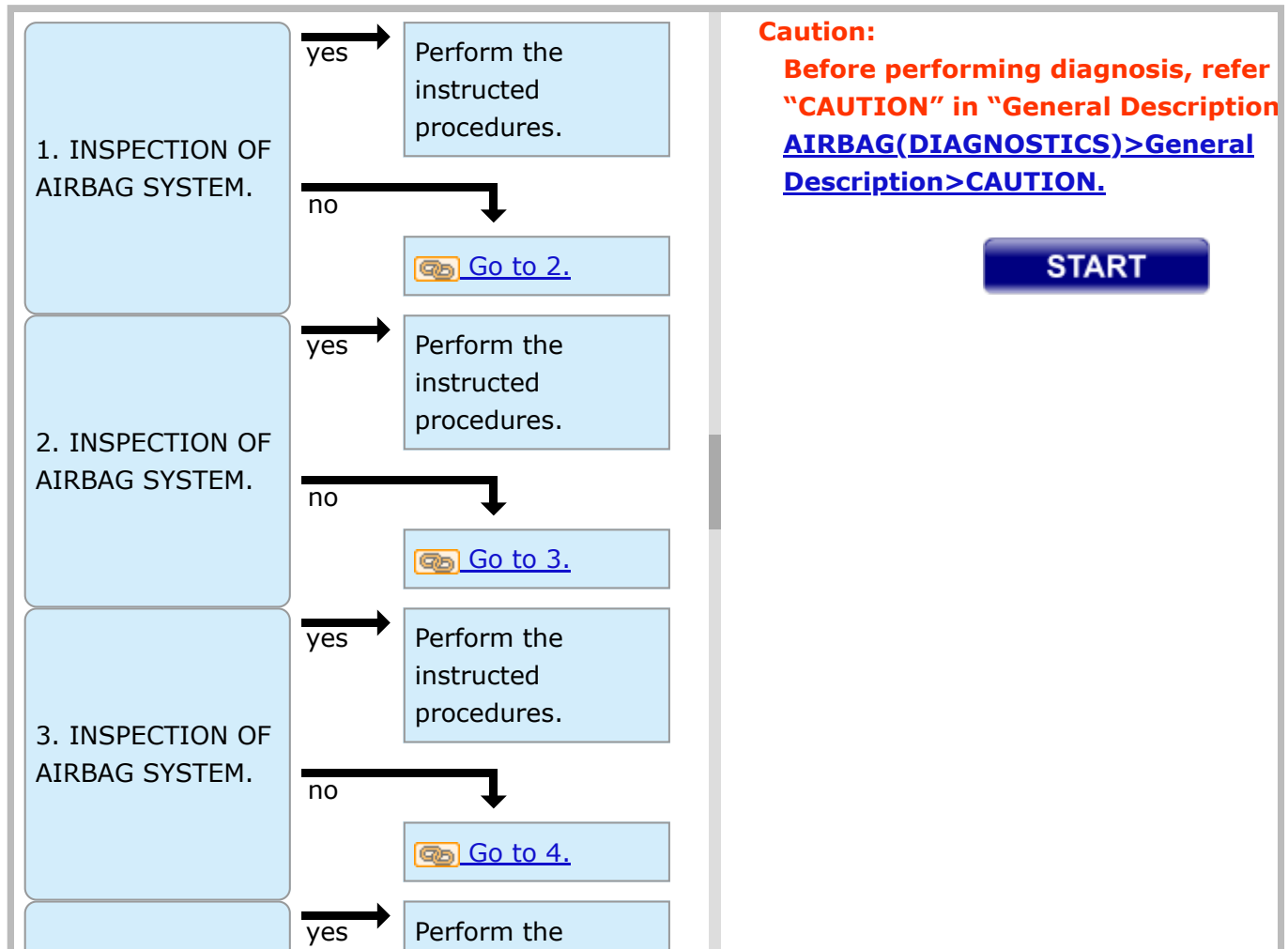
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1642 SIDE SATELLITE SENSOR BUS RH LOST COMMUNICATION

CAUTION/NOTE

INTRO



AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1643 SIDE SATELLITE SENSOR BUS RH INITIALIZATION ERROR

Diagnosis start condition:

When the ignition voltage is 10 V – 16 V

DTC detecting condition:

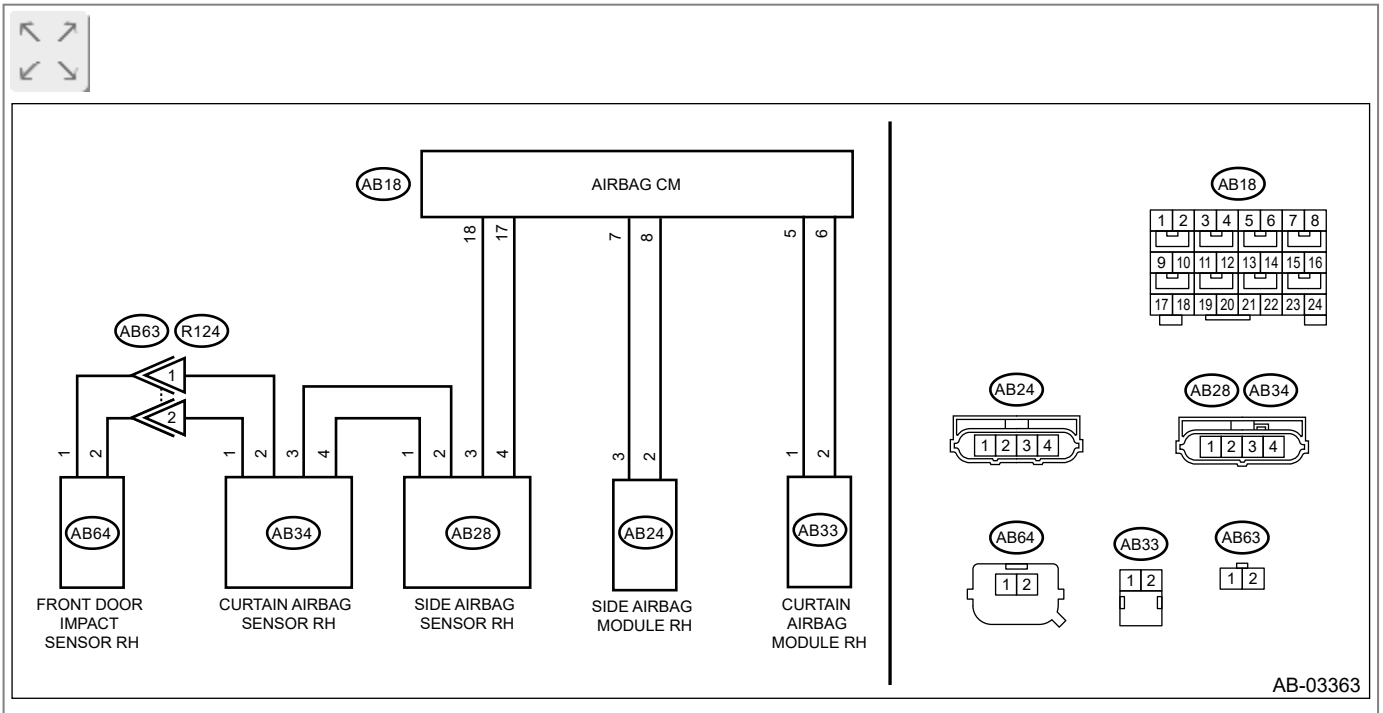
Side satellite sensor bus RH circuit shorted, shorted to ground or shorted to power supply.

Caution:



Before performing diagnosis, refer to "CAUTION" in "General Description".  [Ref. to AIRBAG\(DIAGNOSTICS\)>General Description>CAUTION.](#)

Wiring diagram:

Airbag system  [Ref. to WIRING SYSTEM>Airbag_System>WIRING DIAGRAM.](#)




1. INSPECTION OF AIRBAG SYSTEM.

1. Perform the Inspection Mode.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Inspection Mode.](#)
2. Read the DTC.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is [AIRBAG ECU MALFUNCTION], or DTC B1620, DTC B1630, DTC B1690 a current malfunction?

Yes

Perform the diagnosis for the displayed DTCs.  [Ref. to AIRBAG\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 2.](#)

2. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the front door impact sensor RH.

Is there poor contact?

Yes

Replace the door harness RH, or replace the airbag rear harness along with body harness.

No

 [Go to 3.](#)

3. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND SIDE AIRBAG SENSOR RH).

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Disconnect the connector (AB26) from seat belt pretensioner RH.
3. Disconnect the connector (AB33) from curtain airbag module RH.
4. Disconnect the connector (AB24) of side airbag module RH.
5. Disconnect the connector (AB30) from the lap seat belt pretensioner RH.
6. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
7. Disconnect the connector (AB28) from side airbag sensor RH, and connect the connector (2V) in test harness V to connector (AB28).
8. Measure the resistance between connector (3V) in test harness V and chassis ground, and between connector (3V) terminals in test harness V.

Connector & terminal

(3V) No. 1 — Chassis ground:

(3V) No. 2 — Chassis ground:

(3V) No. 1 — (3V) No. 2:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND SIDE AIRBAG SENSOR RH).

Measure the voltage between connector (3V) in the test harness V and chassis ground.


Connector & terminal

(3V) No. 1 (+) — Chassis ground (-):

(3V) No. 2 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes

 [Go to 5.](#)

No

Replace the airbag rear harness along with body harness.

5. CHECK AIRBAG REAR HARNESS (BETWEEN SIDE AIRBAG SENSOR RH AND CURTAIN AIRBAG SENSOR RH).



1. Disconnect the connector (2V) in the test harness V from the connector (AB28) of side airbag sensor RH.
2. Connect the connector (AB28) of side airbag sensor RH and the connector (1AI) in the test harness AI.
3. Connect the connector (2AI) in the test harness AI and the connector (1V) in the test harness V.
4. Disconnect the connector (AB34) from curtain airbag sensor (RH), and connect the connector (2V) in test harness V to connector (AB34).
5. Measure the resistance between connector (3V) in test harness V and chassis ground, and between connector (3V) terminals in test harness V.

Connector & terminal

(3V) No. 1 — Chassis ground:

(3V) No. 2 — Chassis ground:

(3V) No. 1 — (3V) No. 2:

Is the resistance 1 MΩ or more?

Yes

 [Go to 6.](#)

No

Replace the airbag rear harness along with body harness.

6. CHECK AIRBAG REAR HARNESS (BETWEEN SIDE AIRBAG SENSOR RH AND CURTAIN AIRBAG SENSOR RH).



Measure the voltage between connector (3V) in the test harness V and chassis ground.

Connector & terminal

(3V) No. 1 (+) — Chassis ground (-):

(3V) No. 2 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes

 [Go to 7.](#)

No

Replace the airbag rear harness along with body harness.

7. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS RH (BETWEEN CURTAIN AIRBAG SENSOR RH AND FRONT DOOR IMPACT SENSOR RH).



1. Disconnect the connector (AB64) from front door impact sensor RH.
2. Measure the resistance between connector (3V) in test harness V and chassis ground, and between connector (3V) terminals in test harness V.

Connector & terminal

(3V) No. 4 – Chassis ground:

(3V) No. 5 – Chassis ground:

(3V) No. 4 – (3V) No. 5:

Is the resistance 1 M Ω or more?

Yes

 [Go to 9.](#)

No

 [Go to 8.](#)

8. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS RH (BETWEEN CURTAIN AIRBAG SENSOR RH AND FRONT DOOR IMPACT SENSOR RH).



1. Disconnect the connector (R124) in the airbag rear harness and the connector (AB63) in the door harness RH.
2. Measure the resistance between connector (3V) in test harness V and chassis ground, and between connector (3V) terminals in test harness V.

Connector & terminal

(3V) No. 4 – Chassis ground:

(3V) No. 5 – Chassis ground:

(3V) No. 4 – (3V) No. 5:

Is the resistance 1 M Ω or more?

Yes

Replace the door harness RH.



No

Replace the airbag rear harness along with body harness.

9. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS RH (BETWEEN CURTAIN AIRBAG SENSOR RH AND FRONT DOOR IMPACT SENSOR RH).



Measure the voltage between connector (3V) in the test harness V and chassis ground.


Connector & terminal

(3V) No. 4 (+) – Chassis ground (-):


(3V) No. 5 (+) – Chassis ground (-):

Is the voltage less than 1 V?

Yes

 [Go to 11.](#)

No

 [Go to 10.](#)

10. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS RH (BETWEEN CURTAIN AIRBAG SENSOR RH AND FRONT DOOR IMPACT SENSOR RH).



1. Disconnect the connector (R124) in the airbag rear harness and the connector (AB63) in the door harness RH.
2. Measure the voltage between connector (3V) in the test harness V and chassis ground.

Connector & terminal

(3V) No. 4 (+) – Chassis ground (-):

(3V) No. 5 (+) – Chassis ground (-):

Is the voltage less than 1 V?

Yes


Replace the door harness RH.




No

Replace the airbag rear harness along with body harness.

11. REPLACE FRONT DOOR IMPACT SENSOR RH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.




1. Replace the front door impact sensor RH.  [Ref. to AIRBAG SYSTEM>Front Door Impact Sensor>REMOVAL.](#)
2. Connect all connectors.

3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Clear the memory.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Clear memory.](#)
5. Perform the Inspection Mode.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Inspection Mode.](#)
6. Read the DTC. (Current malfunction)  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1643 a current malfunction?





Yes

 [Go to 12.](#)

No

Finish the diagnosis.

12. REPLACE CURTAIN AIRBAG SENSOR RH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Replace the curtain airbag sensor RH.  [Ref. to AIRBAG SYSTEM>Curtain Airbag Sensor>REMOVAL.](#)
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Clear the memory.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Clear memory.](#)
5. Perform the Inspection Mode.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Inspection Mode.](#)
6. Read the DTC. (Current malfunction)  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1643 a current malfunction?




Yes


 [Go to 13.](#)

No

Finish the diagnosis.


13. REPLACE SIDE AIRBAG SENSOR RH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Replace the side airbag sensor RH.  [Ref. to AIRBAG SYSTEM>Side Airbag Sensor>REMOVAL.](#)
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Clear the memory.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Clear memory.](#)
5. Perform the Inspection Mode.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Inspection Mode.](#)

6. Read the DTC. (Current malfunction)  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1643 a current malfunction?

Yes

Replace the airbag control module.  [Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.](#)

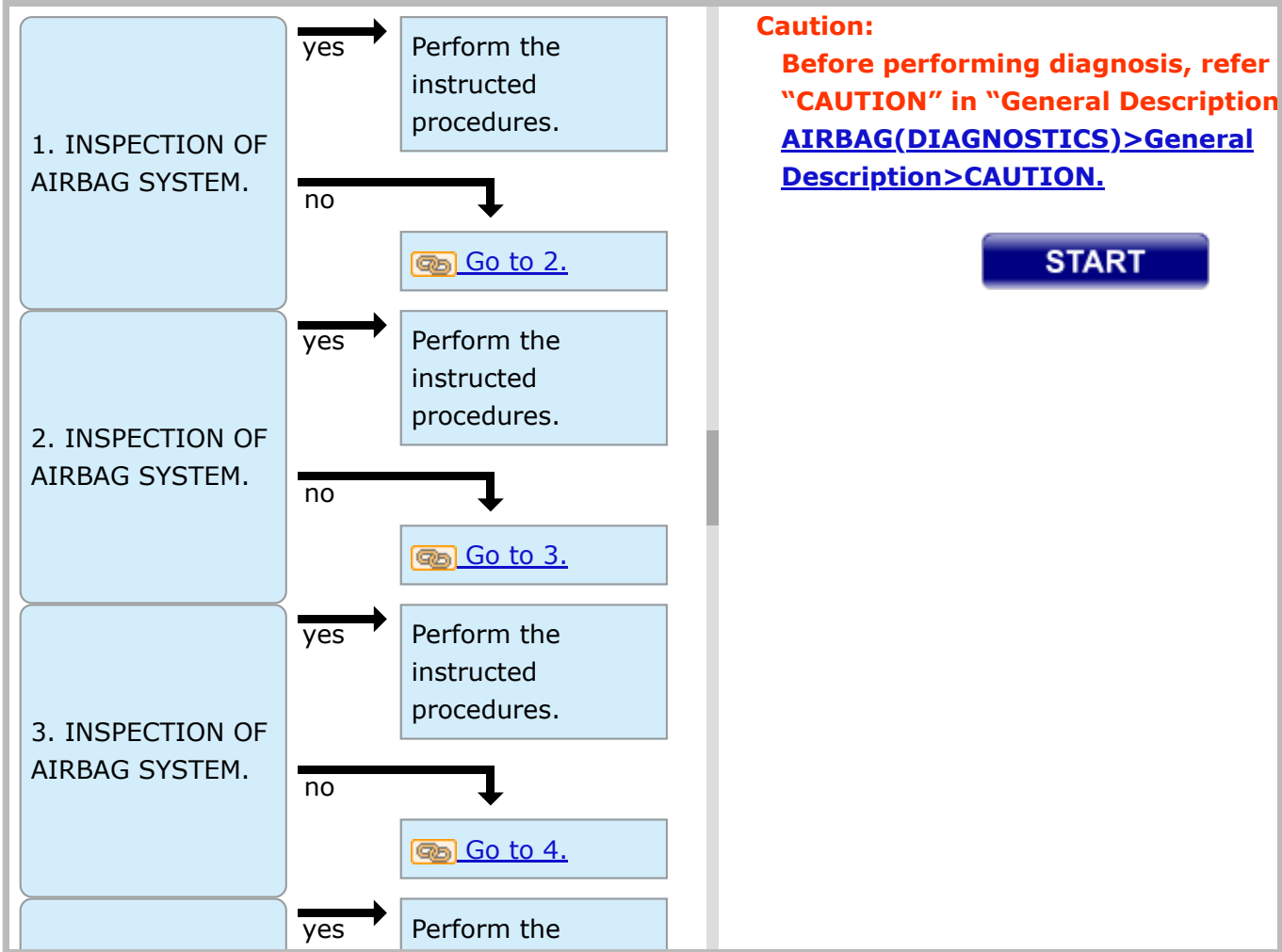
No

Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1647 SIDE SATELLITE SENSOR BUS LH LOST COMMUNICATION

[CAUTION/NOTE](#) [INTRO](#)



AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1648 SIDE SATELLITE SENSOR BUS LH INITIALIZATION ERROR

Diagnosis start condition:

When the ignition voltage is 10 V – 16 V

DTC detecting condition:

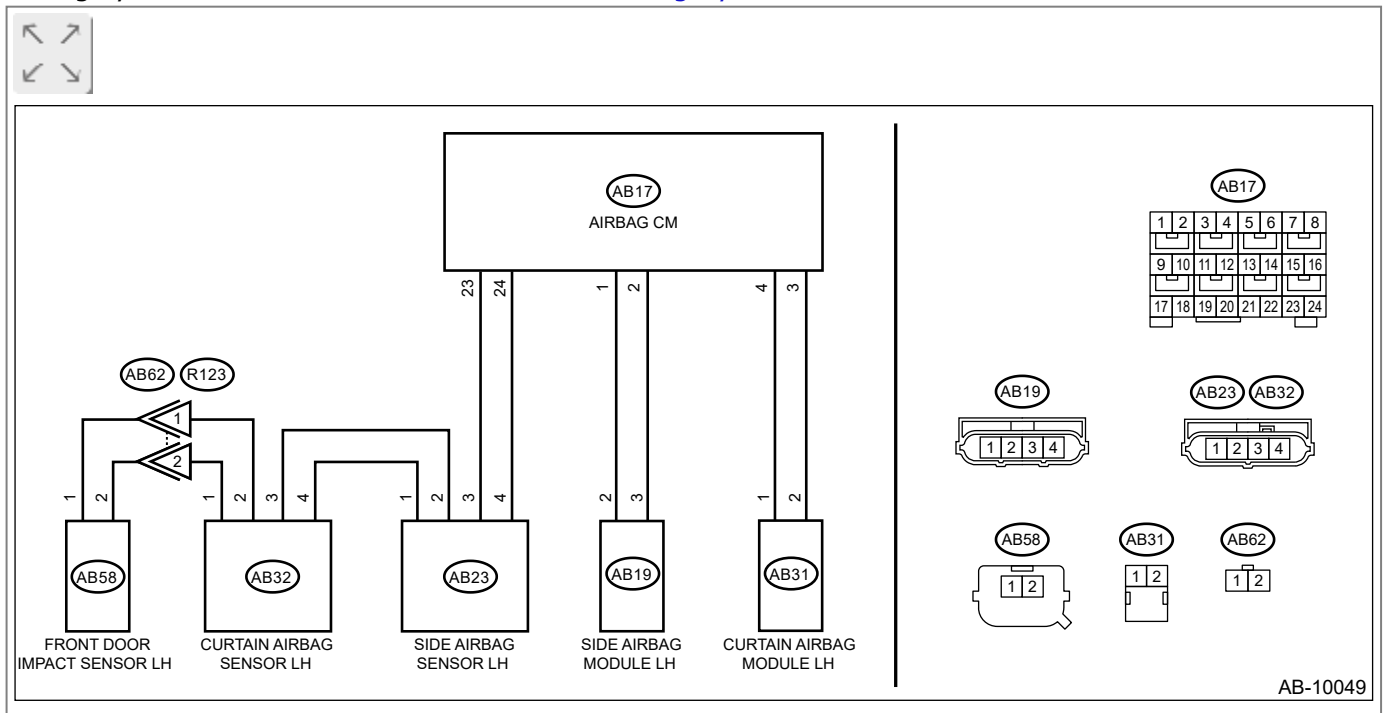
Side satellite sensor bus LH circuit shorted, shorted to ground or shorted to power supply.

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description".  [Ref. to AIRBAG\(DIAGNOSTICS\)>General Description>CAUTION.](#)



Wiring diagram:

Airbag system  [Ref. to WIRING SYSTEM>Airbag_System>WIRING DIAGRAM.](#)




AB-10049

1. INSPECTION OF AIRBAG SYSTEM.

1. Perform the Inspection Mode.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Inspection Mode.](#)
2. Read the DTC.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is [AIRBAG ECU MALFUNCTION], or DTC B1625, DTC B1635, DTC B1695 a current malfunction?

Yes

Perform the diagnosis for the displayed DTCs.  [Ref. to AIRBAG\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 2.](#)

2. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the front door impact sensor LH.

Is there poor contact?

Yes

Replace the door harness LH, or replace the airbag rear harness along with body harness.

No

 [Go to 3.](#)

3. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND SIDE AIRBAG SENSOR LH).

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Disconnect the connector (AB21) from seat belt pretensioner LH.
3. Disconnect the connector (AB31) from curtain airbag module LH.
4. Disconnect the connector (AB19) of the side airbag module LH.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Disconnect the connector (AB23) from side airbag sensor LH, and connect the connector (2V) in test harness V to connector (AB23).
7. Measure the resistance between connector (3V) in test harness V and chassis ground, and between connector (3V) terminals in test harness V.

Connector & terminal

(3V) No. 1 — Chassis ground:

(3V) No. 2 — Chassis ground:

(3V) No. 1 — (3V) No. 2:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND SIDE AIRBAG SENSOR LH).

Measure the voltage between connector (3V) in the test harness V and chassis ground.


Connector & terminal

(3V) No. 1 (+) — Chassis ground (—):

(3V) No. 2 (+) — Chassis ground (—):

Is the voltage less than 1 V?

Yes

 [Go to 5.](#)

No

Replace the airbag rear harness along with body harness.

5. CHECK AIRBAG REAR HARNESS (BETWEEN SIDE AIRBAG SENSOR LH AND CURTAIN AIRBAG SENSOR LH).



1. Disconnect the connector (2V) in the test harness V from the connector (AB23) of side airbag sensor LH.
2. Connect the connector (AB23) of side airbag sensor LH and the connector (1AI) in the test harness AI.
3. Connect the connector (2AI) in the test harness AI and the connector (1V) in the test harness V.
4. Disconnect the connector (AB32) from curtain airbag sensor LH, and connect the connector (2V) in test harness V to connector (AB32).
5. Measure the resistance between connector (3V) in test harness V and chassis ground, and between connector (3V) terminals in test harness V.

Connector & terminal

(3V) No. 1 — Chassis ground:

(3V) No. 2 — Chassis ground:

(3V) No. 1 — (3V) No. 2:

Is the resistance 1 MΩ or more?

Yes

 [Go to 6.](#)

No

Replace the airbag rear harness along with body harness.

6. CHECK AIRBAG REAR HARNESS (BETWEEN SIDE AIRBAG SENSOR LH AND CURTAIN AIRBAG SENSOR LH).



Measure the voltage between connector (3V) in the test harness V and chassis ground.


Connector & terminal

(3V) No. 1 (+) — Chassis ground (—):

(3V) No. 2 (+) — Chassis ground (—):

Is the voltage less than 1 V?

Yes

 [Go to 7.](#)

No

Replace the airbag rear harness along with body harness.

7. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS LH (BETWEEN CURTAIN AIRBAG SENSOR LH AND FRONT DOOR IMPACT SENSOR LH).



1. Disconnect the connector (AB58) from front door impact sensor LH.
2. Measure the resistance between connector (3V) in test harness V and chassis ground, and between connector (3V) terminals in test harness V.

Connector & terminal


(3V) No. 4 — Chassis ground:

(3V) No. 5 — Chassis ground:


(3V) No. 4 — (3V) No. 5:

Is the resistance 1 M Ω or more?

Yes

 [Go to 9.](#)

No

 [Go to 8.](#)

8. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS LH (BETWEEN CURTAIN AIRBAG SENSOR LH AND FRONT DOOR IMPACT SENSOR LH).



1. Disconnect the connector (R123) in the airbag rear harness and the connector (AB62) in the door harness RH.
2. Measure the resistance between connector (3V) in test harness V and chassis ground, and between connector (3V) terminals in test harness V.

Connector & terminal

(3V) No. 4 — Chassis ground:

(3V) No. 5 — Chassis ground:

(3V) No. 4 — (3V) No. 5:

Is the resistance 1 M Ω or more?

Yes

Replace the door harness LH.

No

Replace the airbag rear harness along with body harness.

9. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS LH (BETWEEN CURTAIN AIRBAG SENSOR LH AND FRONT DOOR IMPACT SENSOR LH).



Measure the voltage between connector (3V) in the test harness V and chassis ground.


Connector & terminal

(3V) No. 4 (+) – Chassis ground (-):


(3V) No. 5 (+) – Chassis ground (-):

Is the voltage less than 1 V?

Yes

 [Go to 11.](#)

No

 [Go to 10.](#)

10. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS RH (BETWEEN CURTAIN AIRBAG SENSOR RH AND FRONT DOOR IMPACT SENSOR RH).



1. Disconnect the connector (R123) in the airbag rear harness and the connector (AB62) in the door harness RH.
2. Measure the voltage between connector (3V) in the test harness V and chassis ground.

Connector & terminal

(3V) No. 4 (+) – Chassis ground (-):

(3V) No. 5 (+) – Chassis ground (-):

Is the voltage less than 1 V?

Yes



Replace the door harness LH.



No

Replace the airbag rear harness along with body harness.

11. REPLACE FRONT DOOR IMPACT SENSOR LH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.




1. Replace the front door impact sensor LH.  [Ref. to AIRBAG SYSTEM>Front Door Impact Sensor>REMOVAL.](#)
2. Connect all connectors.
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Clear the memory.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Clear memory.](#)

5. Perform the Inspection Mode.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Inspection Mode.](#)
6. Read the DTC. (Current malfunction)  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1648 a current malfunction?





Yes

 [Go to 12.](#)

No


Finish the diagnosis.

12. REPLACE CURTAIN AIRBAG SENSOR LH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Replace the curtain airbag sensor LH.  [Ref. to AIRBAG SYSTEM>Curtain Airbag Sensor>REMOVAL.](#)
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Clear the memory.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Clear memory.](#)
5. Perform the Inspection Mode.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Inspection Mode.](#)
6. Read the DTC. (Current malfunction)  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1648 a current malfunction?





Yes

 [Go to 13.](#)

No


Finish the diagnosis.

13. REPLACE SIDE AIRBAG SENSOR LH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Replace the side airbag sensor LH.  [Ref. to AIRBAG SYSTEM>Side Airbag Sensor>REMOVAL.](#)
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Clear the memory.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Clear memory.](#)
5. Perform the Inspection Mode.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Inspection Mode.](#)
6. Read the DTC. (Current malfunction)  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1648 a current malfunction?

Yes

Replace the airbag control module.  [Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.](#)

No

Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1650 OCCUPANT DETECTION SYSTEM MALFUNCTION


Note:

Refer to "Occupant Detection System" for details on DTC B1650.  [Ref. to OCCUPANT DETECTION\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1650 OCCUPANT DETECTION SYSTEM MALFUNCTION.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1655 FRONT BUCKLE SWITCH RH FAILURE

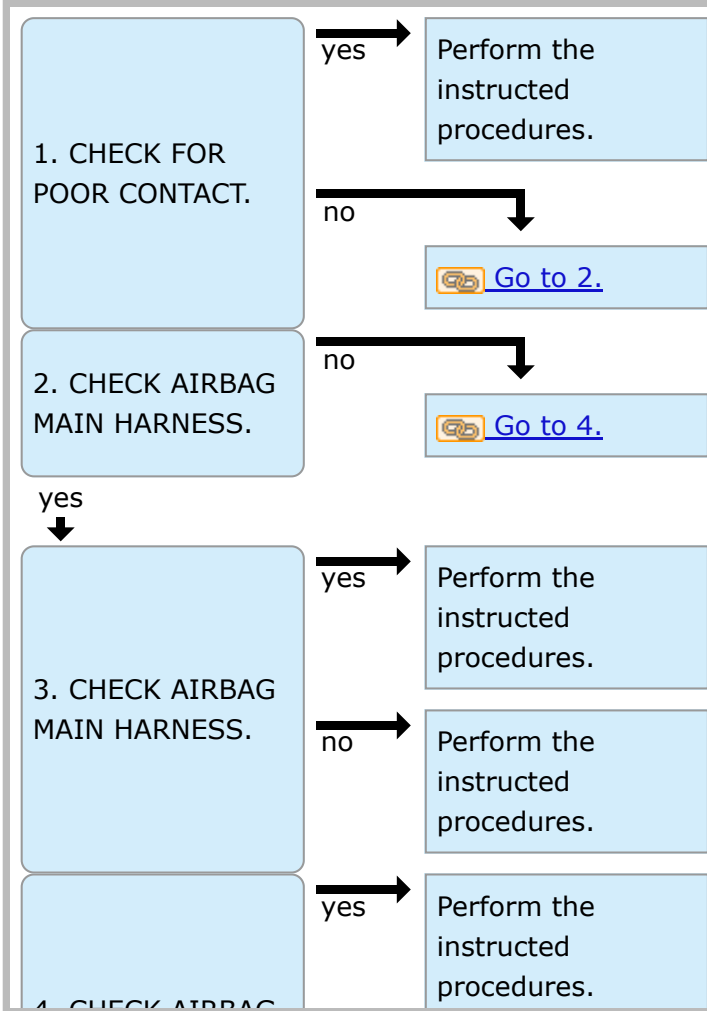
Note:

Refer to "Occupant Detection System" for details on DTC B1655.  [Ref. to OCCUPANT DETECTION\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1655 FRONT BUCKLE SWITCH RH FAILURE.](#)

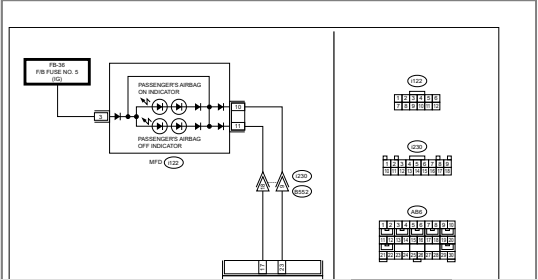
AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1660 PASSENGER'S AIRBAG ON INDICATOR FAILURE

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

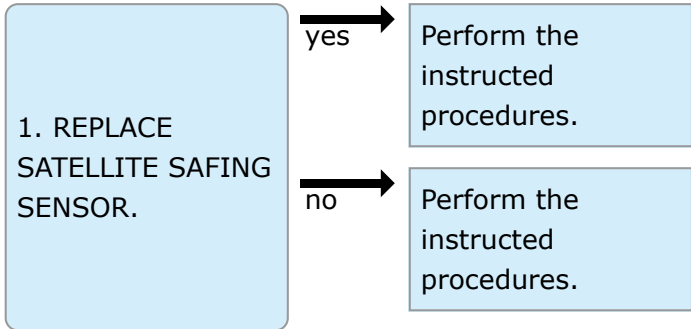
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1675 SATELLITE SAFING SENSOR FAILURE

CAUTION/NOTE

INTRO



Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION."

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1676 LOST COMMUNICATION WITH SATELLITE SAFING SENSOR

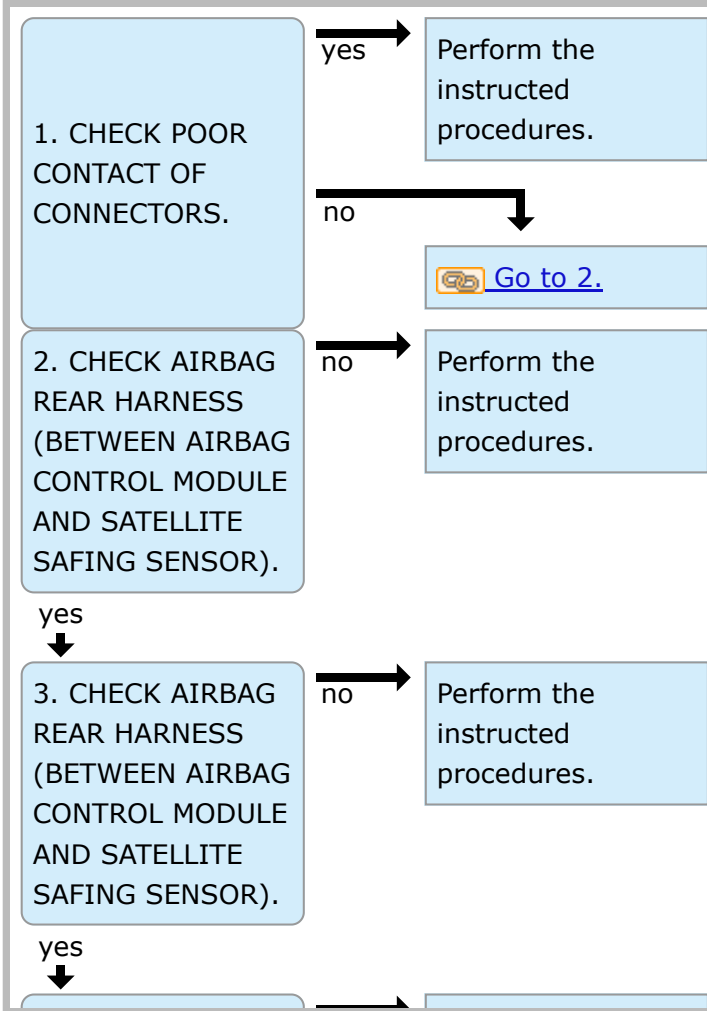
Note:

For details on DTC B1676, refer to DTC B1677.  Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1677 SATELLITE SAFING SENSOR INITIALIZATION INCOMPLETE.

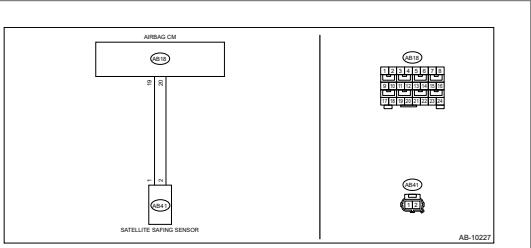
AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1677 SATELLITE SAFING SENSOR INITIALIZATION INCOMPLETE

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer **"CAUTION"** in **"General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.**

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1690 DOOR SENSOR RH FAILURE

Diagnosis start condition:

When the ignition voltage is 10 V — 16 V

DTC detecting condition:

Front door impact sensor RH is faulty.

Airbag control module is faulty.

If DTC B1690 is displayed, the circuit within the front door impact sensor RH is faulty.

Replace the front door impact sensor RH.  [Ref. to AIRBAG SYSTEM>Front Door Impact Sensor>REMOVAL.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1692 LOST COMMUNICATION WITH DOOR SENSOR RH

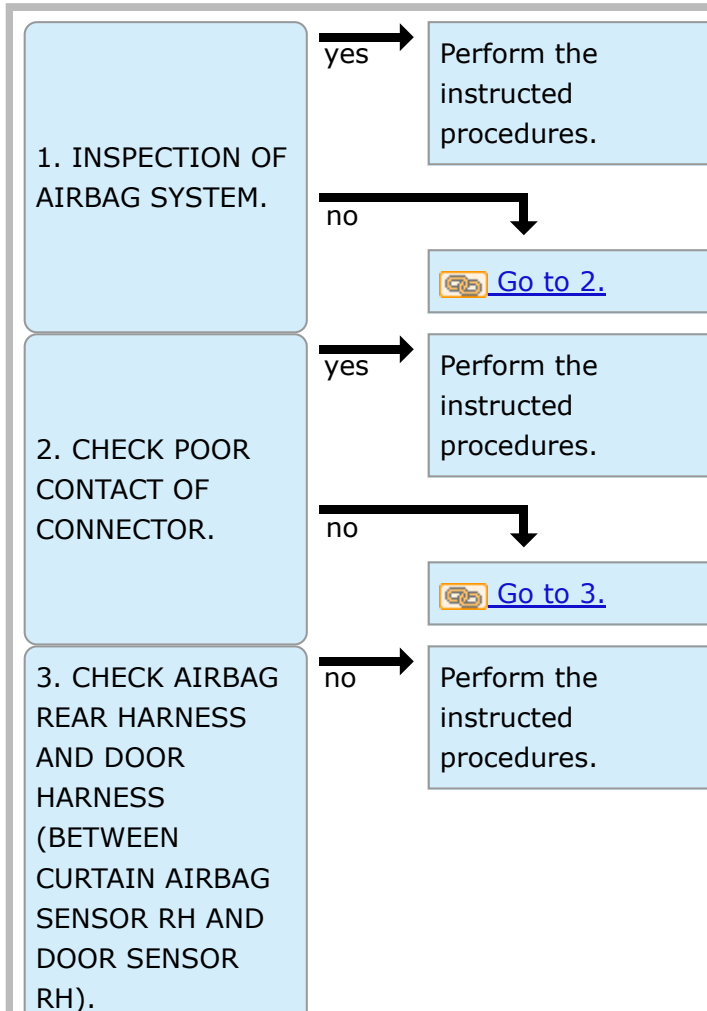
Note:

For details on DTC B1692, refer to DTC B1693.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1693 DOOR SENSOR RH INITIALIZATION INCOMPLETE.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

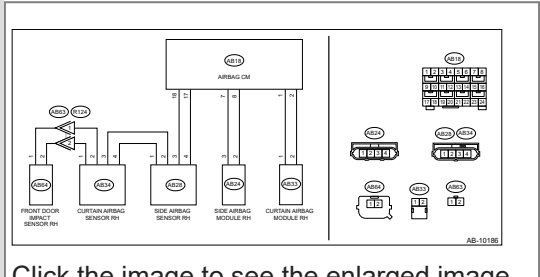
DTC B1693 DOOR SENSOR RH INITIALIZATION INCOMPLETE

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:

Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1695 DOOR SENSOR LH FAILURE


DIAGNOSIS START CONDITION:

When the ignition voltage is 10 V — 16 V

DTC DETECTING CONDITION:

Front door impact sensor LH is faulty.

If DTC AB is displayed, the circuit within the front door impact sensor LH is faulty.

Replace the front door impact sensor LH.  [Ref. to AIRBAG SYSTEM>Front Door Impact Sensor>REMOVAL.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1697 LOST COMMUNICATION WITH DOOR SENSOR LH

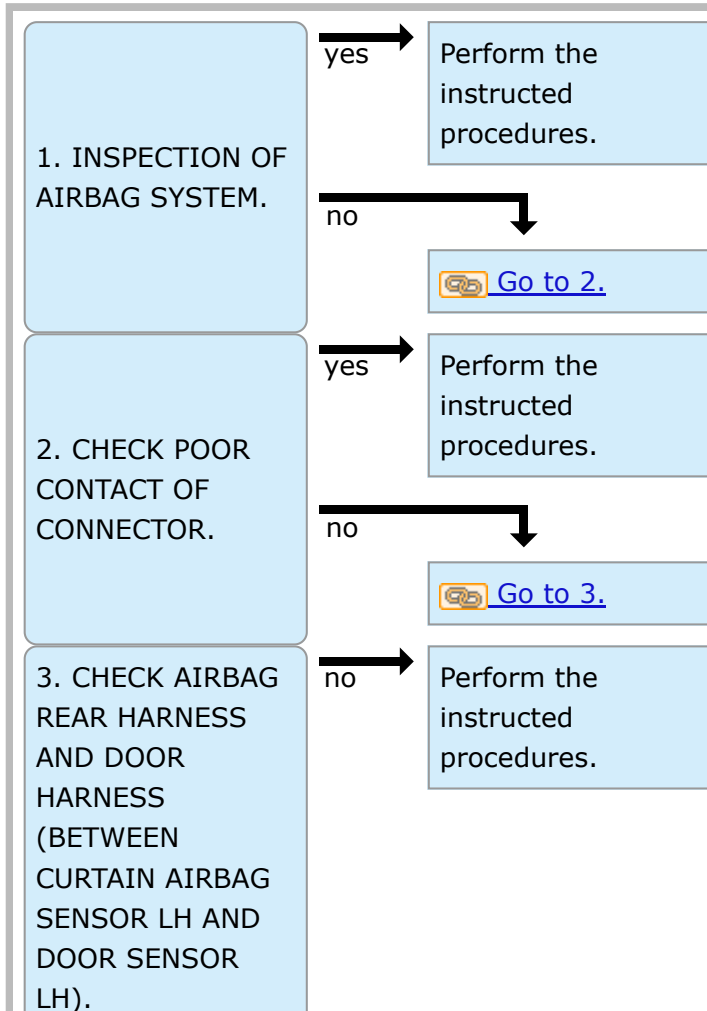
Note:

For details on DTC B1697, refer to DTC B1698.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1698 DOOR SENSOR LH INITIALIZATION INCOMPLETE.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

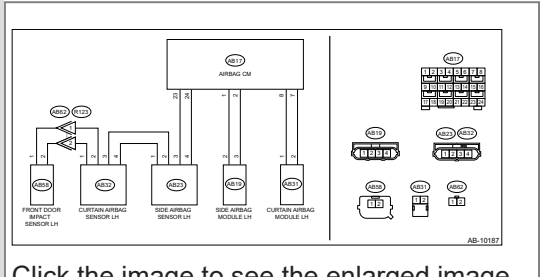
DTC B1698 DOOR SENSOR LH INITIALIZATION INCOMPLETE

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:

Before performing diagnosis, refer "CAUTION" in "General Description"

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B16F0 PASSENGER'S AIRBAG OFF INDICATOR FAILURE

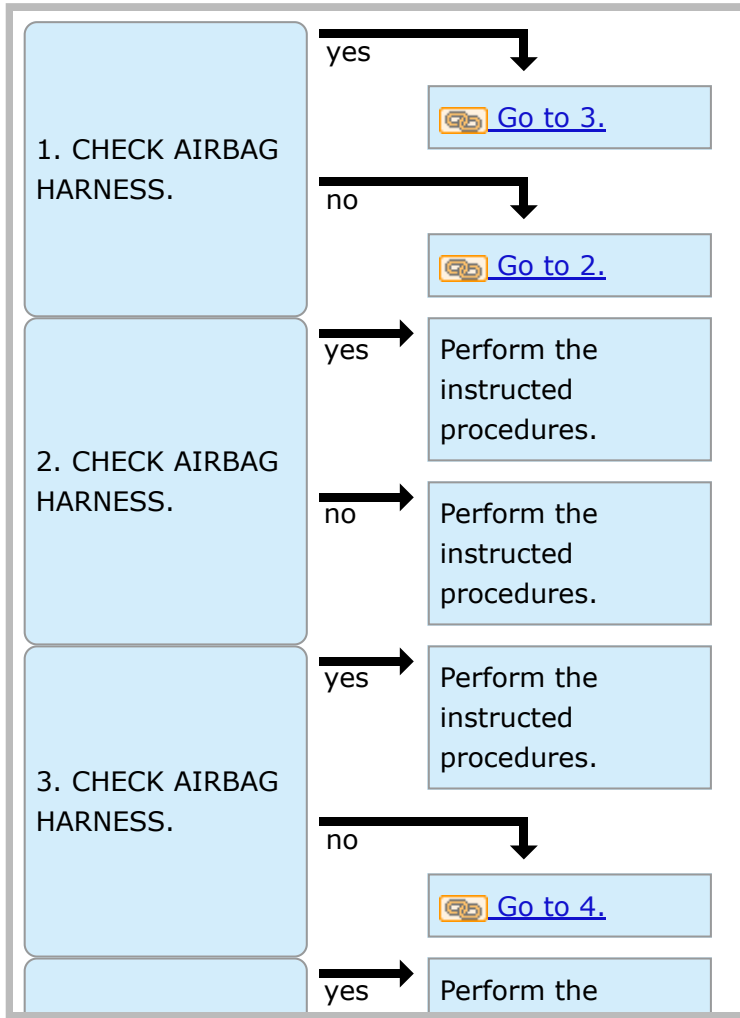
Note:

For details on DTC B16F0, refer to DTC B1660.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1660 PASSENGER'S AIRBAG ON INDICATOR FAILURE.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

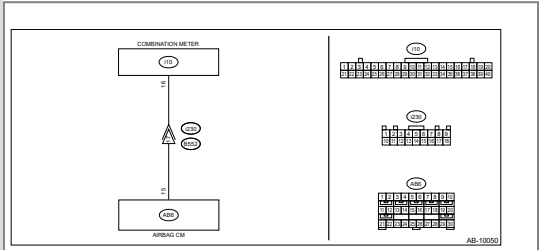
DTC B16F1 PASSENGER'S SEAT BELT WARNING FAILURE

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

Seat belt warning system [Ref. to WIRING SYSTEM>Seat Belt Warning System.](#)



Click the image to see the enlarged image

Caution:

Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B16F2 FRONT SUB SENSOR RH RECOGNITION ERROR

CAUTION/NOTE

INTRO

1. REPLACE FRONT SUB SENSOR.

yes →

Perform the instructed procedures.

no →

Perform the instructed procedures.

Caution:

Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B16F3 FRONT SUB SENSOR LH RECOGNITION ERROR

CAUTION/NOTE

INTRO

1. REPLACE FRONT
SUB SENSOR.

yes →

Perform the
instructed
procedures.

no →

Perform the
instructed
procedures.

Caution:

**Before performing diagnosis, refer
"CAUTION" in "General Description
[AIRBAG\(DIAGNOSTICS\)>General
Description>CAUTION.](#)**

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B16F4 SIDE AIRBAG SENSOR RH RECOGNITION ERROR

CAUTION/NOTE

INTRO

1. REPLACE SIDE AIRBAG SENSOR RH.

yes →

Perform the instructed procedures.

no →

Perform the instructed procedures.

Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION."

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B16F5 SIDE AIRBAG SENSOR LH RECOGNITION ERROR

CAUTION/NOTE

INTRO

1. REPLACE SIDE AIRBAG SENSOR LH.

yes →

Perform the instructed procedures.

no →

Perform the instructed procedures.

Caution:

Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

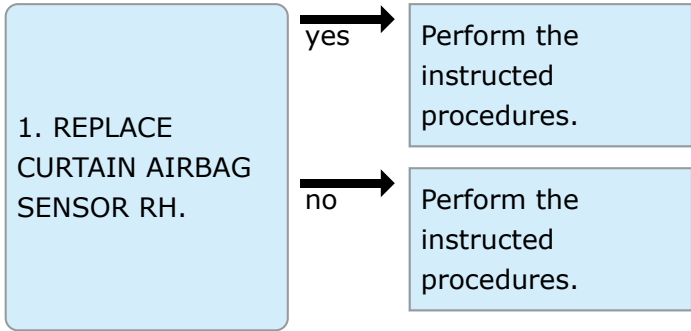
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B16F6 CURTAIN AIRBAG SENSOR RH RECOGNITION ERROR

CAUTION/NOTE

INTRO



Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION."

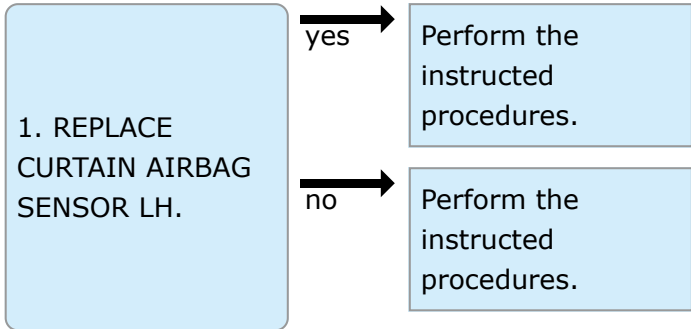
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B16F7 CURTAIN AIRBAG SENSOR LH RECOGNITION ERROR

CAUTION/NOTE

INTRO



Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION."

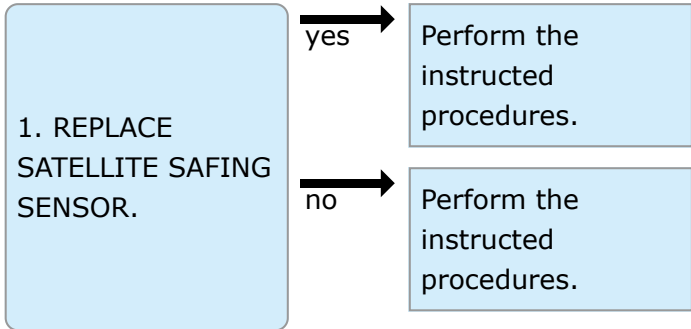
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B16F8 SATELLITE SAFING SENSOR RECOGNITION ERROR

CAUTION/NOTE

INTRO



Caution:

- **Before performing diagnosis, refer to "CAUTION" in "General Description to AIRBAG(DIAGNOSTICS)>General Description">CAUTION.**

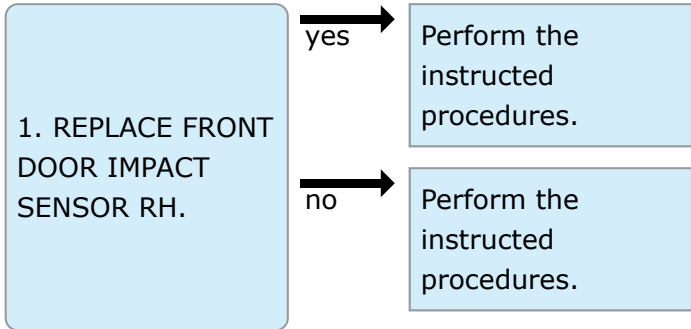
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B16F9 DOOR SENSOR RH RECOGNITION ERROR

CAUTION/NOTE

INTRO



Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION."

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B16FA DOOR SENSOR LH RECOGNITION ERROR

CAUTION/NOTE

INTRO

1. REPLACE FRONT DOOR IMPACT SENSOR LH.

yes →

Perform the instructed procedures.

no →

Perform the instructed procedures.


Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION."

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1760 OCCUPANT DETECTION SENSOR MAT


Note:

Refer to "Occupant Detection System" for details on DTC B1760.  [Ref. to OCCUPANT DETECTION\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1760 OCCUPANT DETECTION SENSOR MAT.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1771 BUCKLE SWITCH

Note:

Refer to "Occupant Detection System" for details on DTC B1771.  [Ref. to OCCUPANT DETECTION\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1771 BUCKLE SWITCH.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1795 OCCUPANT DETECTION MODULE INTERNAL CIRCUIT

Note:

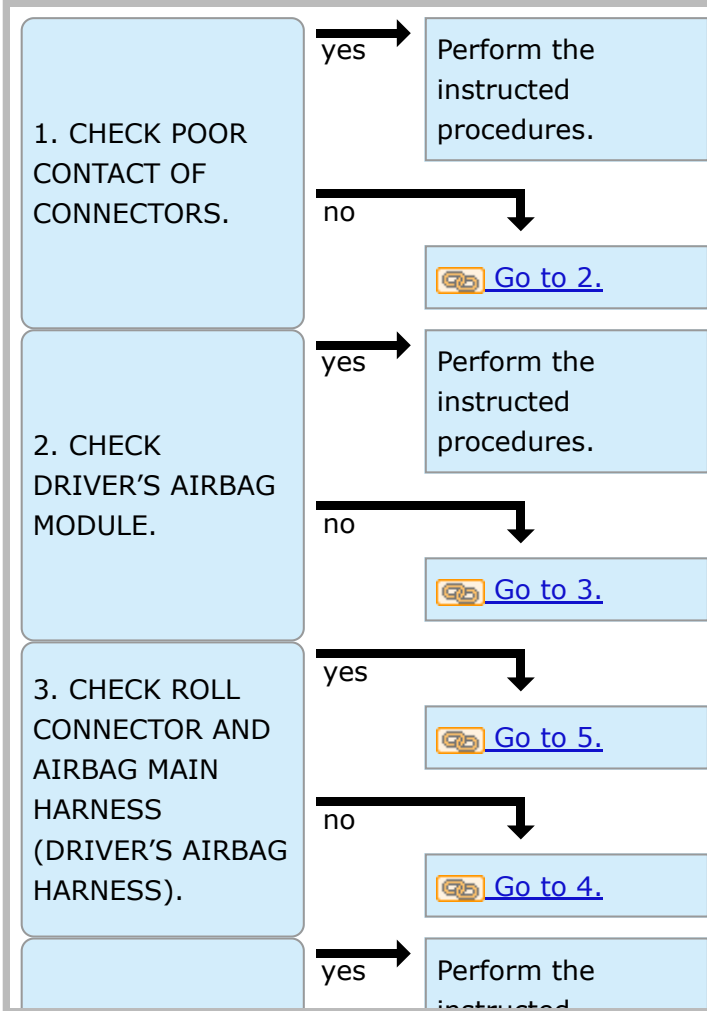
Refer to "Occupant Detection System" for details on DTC B1795.  [Ref. to OCCUPANT DETECTION\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1795 OCCUPANT DETECTION MODULE INTERNAL CIRCUIT.](#)

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1800 SHORT IN DRIVER'S AIRBAG

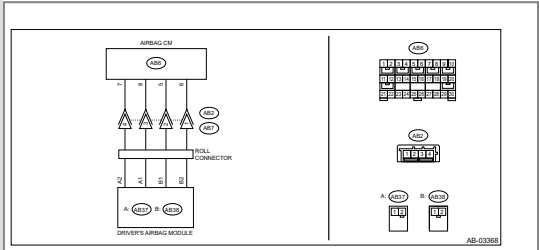
CAUTION/NOTE

INTRO



Wiring diagram:

Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:

Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

Note:

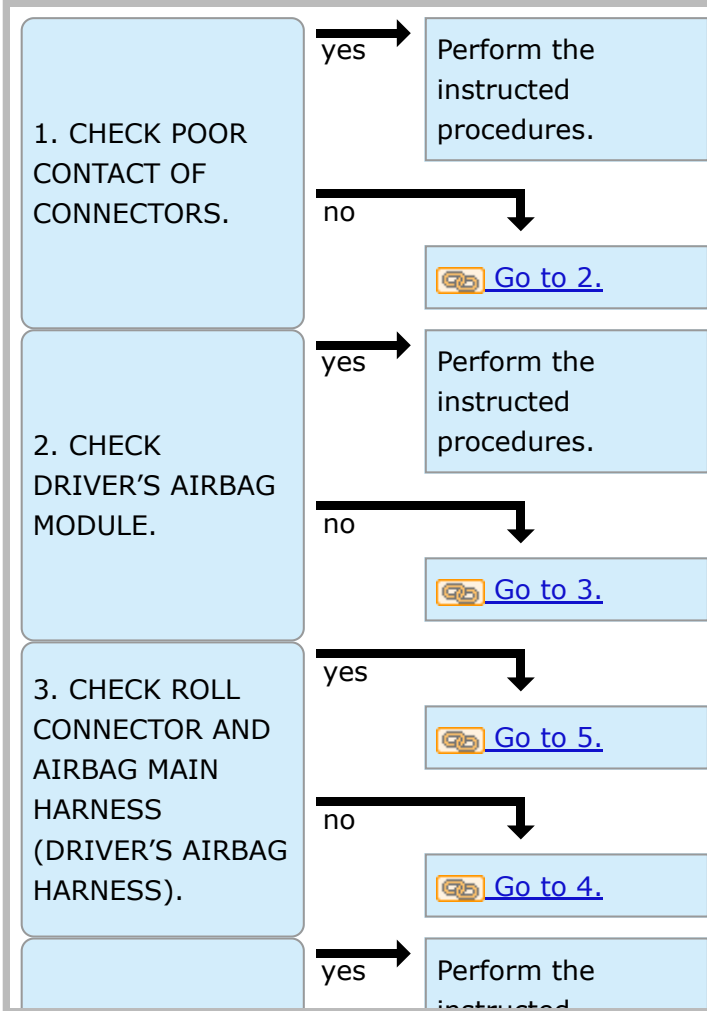
Prior to starting work, prepare two RESISTORS (98299PA040).

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

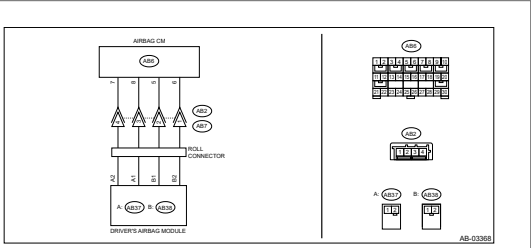
DTC B1801 OPEN IN DRIVER'S AIRBAG

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

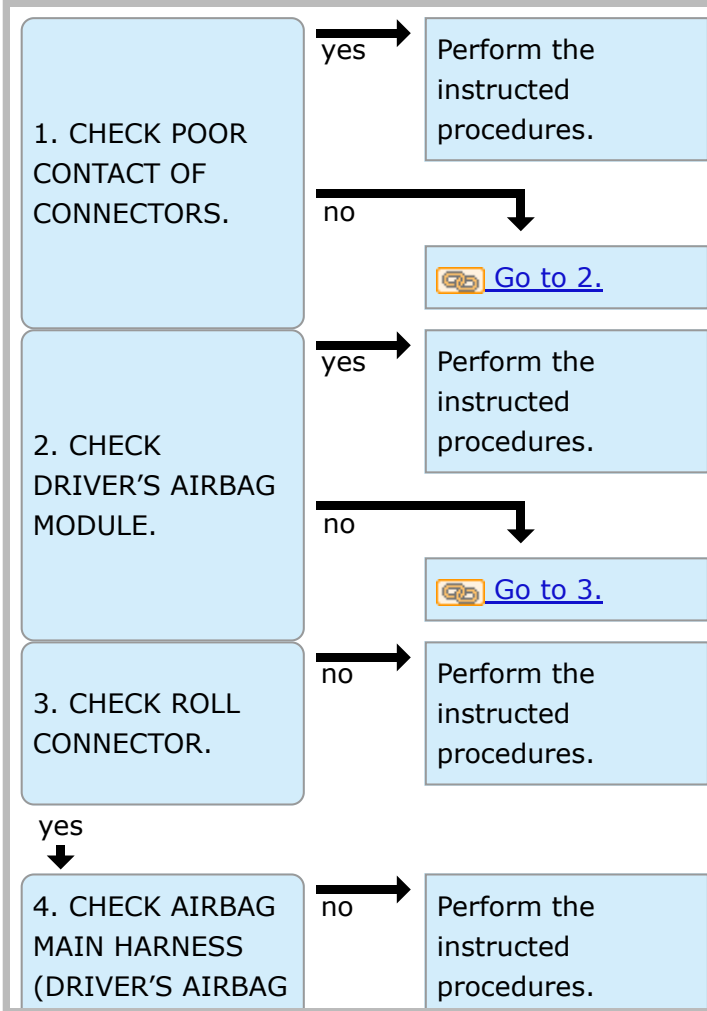
Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION."

Note:
Prior to starting work, prepare two RESISTORS (98299PA040).

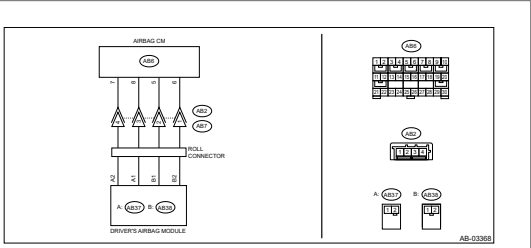
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC B1802 SHORT IN DRIVER'S AIRBAG (TO GROUND)

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

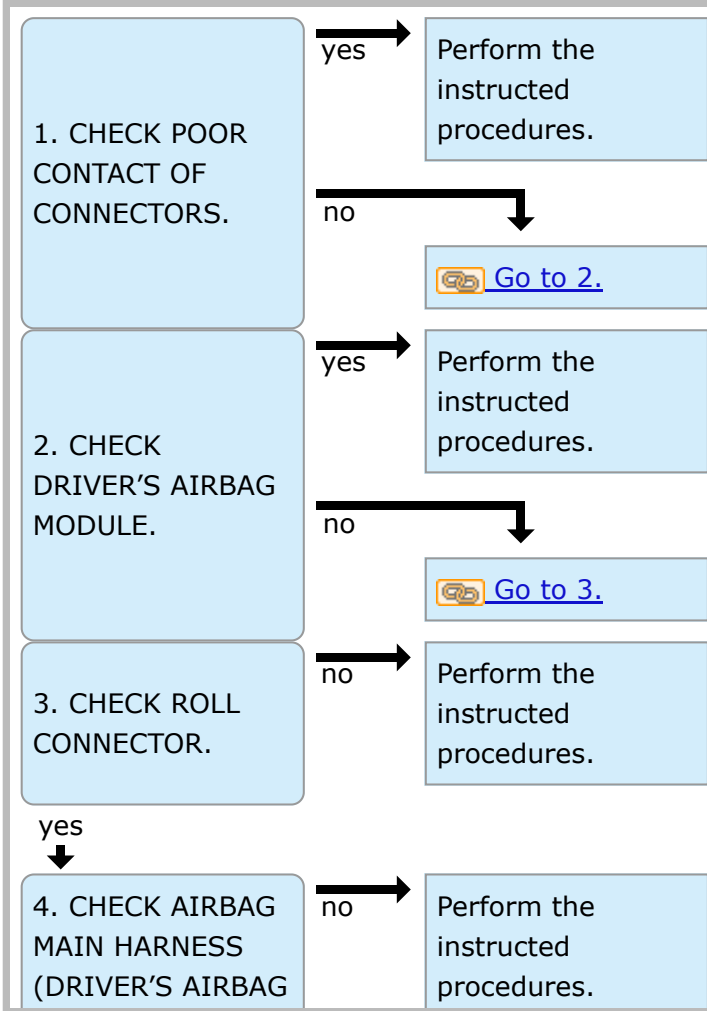
Caution:
 Before performing diagnosis, refer **"CAUTION"** in **"General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.**

Note:
 Prior to starting work, prepare two **RESISTORS (98299PA040).**

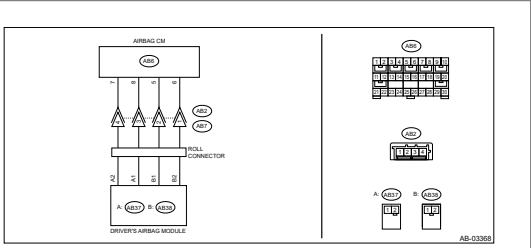
START

**AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
 DTC B1803 SHORT IN DRIVER'S AIRBAG (TO +B)**

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:
 Before performing diagnosis, refer **"CAUTION"** in **"General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.**

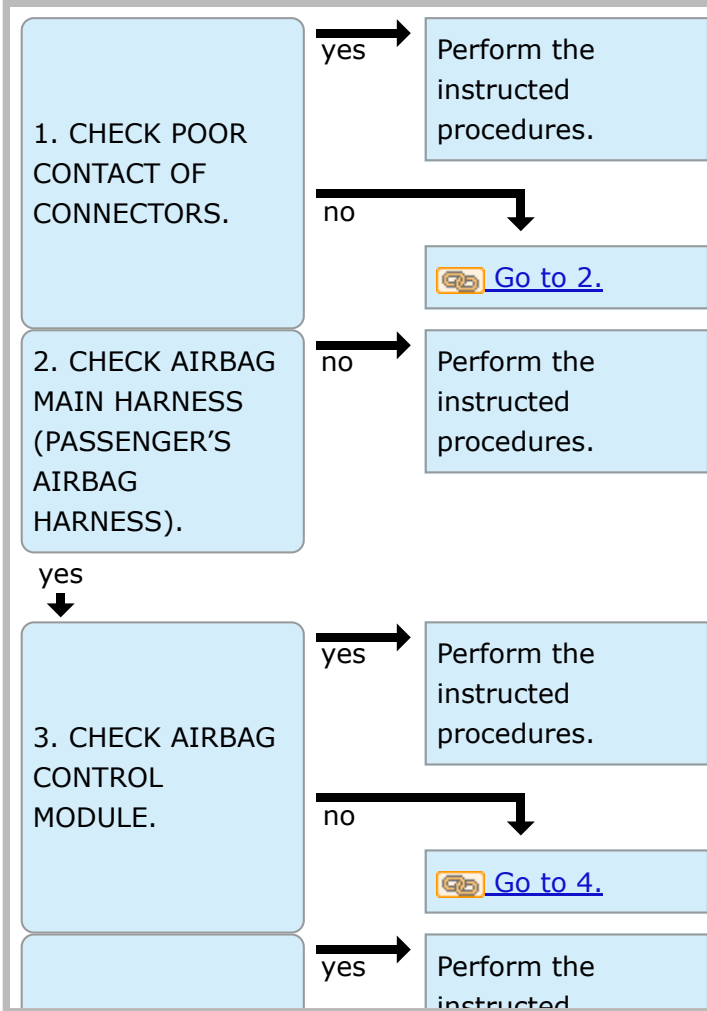
Note:
 Prior to starting work, prepare two **RESISTORS (98299PA040).**

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

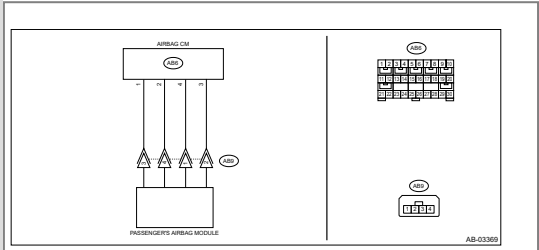
DTC B1805 SHORT IN PASSENGER'S AIRBAG

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:

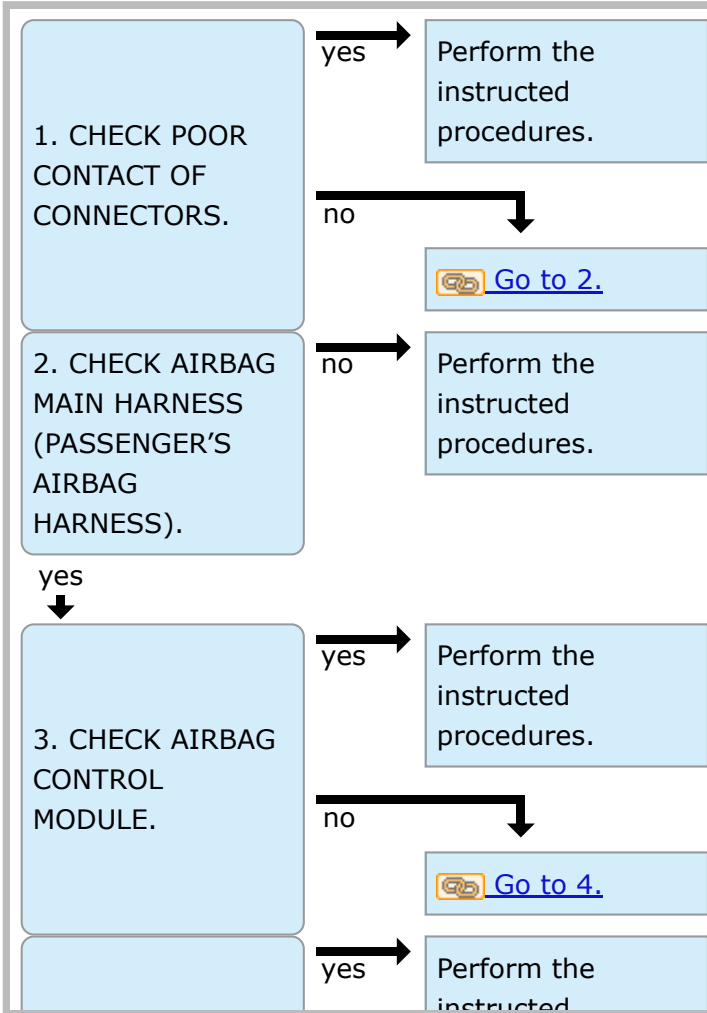
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

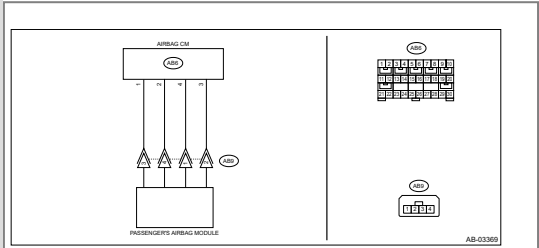
DTC B1806 OPEN IN PASSENGER'S AIRBAG

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

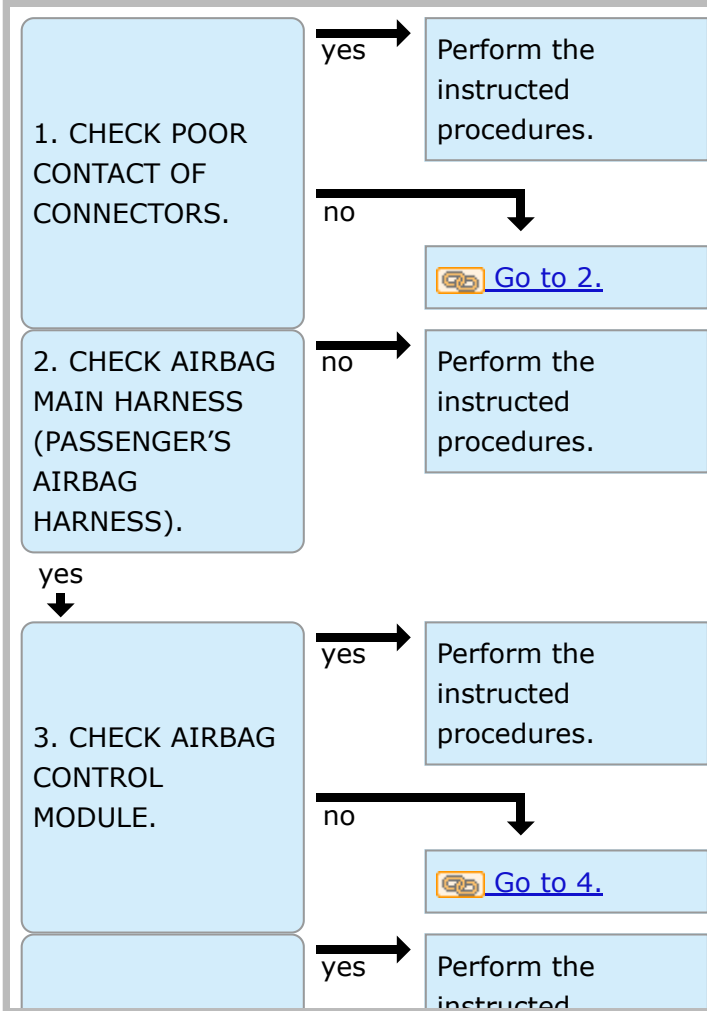
Caution:

Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

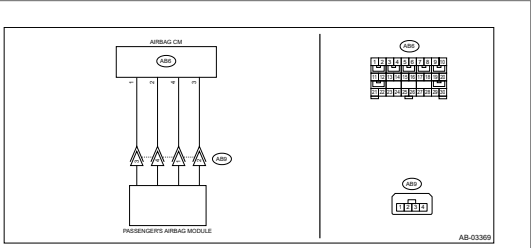
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC B1807 SHORT IN PASSENGER'S AIRBAG (TO GROUND)

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



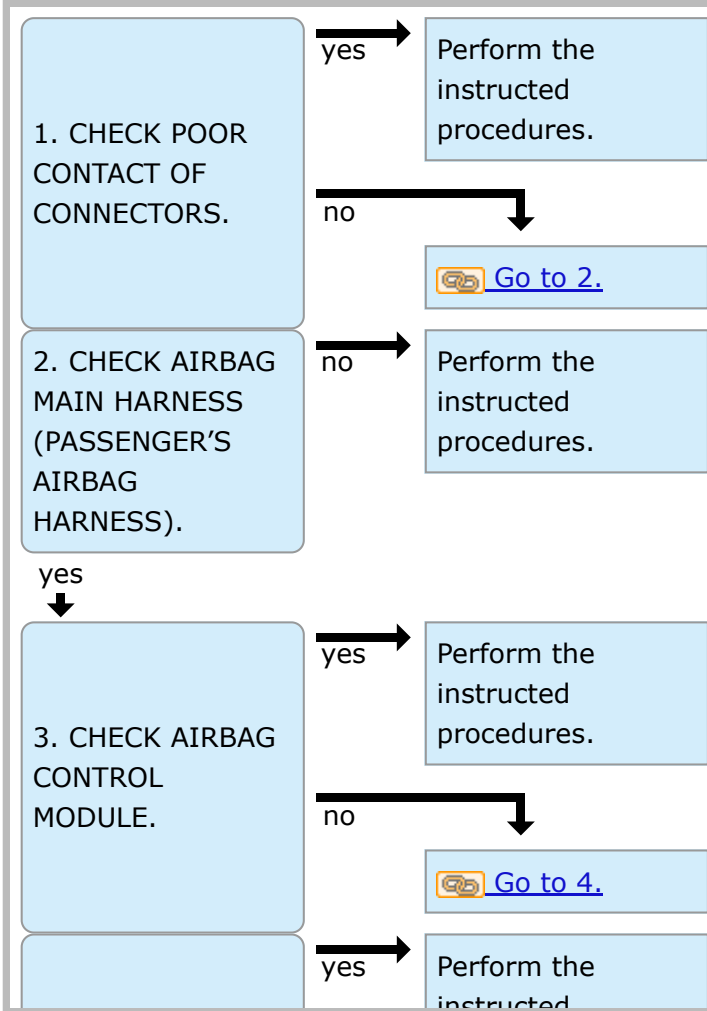
Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

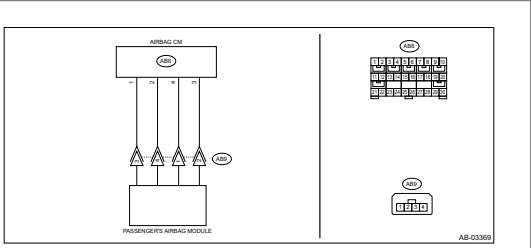
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC B1808 SHORT IN PASSENGER'S AIRBAG (TO +B)

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

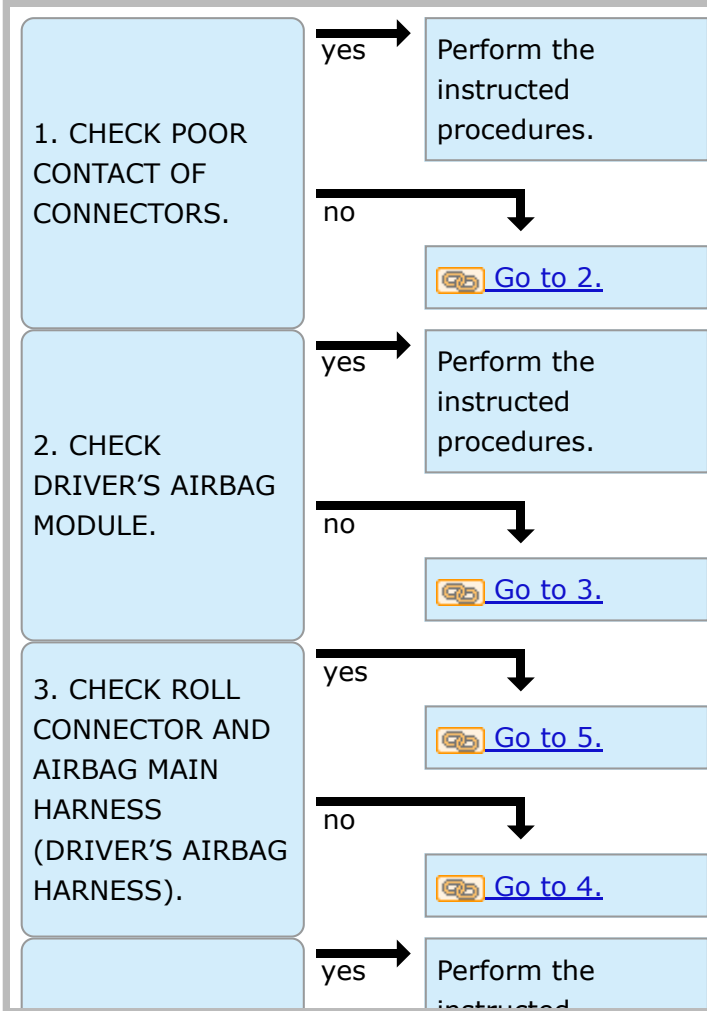
Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

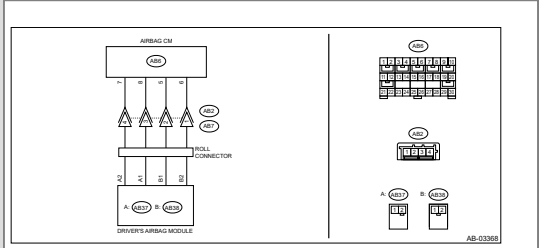
DTC B1810 SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:

Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

Note:

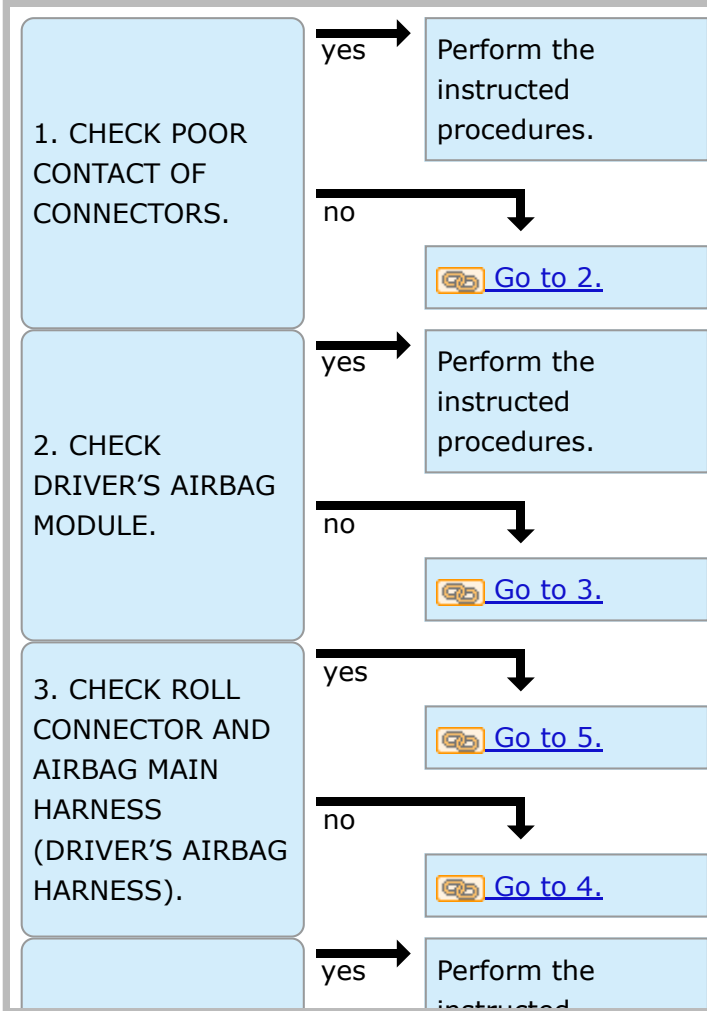
Prior to starting work, prepare two RESISTORS (98299PA040).

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

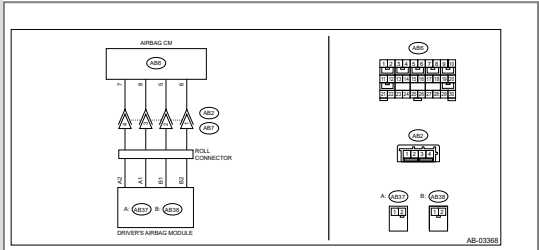
DTC B1811 OPEN IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:

Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

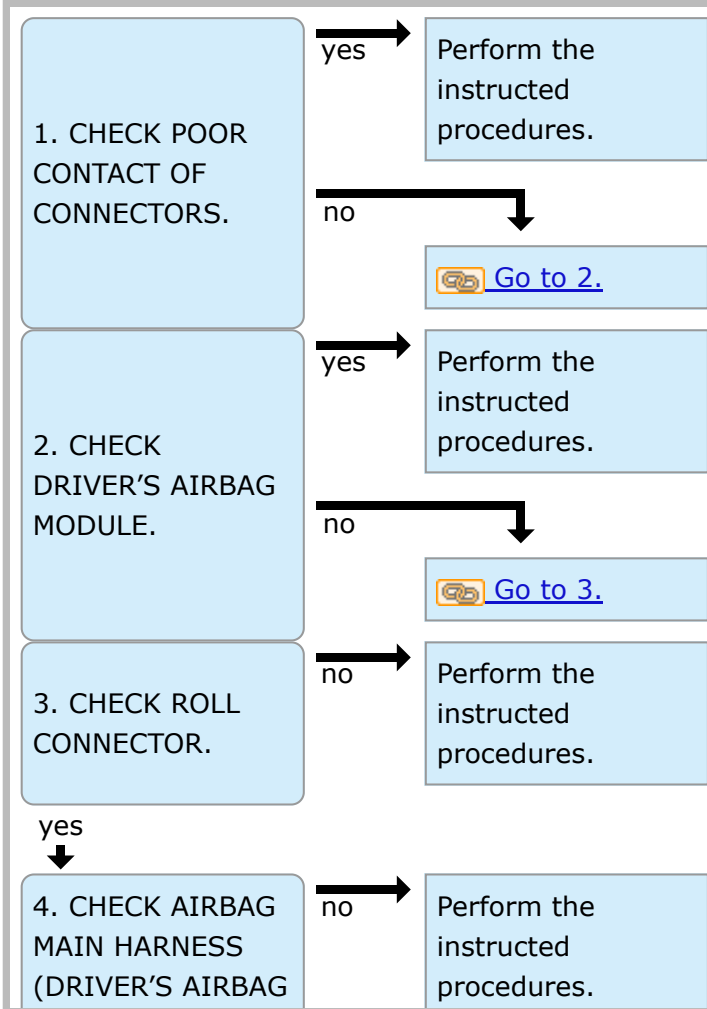
Note:

Prior to starting work, prepare two RESISTORS (98299PA040).

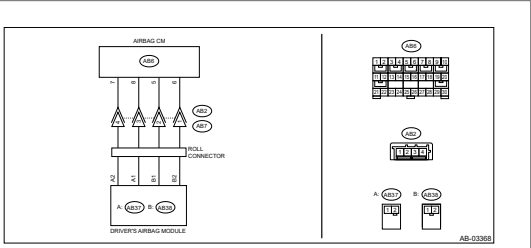
START

**AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
 DTC B1812 SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP (TO GROUND)**

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

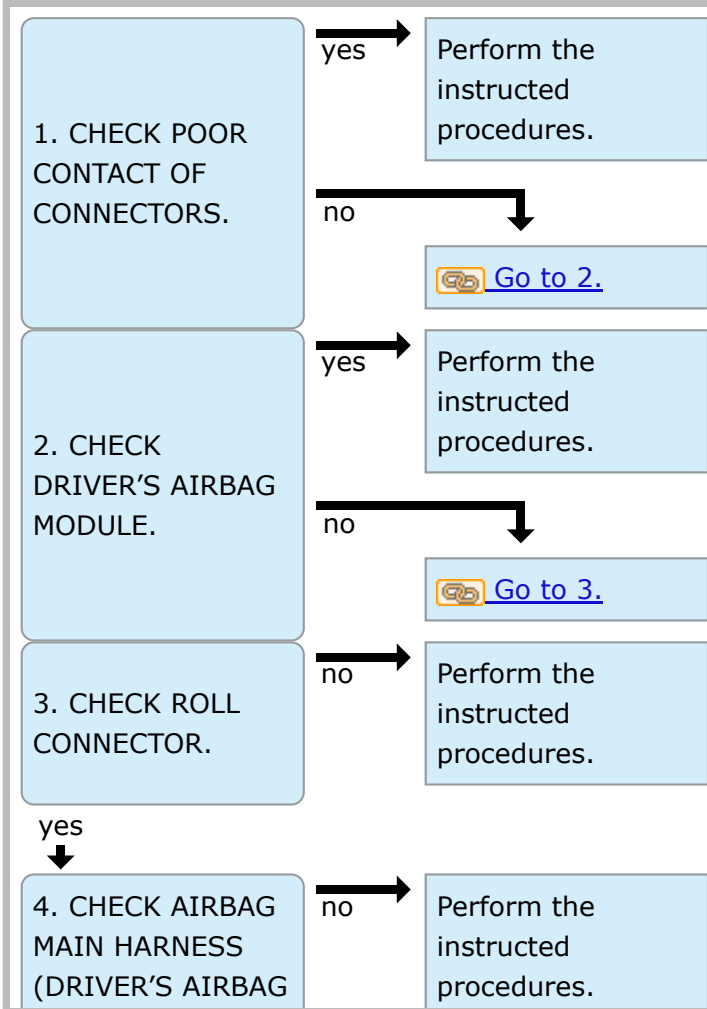
Caution:
 Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

Note:
 Prior to starting work, prepare two RESISTORS (98299PA040).

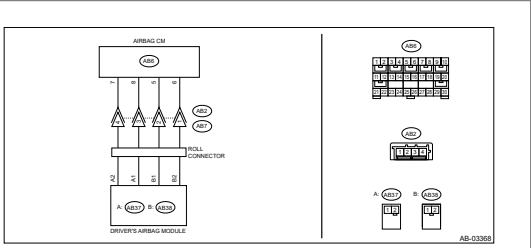
START

**AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
 DTC B1813 SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP CIRCUIT (TO +B)**

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:
 Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

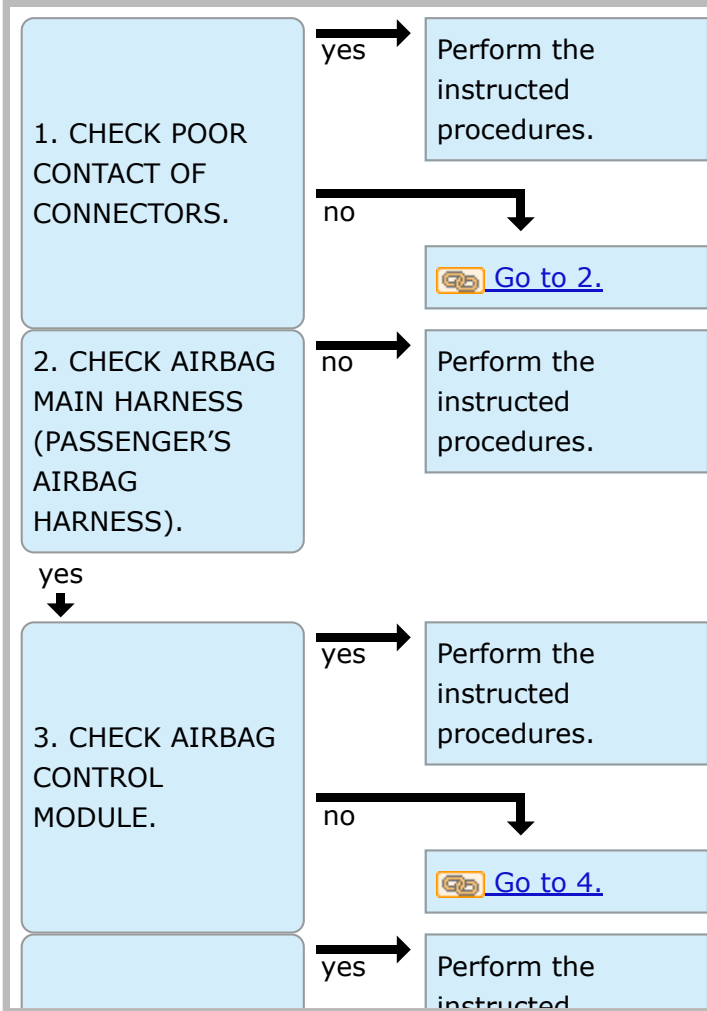
Note:
 Prior to starting work, prepare two RESISTORS (98299PA040).

START

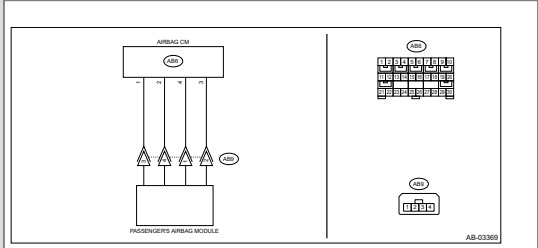
AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1815 SHORT IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

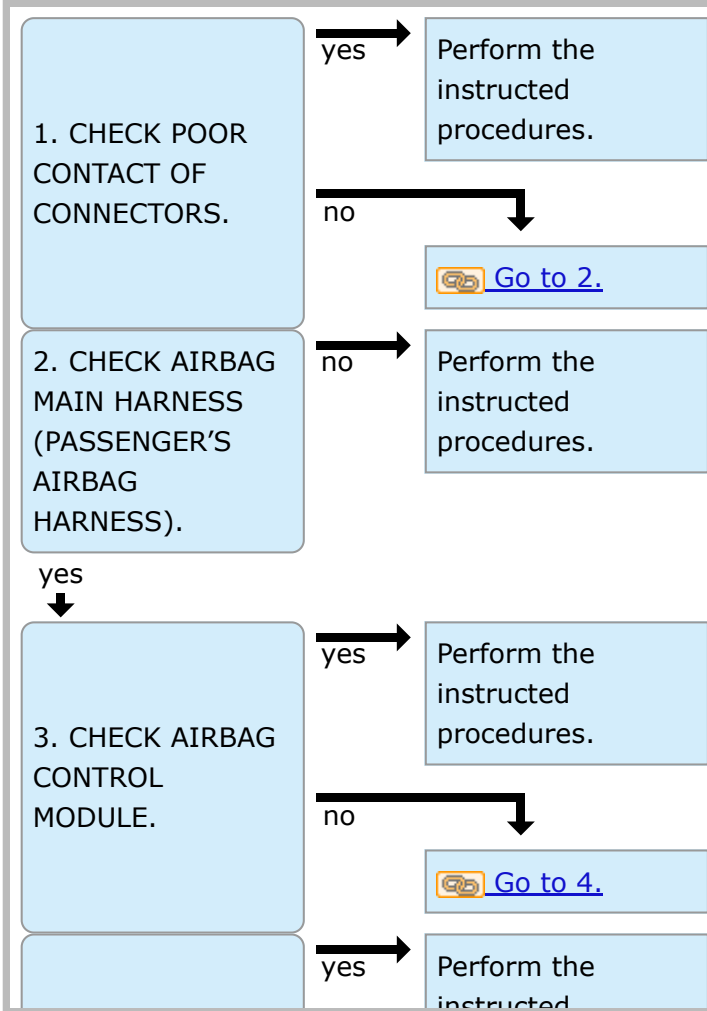
Caution:
Before performing diagnosis, refer **"CAUTION"** in **"General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.**

START

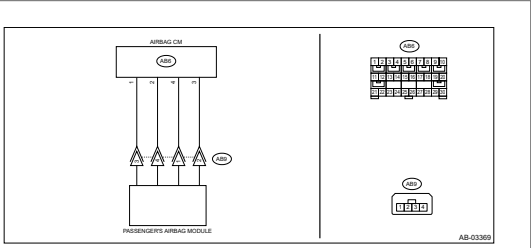
AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1816 OPEN IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



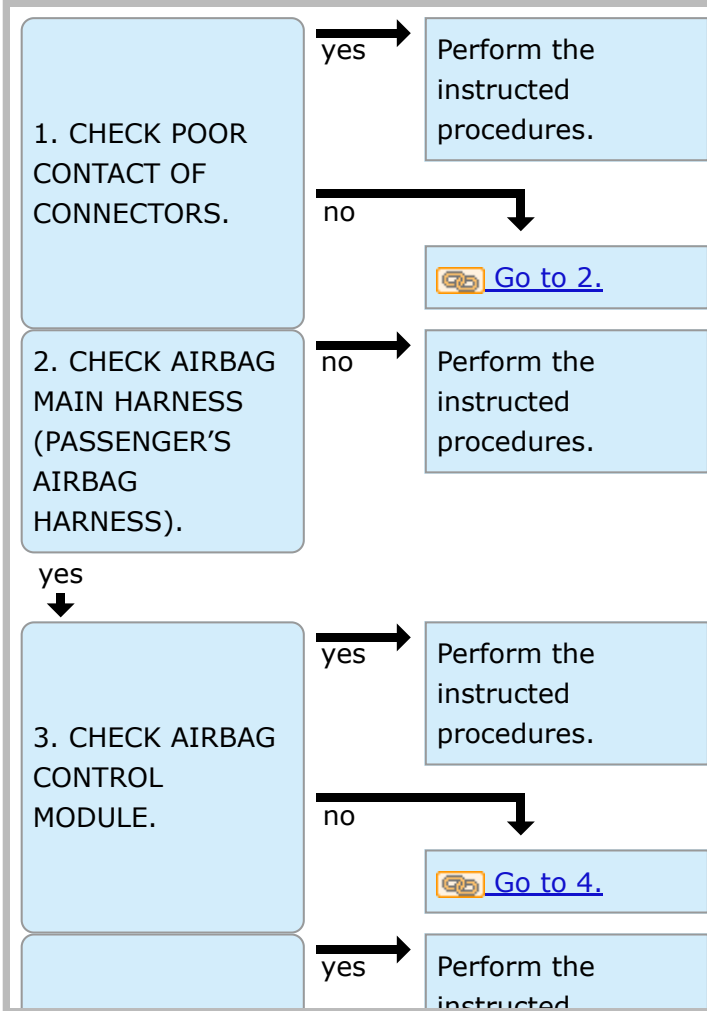
Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

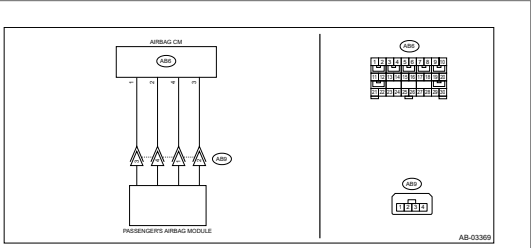
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC B1817 SHORT IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP (TO GROUND)

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

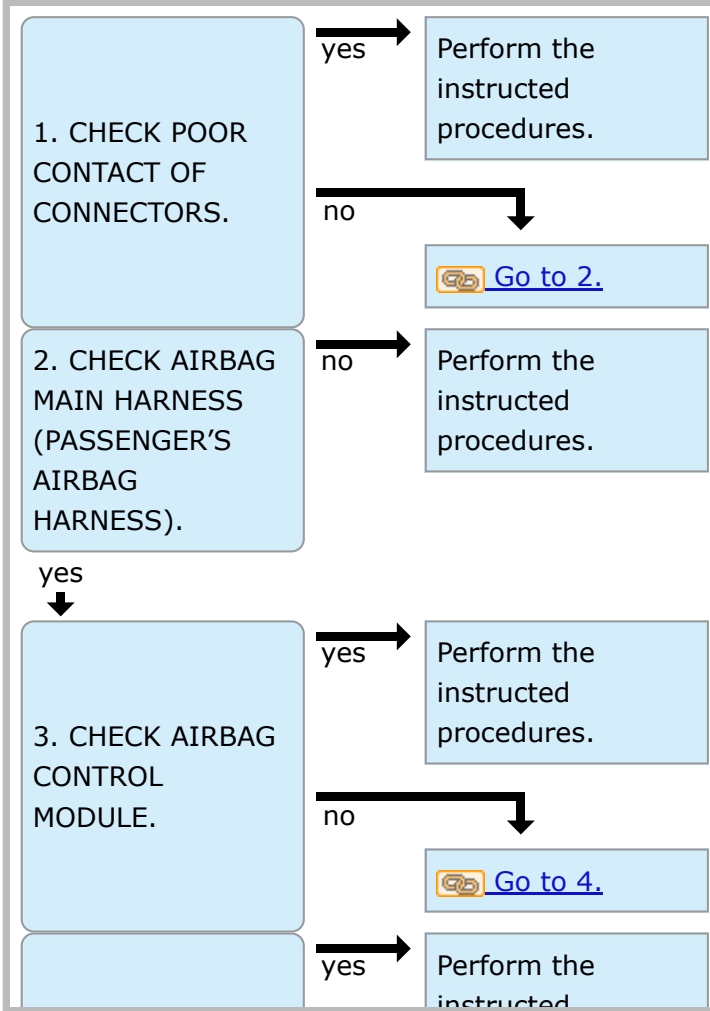
Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

START

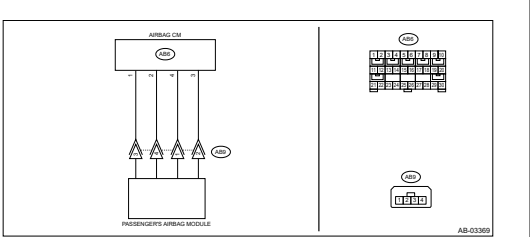
AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1818 SHORT IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP CIRCUIT (TO +B)

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

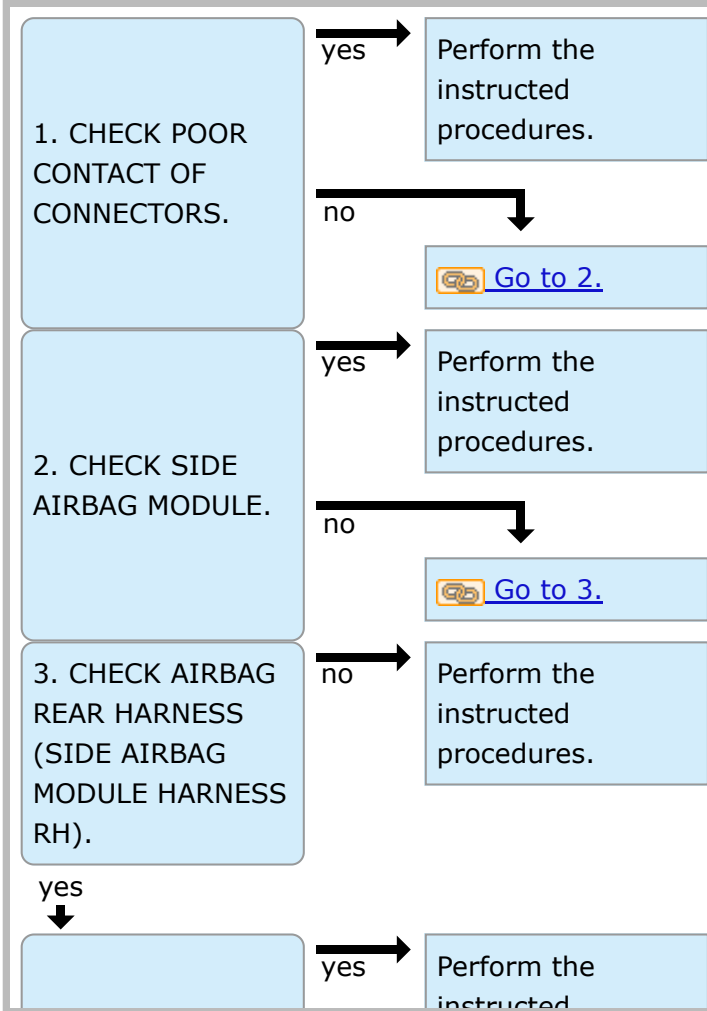
Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION."

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

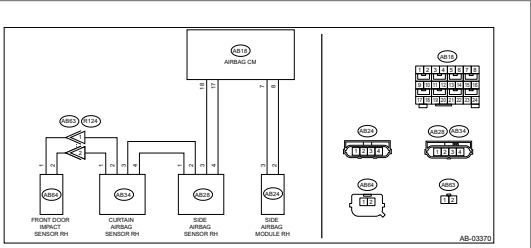
DTC B1820 SHORT IN SIDE AIRBAG RH

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

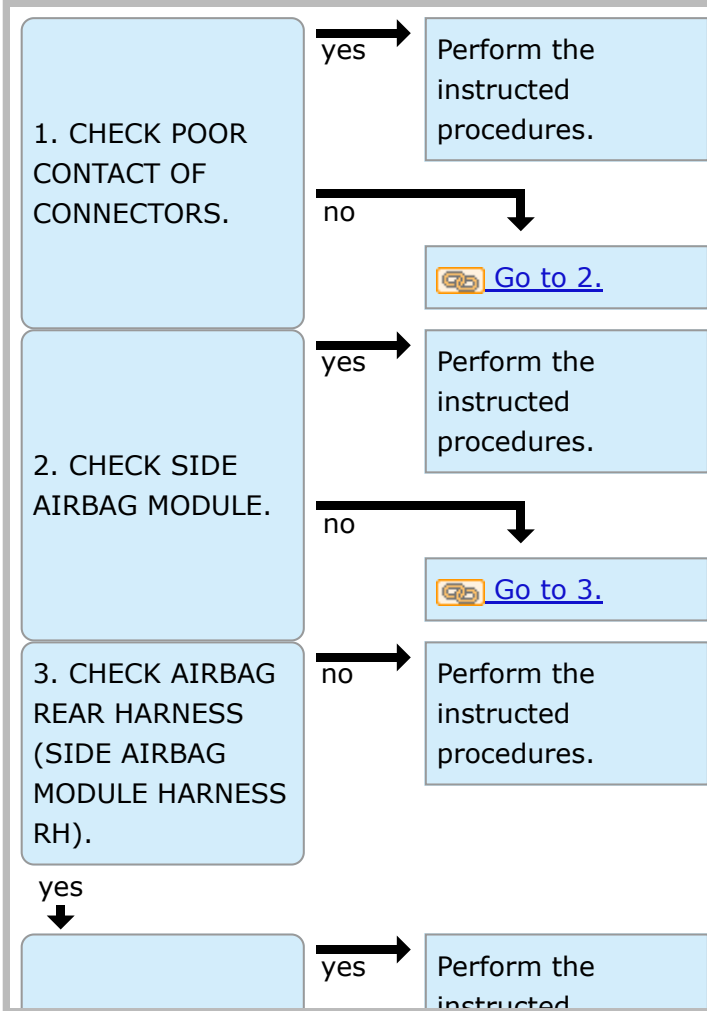
Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

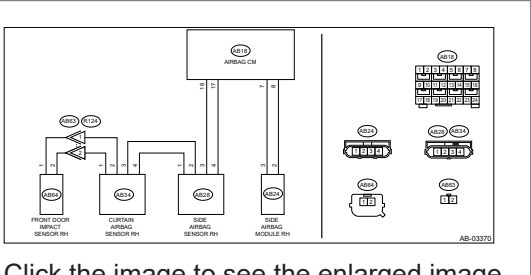
DTC B1821 OPEN IN SIDE AIRBAG RH

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



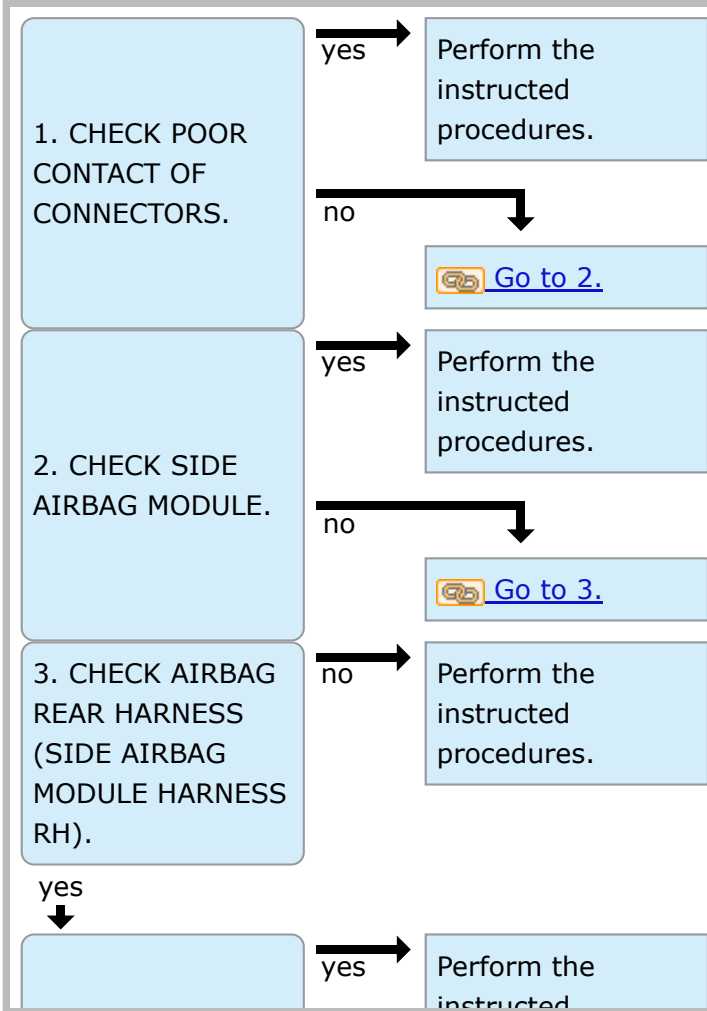
Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION."

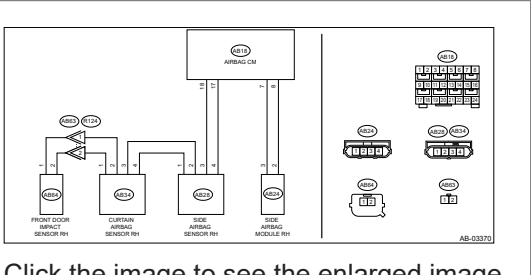
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC B1822 SHORT IN SIDE AIRBAG RH (TO GROUND)

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



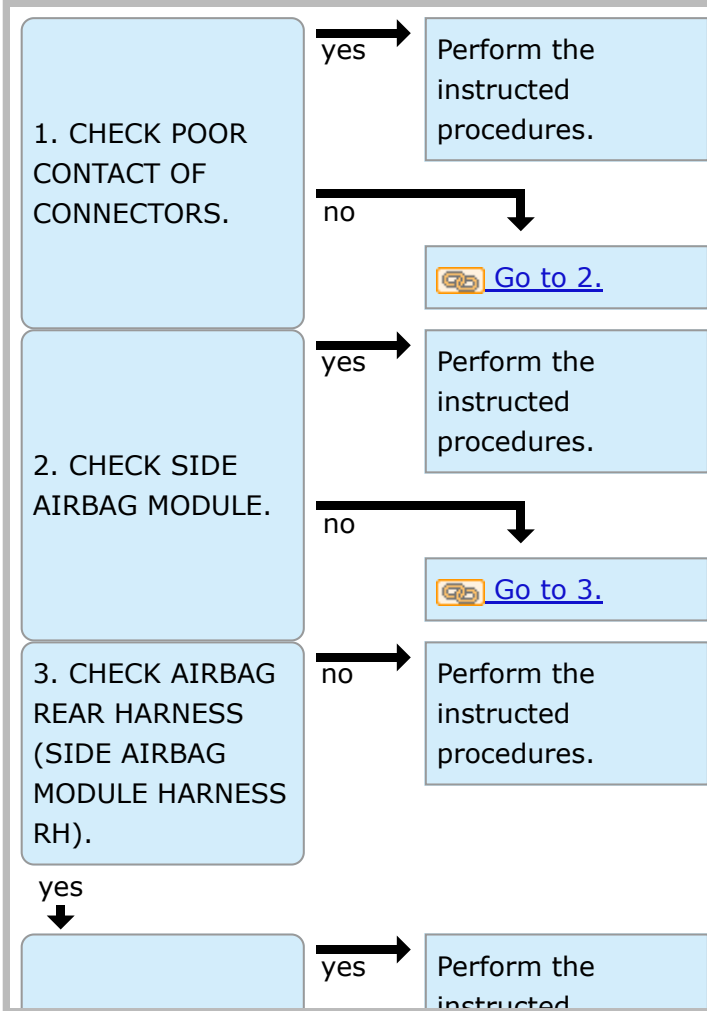
Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

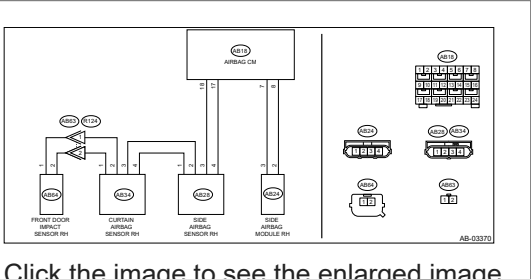
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC B1823 SHORT IN SIDE AIRBAG RH (TO +B)

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

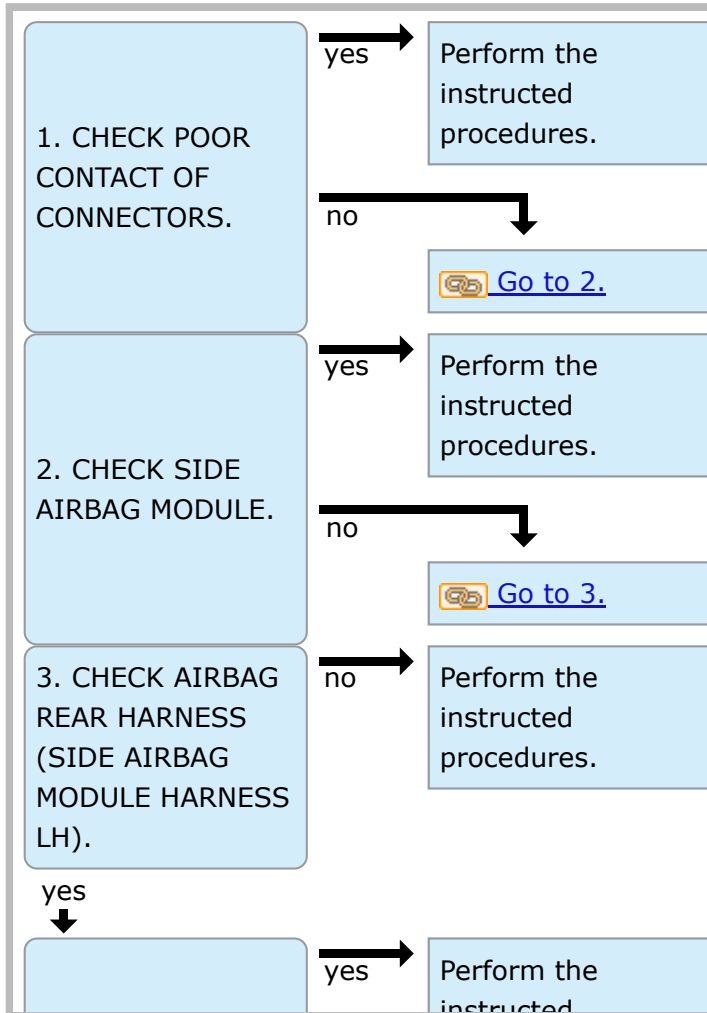
Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

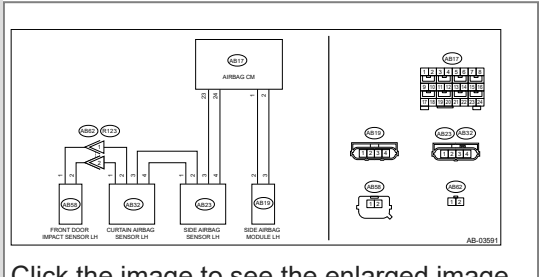
DTC B1825 SHORT IN SIDE AIRBAG LH

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:

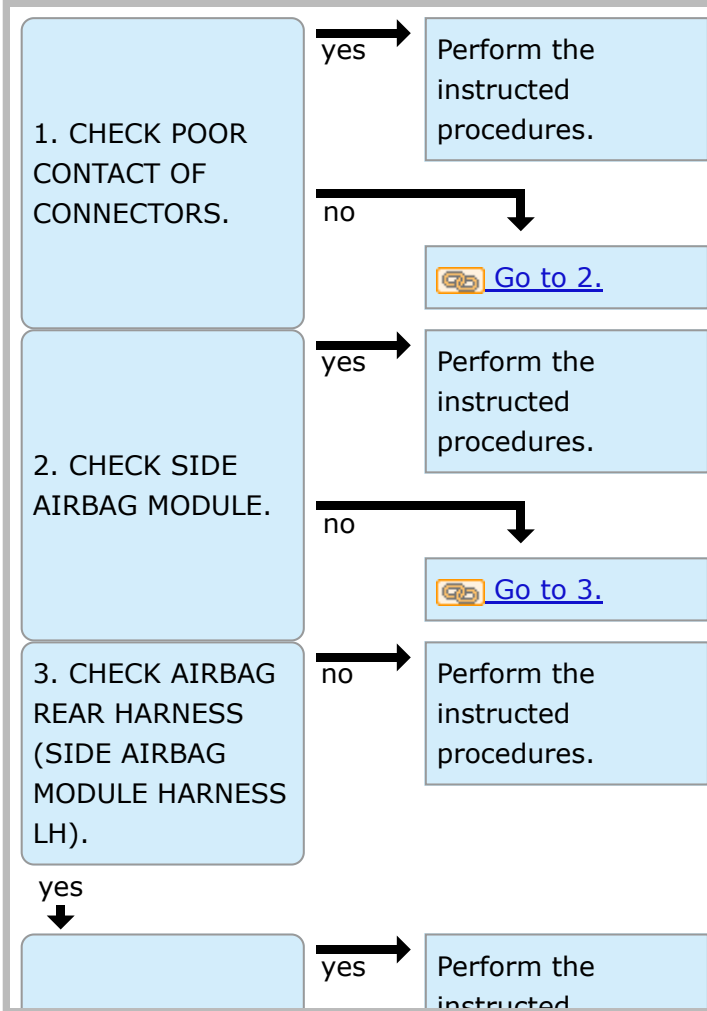
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

START

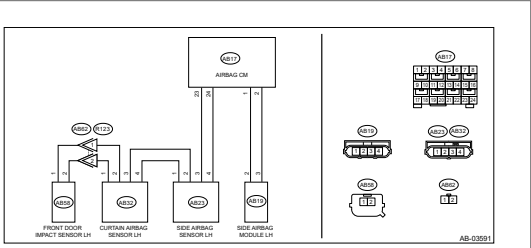
AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1826 OPEN IN SIDE AIRBAG LH

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



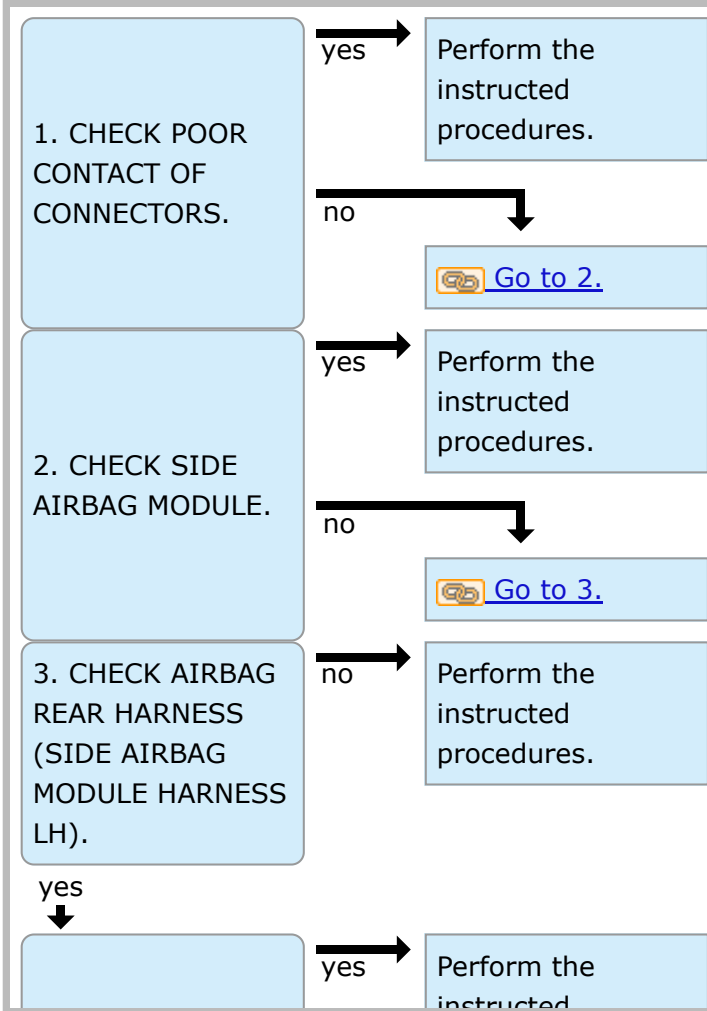
Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE."

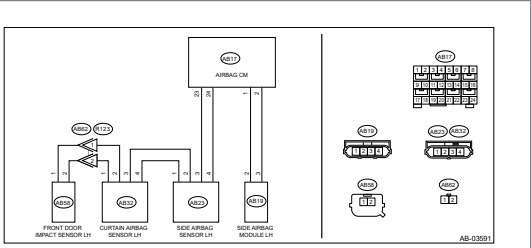
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC B1827 SHORT IN SIDE AIRBAG LH (TO GROUND)

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



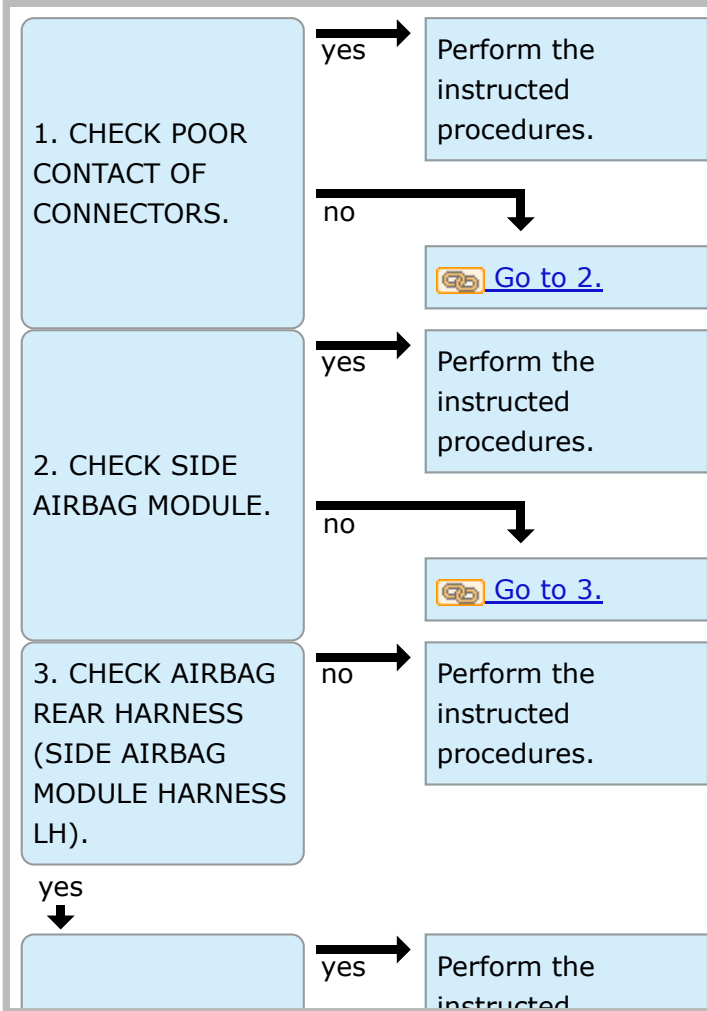
Click the image to see the enlarged image

Caution:
 Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION."

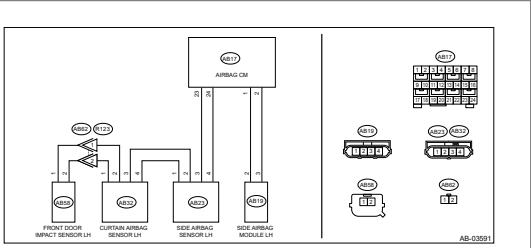
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC B1828 SHORT IN SIDE AIRBAG LH (TO +B)

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

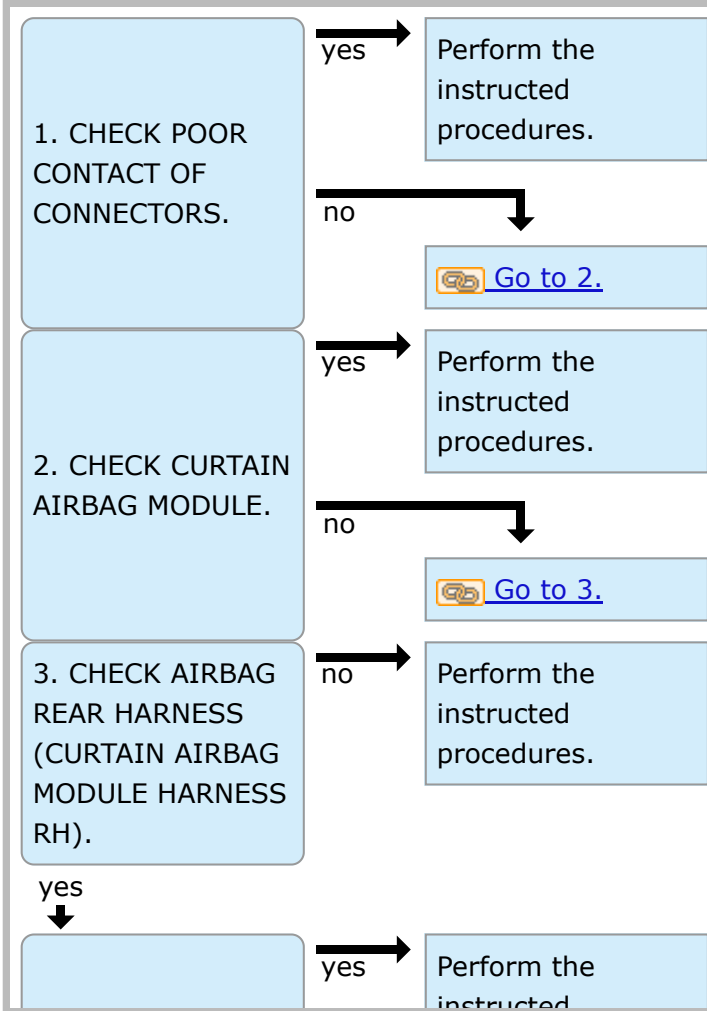
Caution:
 Before performing diagnosis, refer **"CAUTION"** in **"General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.**

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

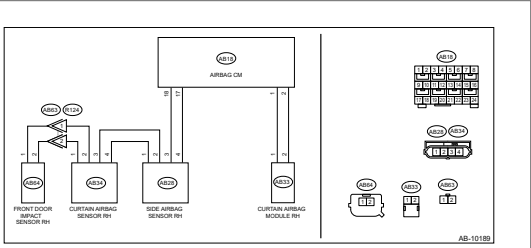
DTC B1830 SHORT IN CURTAIN AIRBAG RH SQUIB CIRCUIT

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

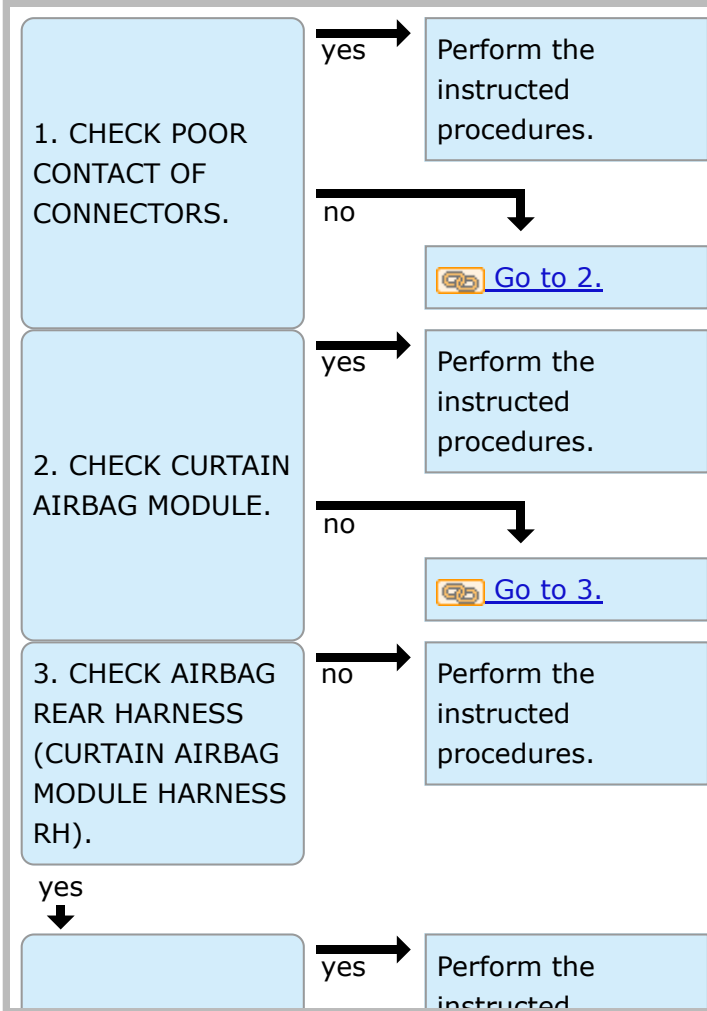
Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

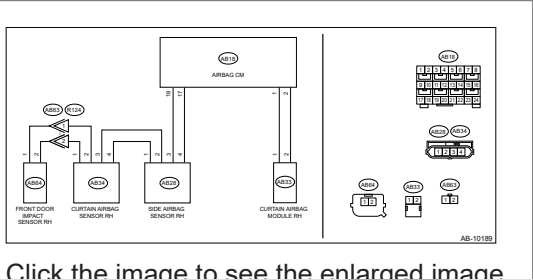
DTC B1831 OPEN IN CURTAIN AIRBAG RH SQUIB CIRCUIT

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



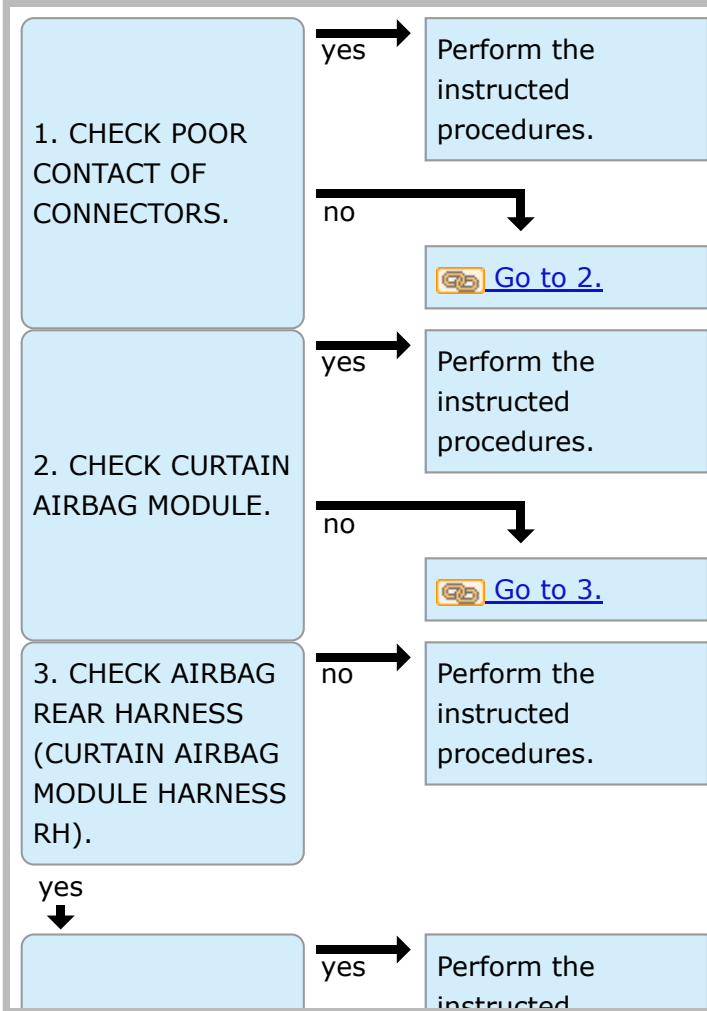
Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

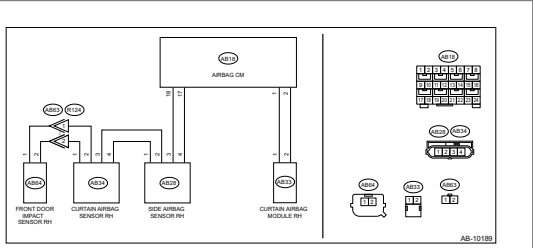
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC B1832 SHORT IN CURTAIN AIRBAG RH SQUIB CIRCUIT (TO GROUND)

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



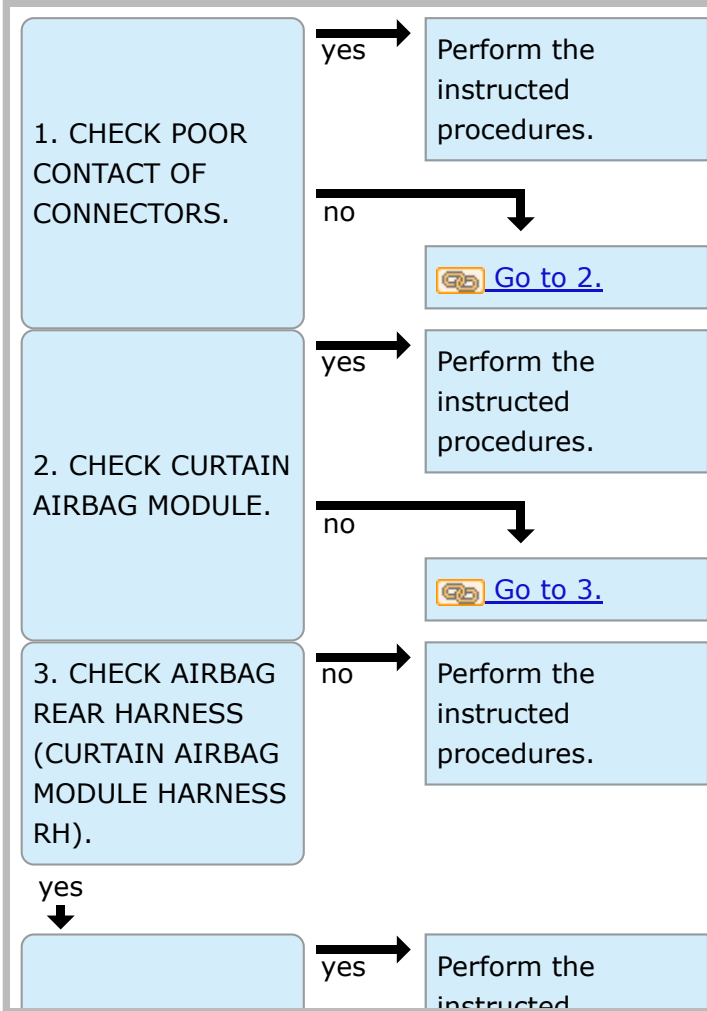
Click the image to see the enlarged image

Caution:
 Before performing diagnosis, refer **"CAUTION"** in **"General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.**

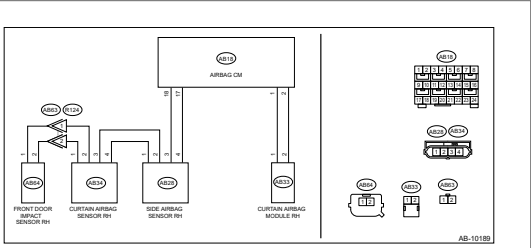
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC B1833 SHORT IN CURTAIN SHIELD AIRBAG RH SQUIB CIRCUIT (TO +B)

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

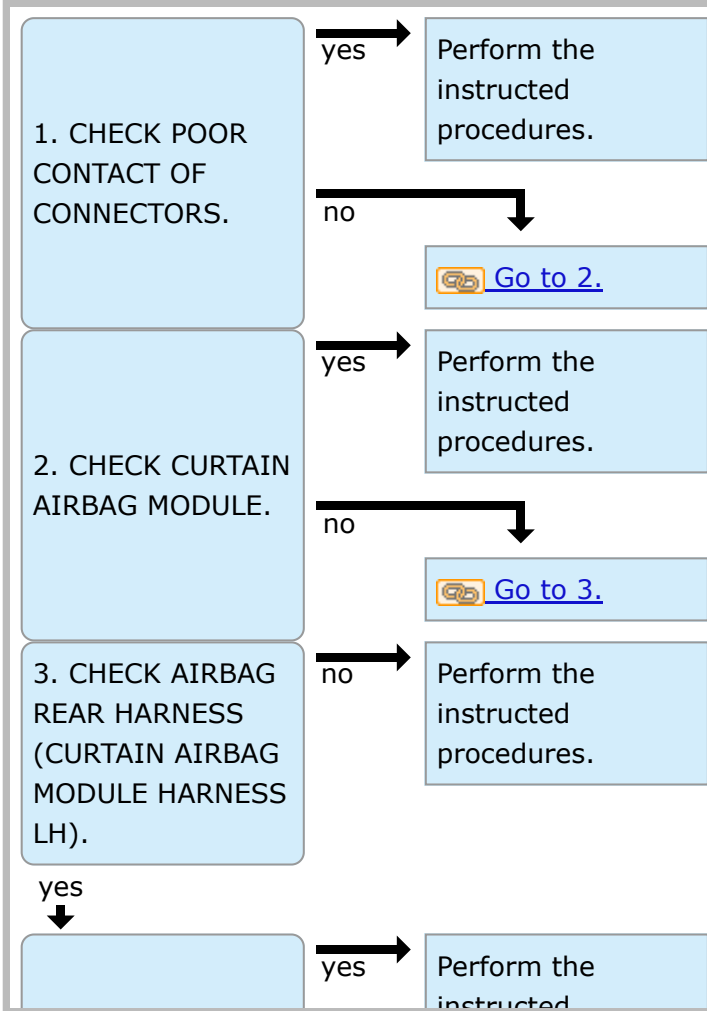
Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

START

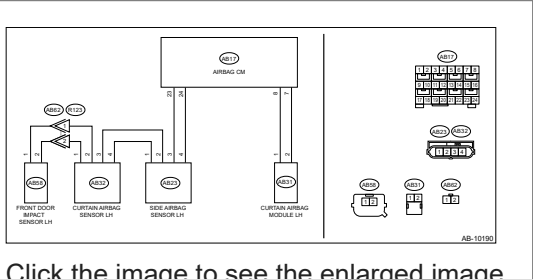
AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1835 SHORT IN CURTAIN AIRBAG LH SQUIB CIRCUIT

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

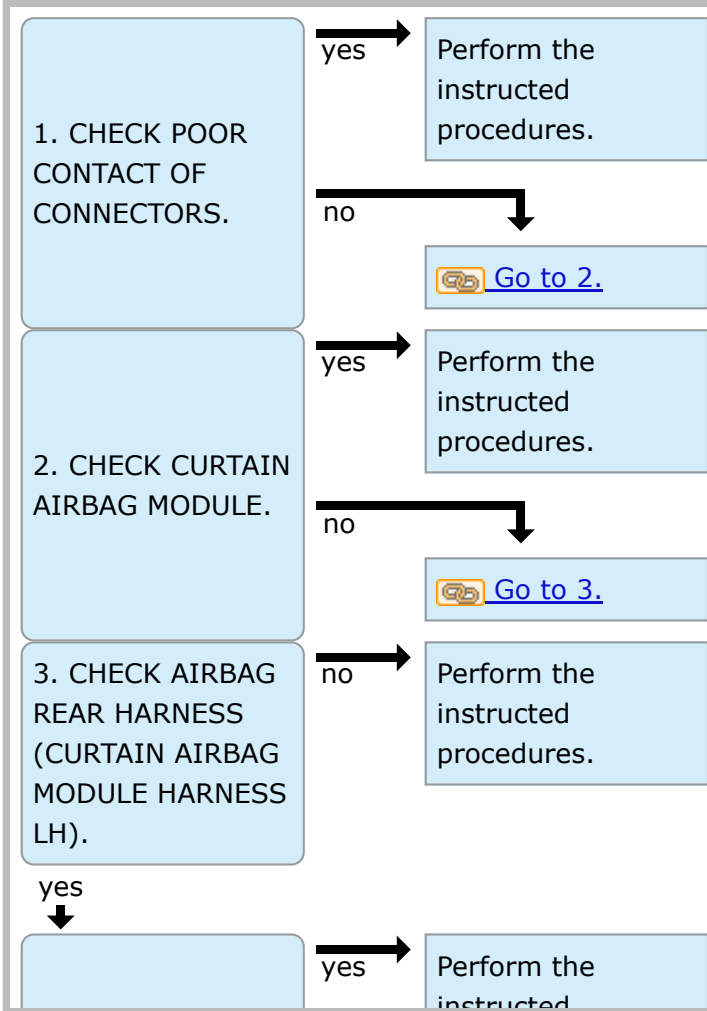
Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

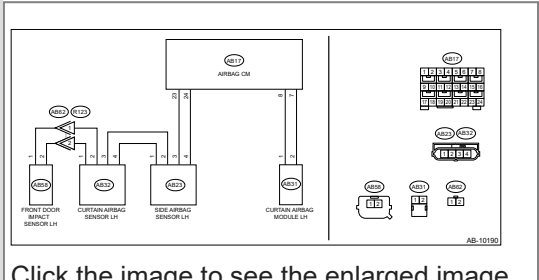
DTC B1836 OPEN IN CURTAIN AIRBAG LH SQUIB CIRCUIT

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

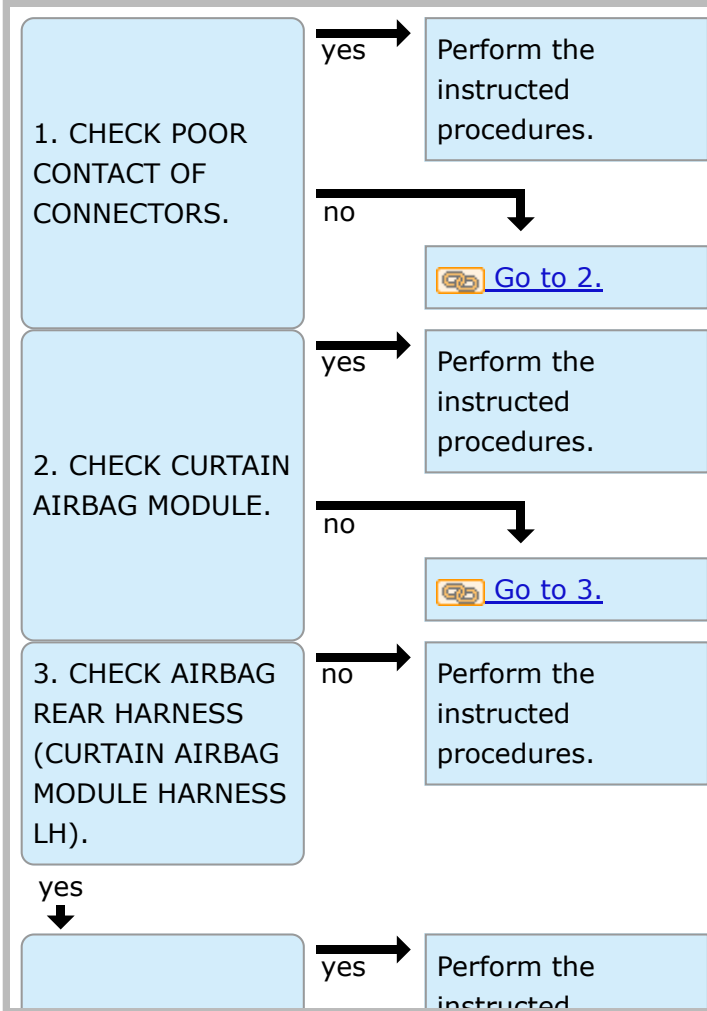
Caution:

Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

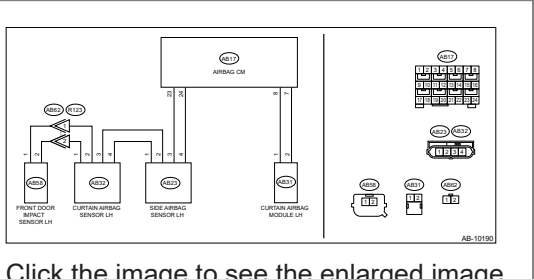
START

**AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
 DTC B1837 SHORT IN CURTAIN AIRBAG LH SQUIB CIRCUIT (TO GROUND)**

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



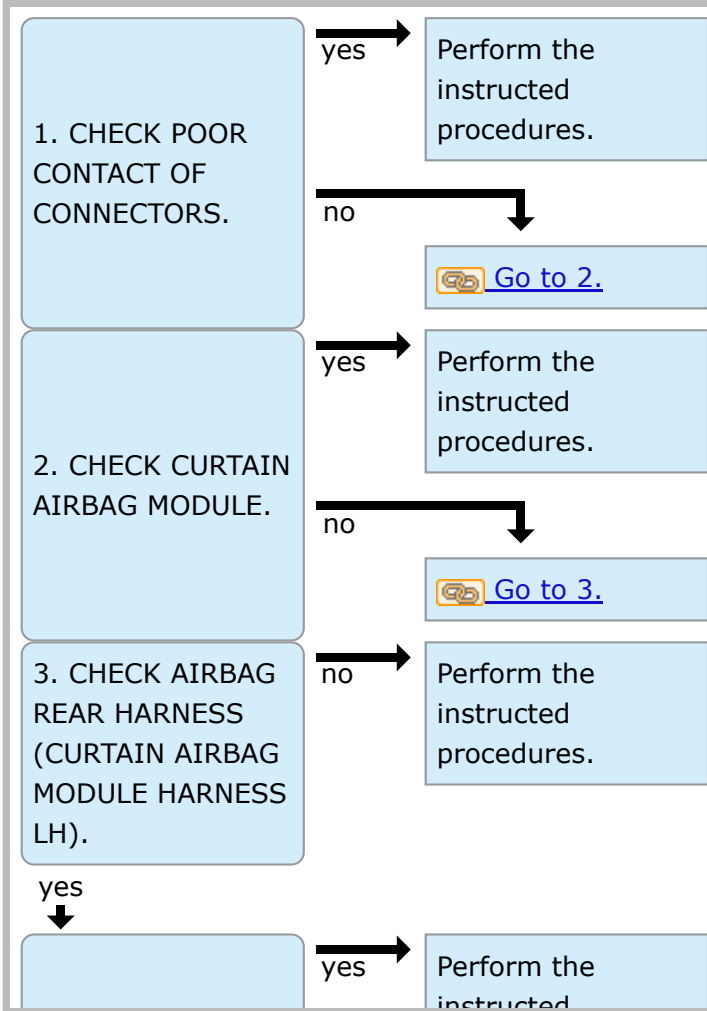
Click the image to see the enlarged image

Caution:
 Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

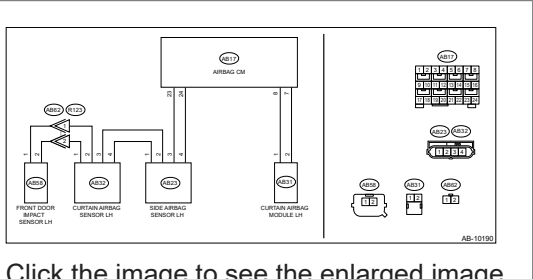
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC B1838 SHORT IN CURTAIN SHIELD AIRBAG LH SQUIB CIRCUIT (TO +B)

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

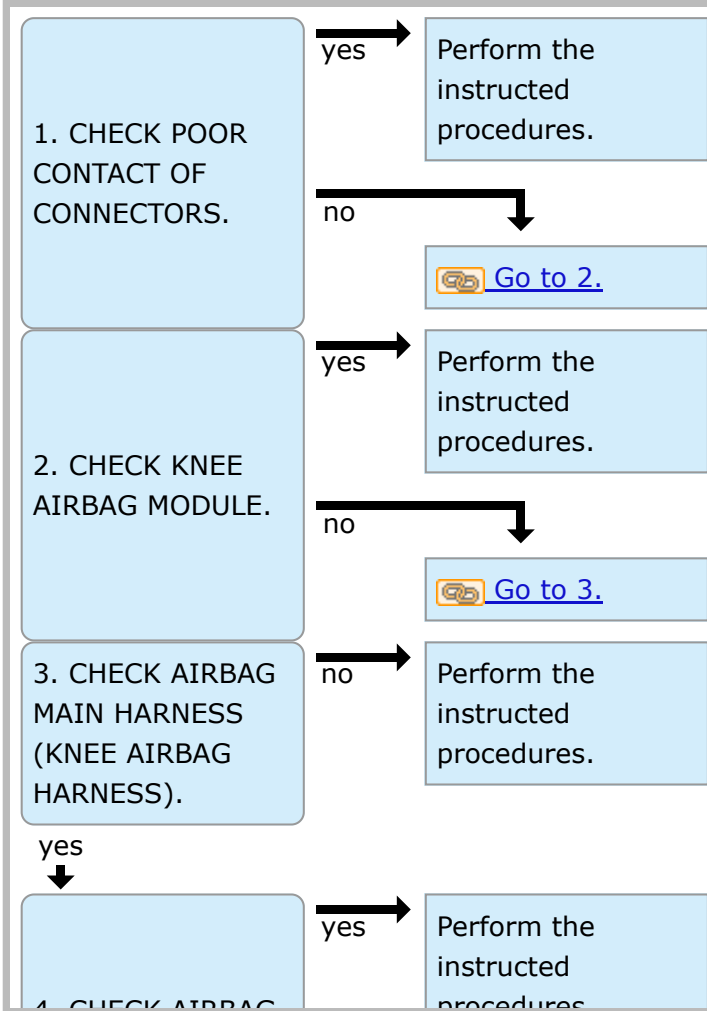
Caution:
 Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

START

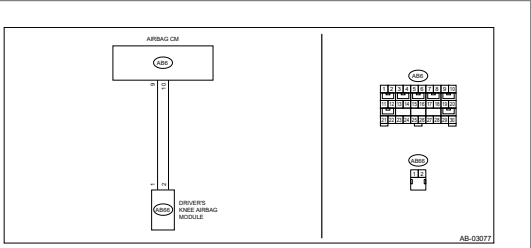
AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1860 SHORT IN DRIVER'S KNEE AIRBAG

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

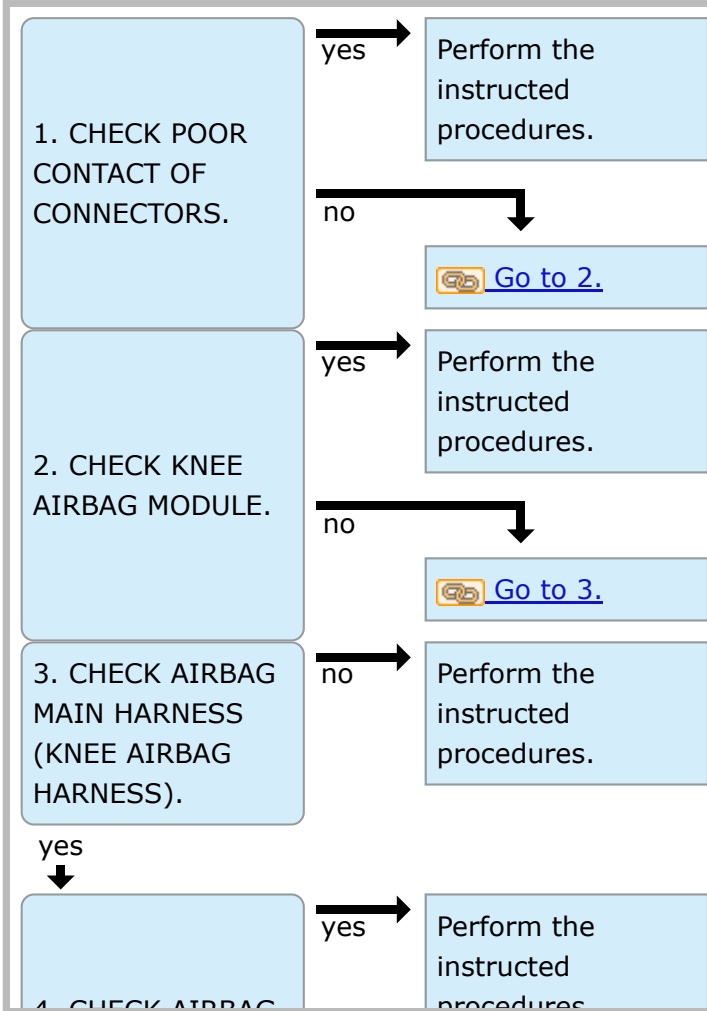
Caution:
Before performing diagnosis, refer **"CAUTION"** in **"General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.**

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

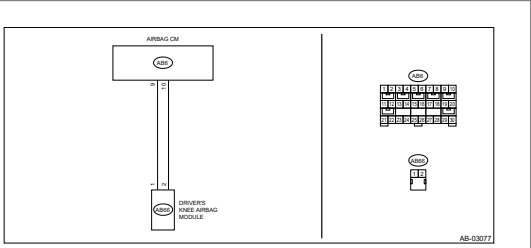
DTC B1861 OPEN IN DRIVER'S KNEE AIRBAG

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



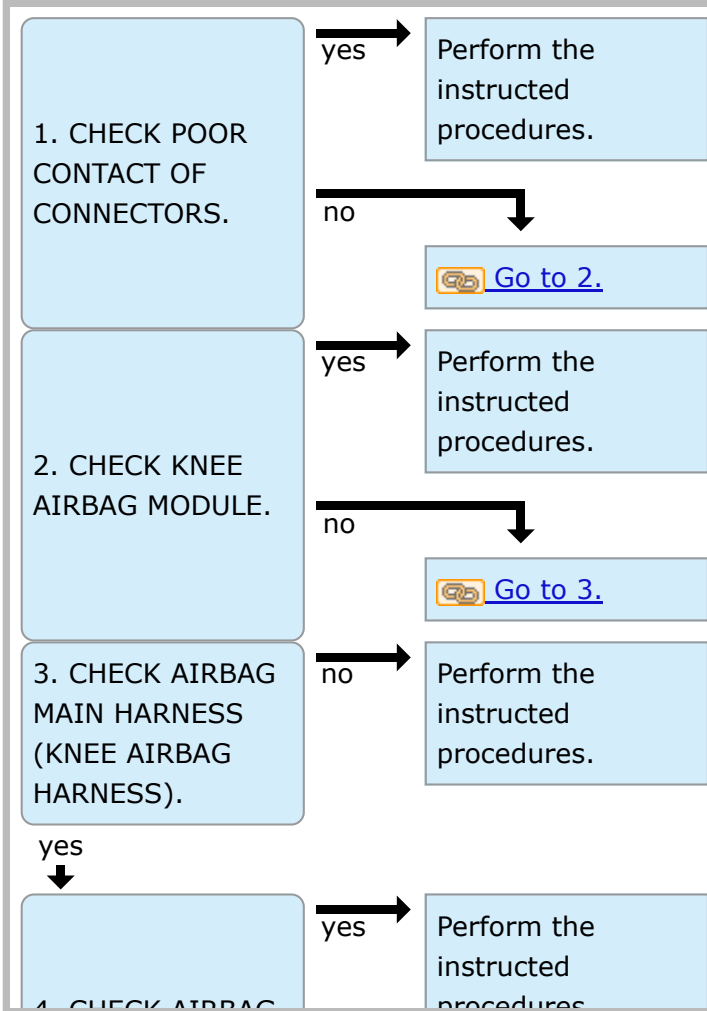
Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION."

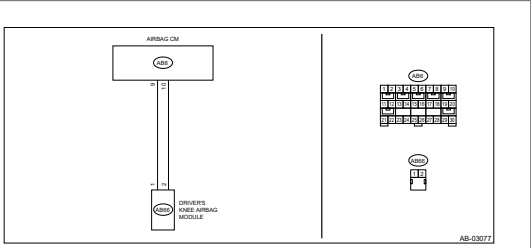
START

**AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC B1862 SHORT IN DRIVER'S KNEE AIRBAG (TO GROUND)**

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



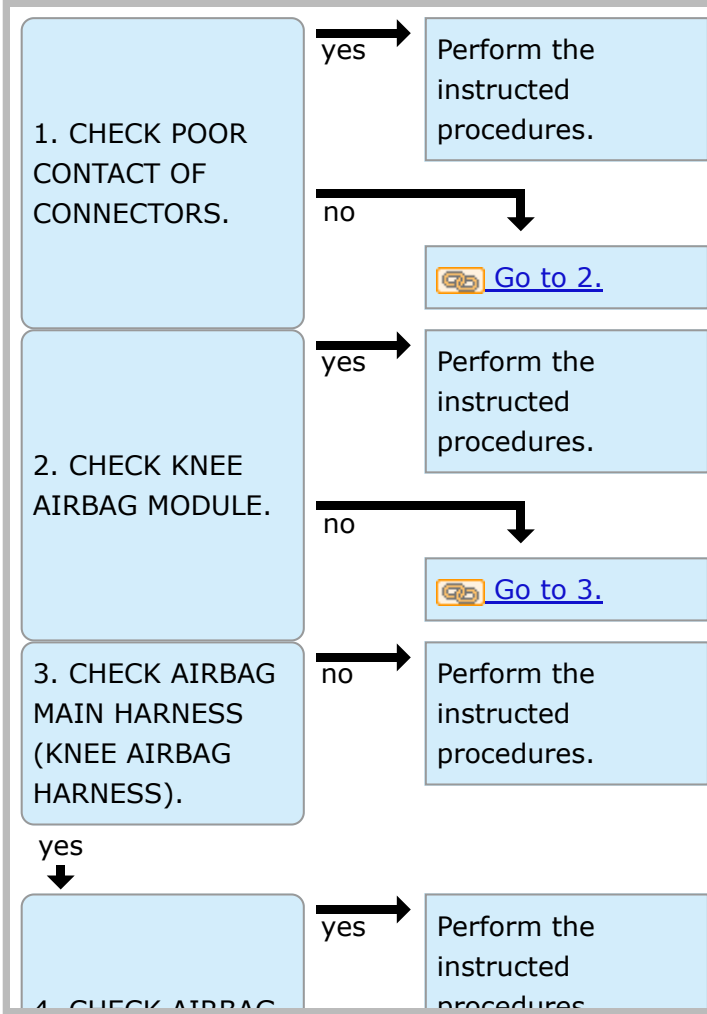
Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

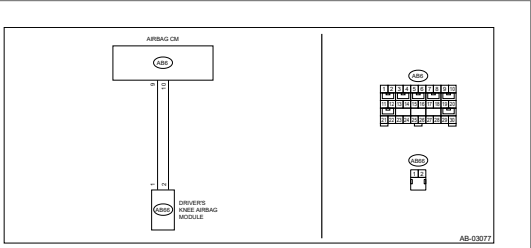
START

**AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC B1863 SHORT IN DRIVER'S KNEE AIRBAG (TO +B)**

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

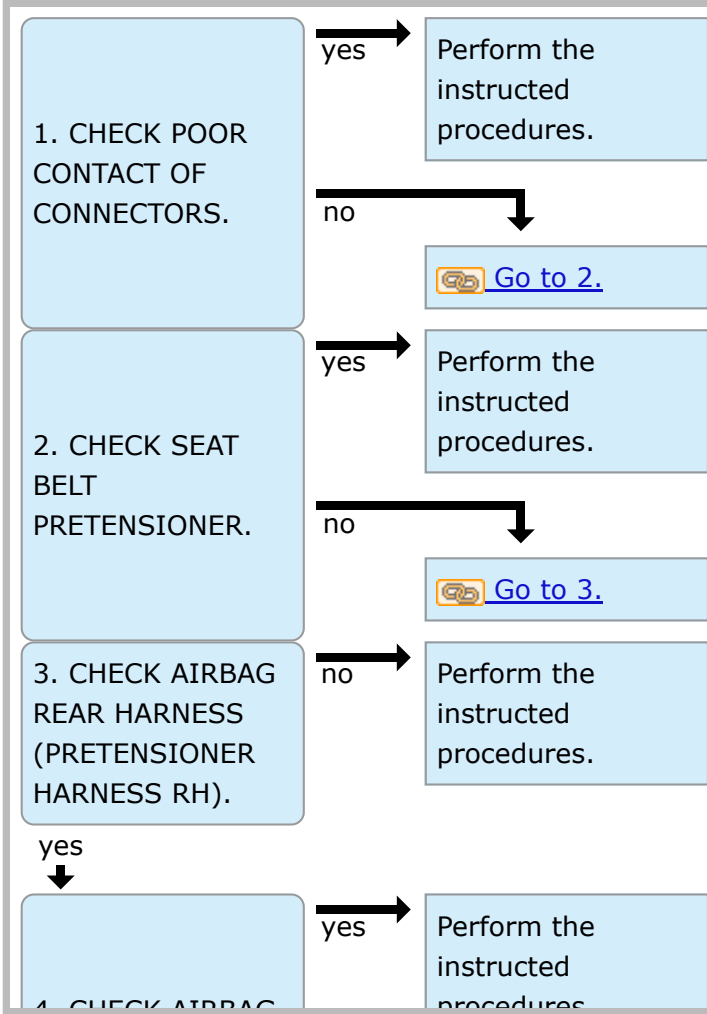
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1900 SHORT IN FRONT P/T RH

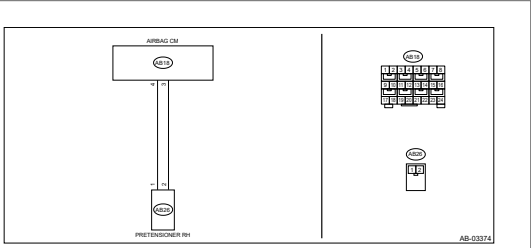
CAUTION/NOTE

INTRO



Wiring diagram:

Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

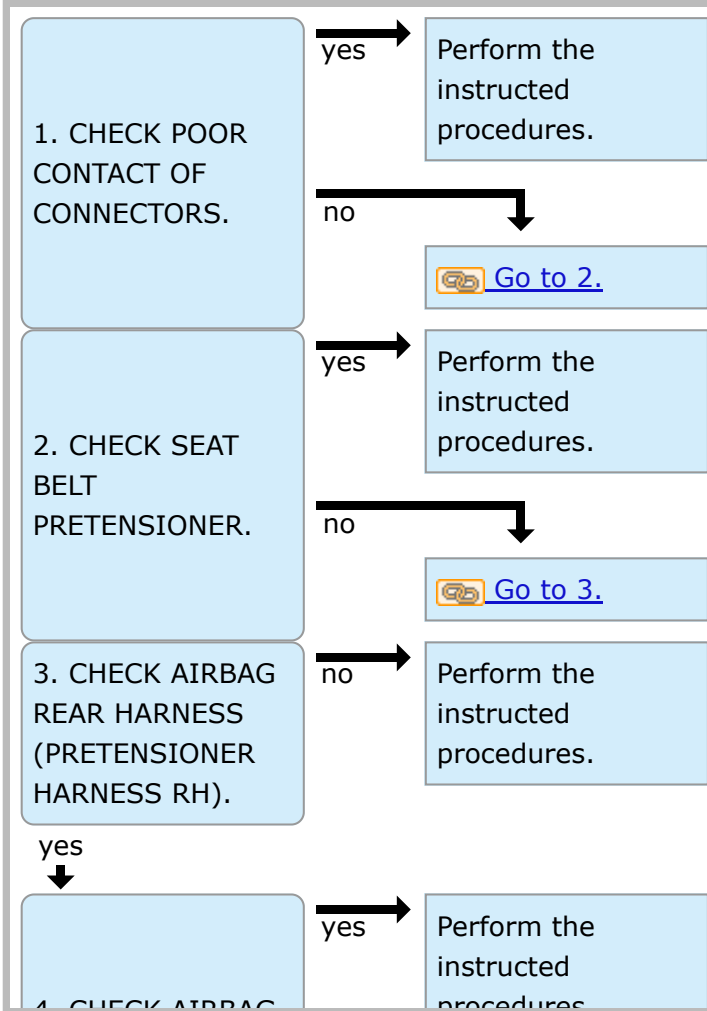
Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

START

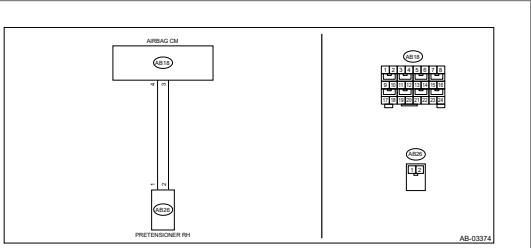
AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1901 OPEN IN FRONT P/T RH

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



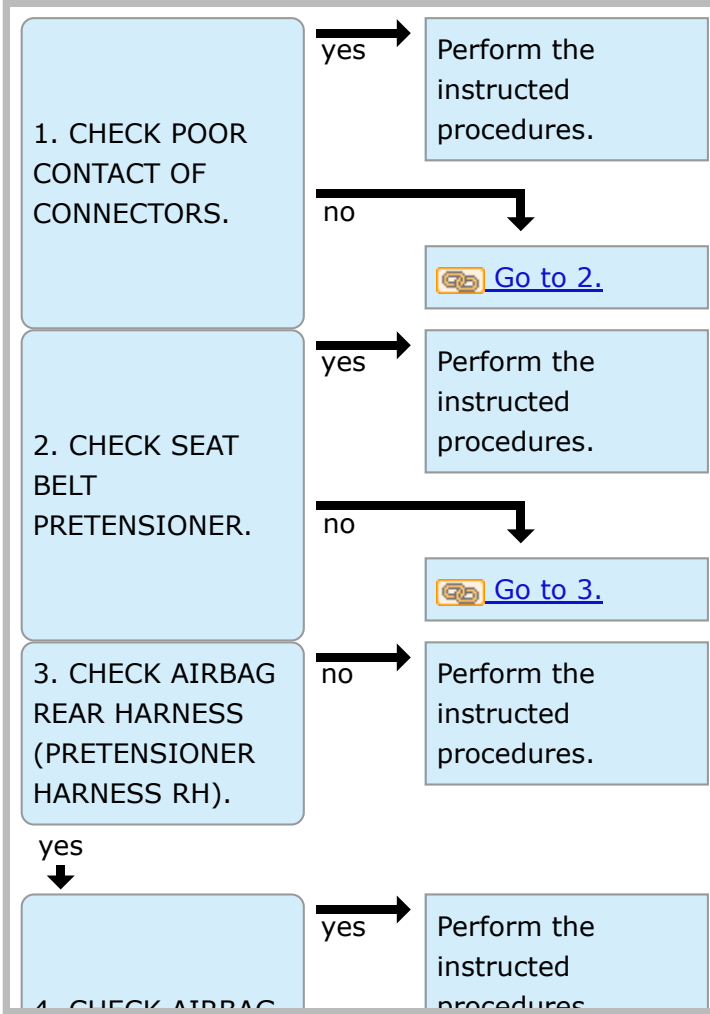
Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION."

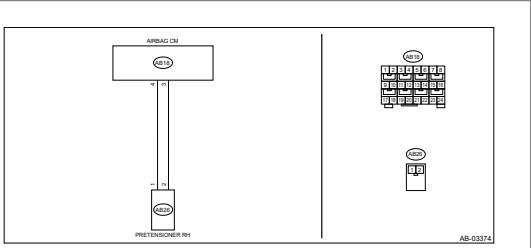
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC B1902 SHORT IN FRONT P/T RH (TO GROUND)

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1903 SHORT IN FRONT P/T RH (TO +B)

[CAUTION/NOTE](#) [INTRO](#)

1. CHECK POOR CONTACT OF CONNECTORS.

yes → Perform the instructed procedures.

no → [Go to 2.](#)

2. CHECK SEAT BELT PRETENSIONER.

yes → Perform the instructed procedures.

no → [Go to 3.](#)


3. CHECK AIRBAG REAR HARNESS (PRETENSIONER HARNESS RH).

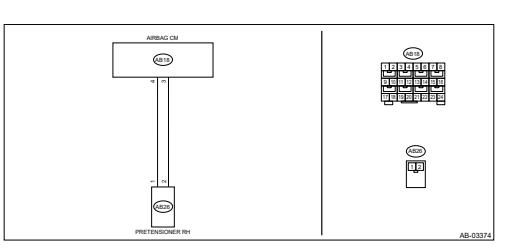
no → Perform the instructed procedures.

yes ↓

4. CHECK AIRBAG

yes → Perform the instructed procedures.

Wiring diagram:
Airbag system  [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

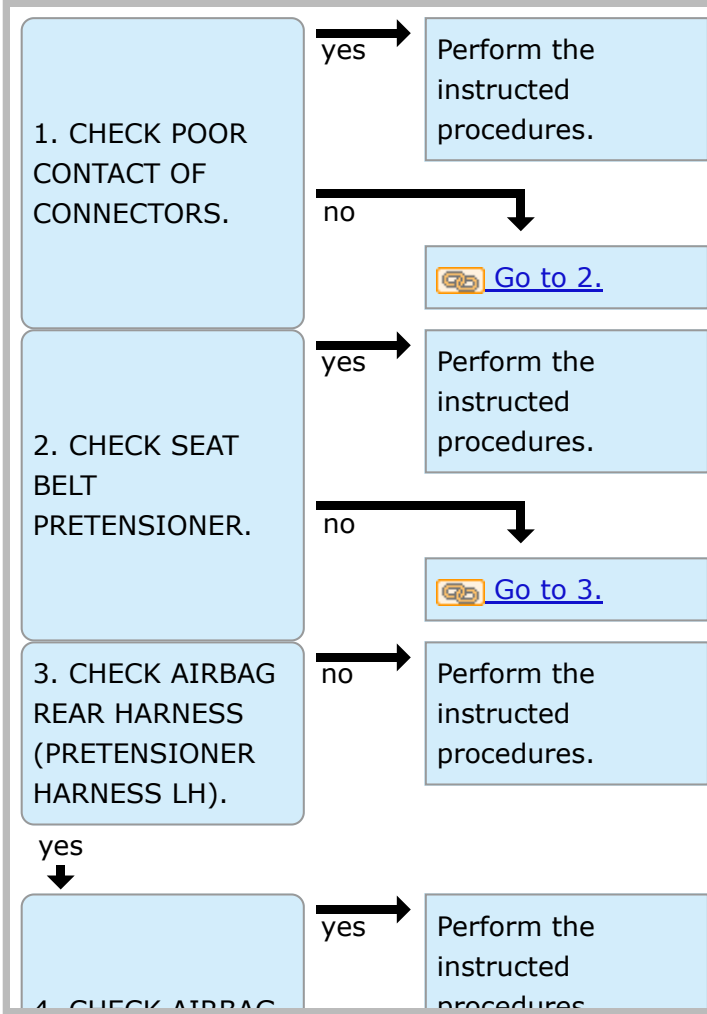
Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

START

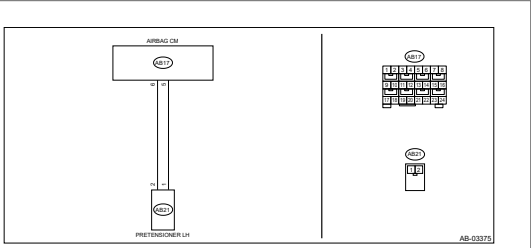
AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1905 SHORT IN FRONT P/T LH

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer **"CAUTION"** in **"General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.**

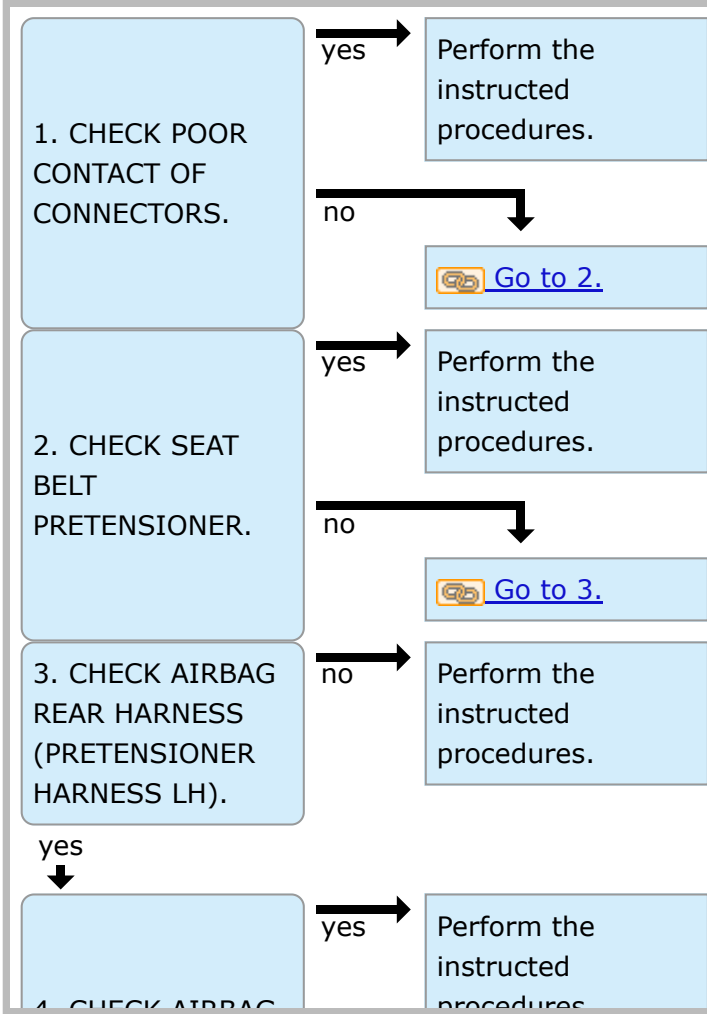
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1906 OPEN IN FRONT P/T LH

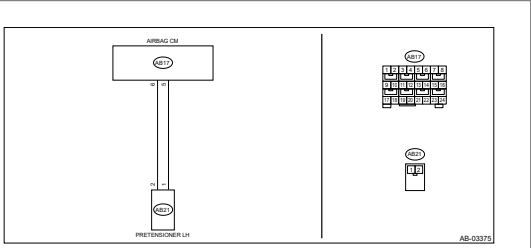
CAUTION/NOTE

INTRO



Wiring diagram:

Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



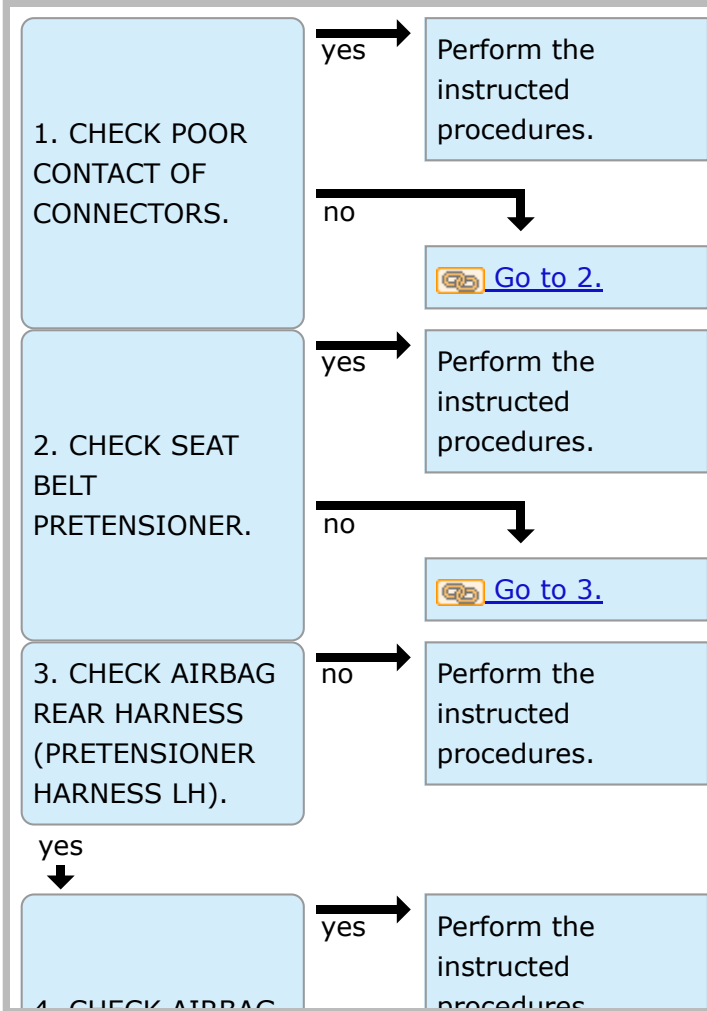
Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

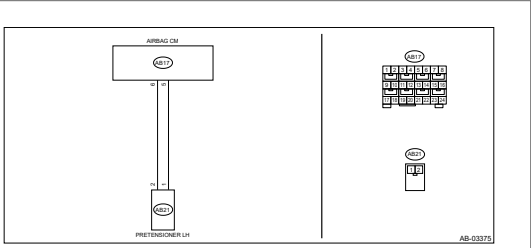
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC B1907 SHORT IN FRONT P/T LH (TO GROUND)

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:
 Before performing diagnosis, refer **"CAUTION"** in **"General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.**

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1908 SHORT IN FRONT P/T LH (TO +B)

[CAUTION/NOTE](#) [INTRO](#)

1. CHECK POOR CONTACT OF CONNECTORS.

yes → Perform the instructed procedures.

no → [Go to 2.](#)

2. CHECK SEAT BELT PRETENSIONER.

yes → Perform the instructed procedures.

no → [Go to 3.](#)

3. CHECK AIRBAG REAR HARNESS (PRETENSIONER HARNESS LH).


no → Perform the instructed procedures.

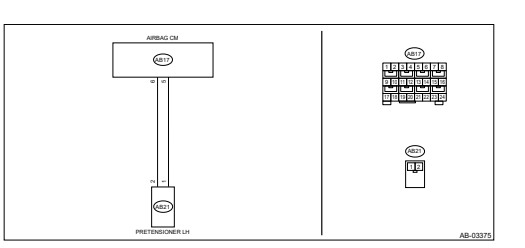
yes ↓

4. CHECK AIRBAG

yes → Perform the instructed procedures.

Wiring diagram:

Airbag system  [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:

Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

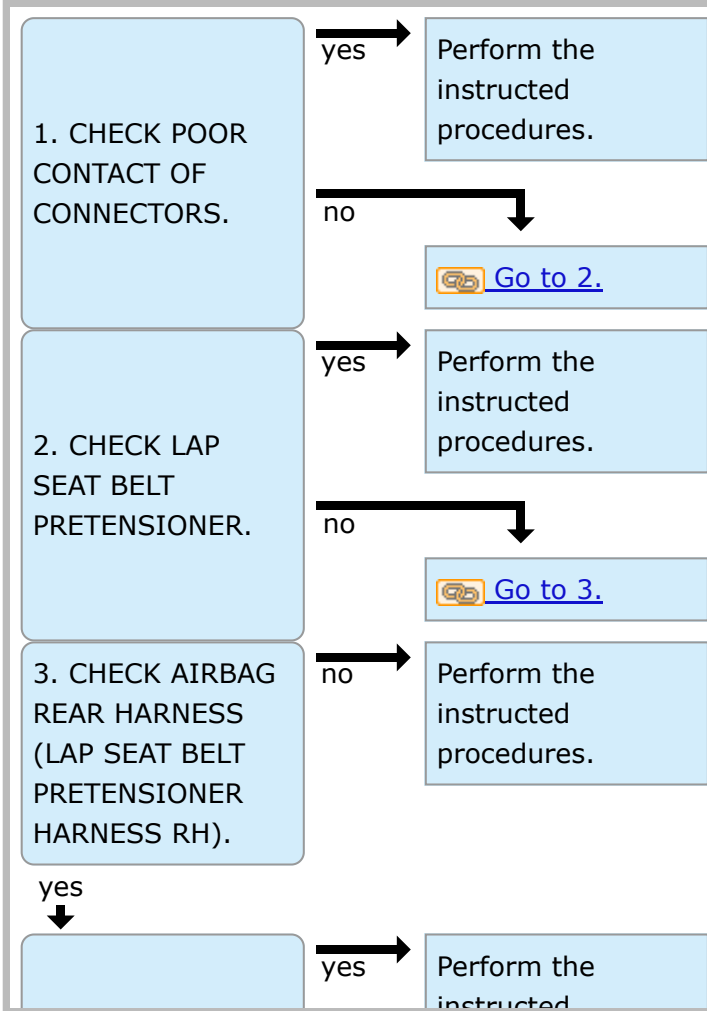
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B19F0 SHORT IN FRONT P/T 2 RH

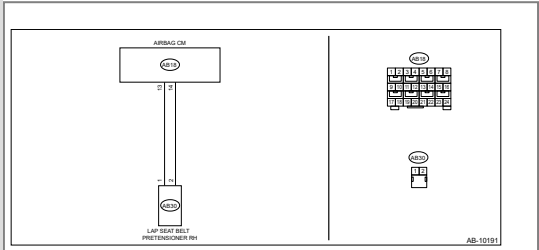
CAUTION/NOTE

INTRO



Wiring diagram:

Airbag system Ref. to [WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:

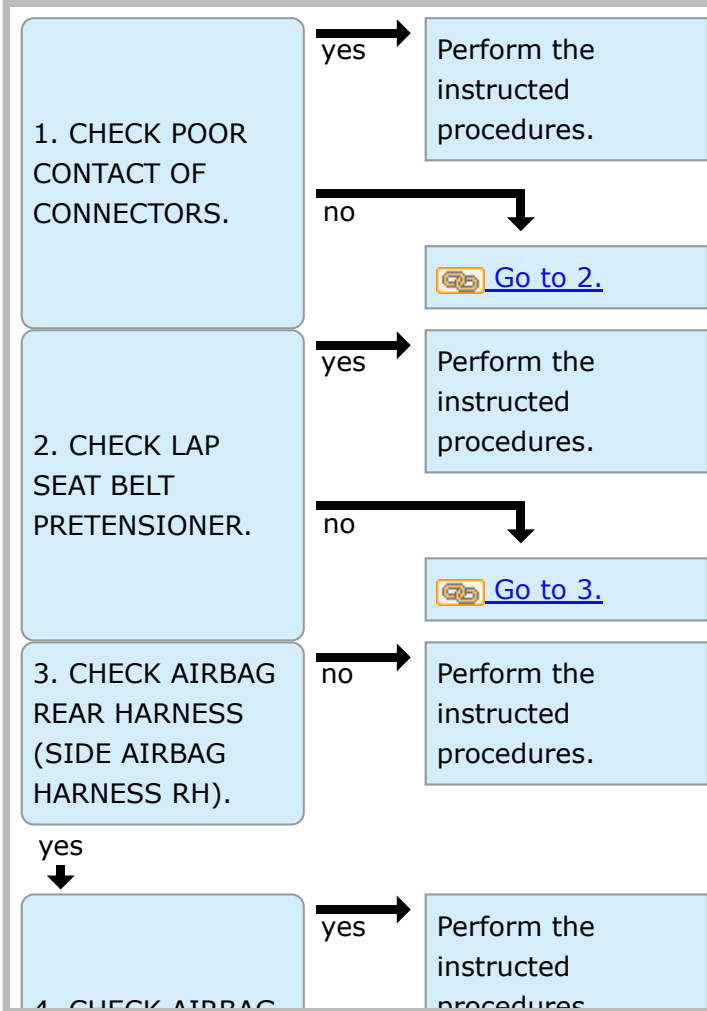
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

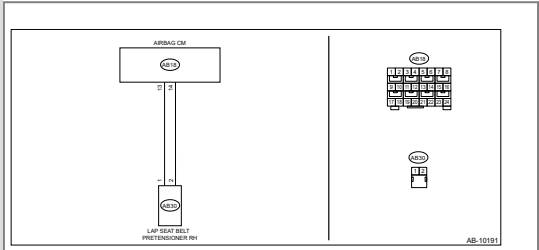
DTC B19F1 OPEN IN FRONT P/T 2 RH

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

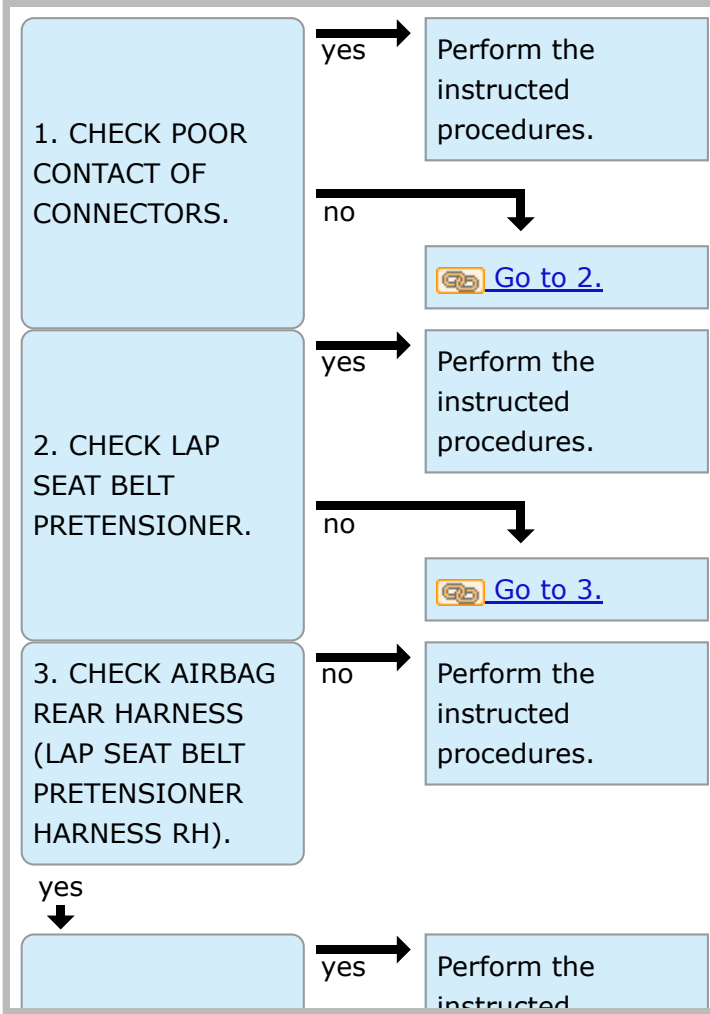
Caution:

Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

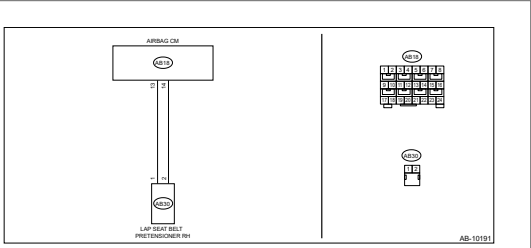
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC B19F2 SHORT IN FRONT P/T 2 RH (TO GROUND)

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



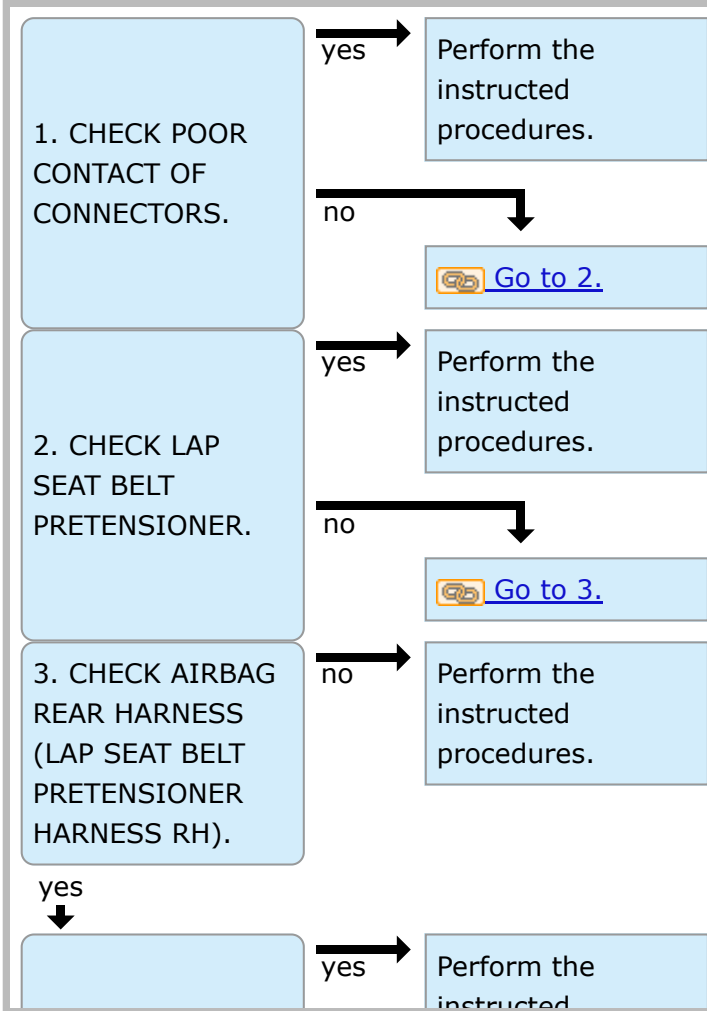
Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

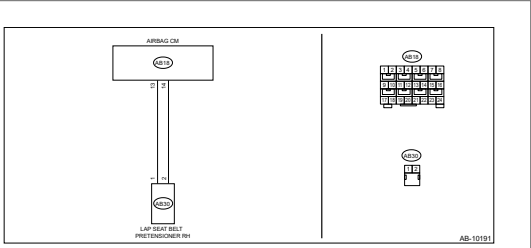
START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC B19F3 SHORT IN FRONT P/T 2 RH (TO +B)

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

START

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF


DIAGNOSIS START CONDITION:

Ignition voltage remains at 10 V or more for 1 second.

DTC DETECTING CONDITION:

Detected when malfunction occurs in CAN line.

Note:


Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

AIRBAG(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Airbag], and then select [Enter].
5. On [Select Function] display, select [DTC].

Note:

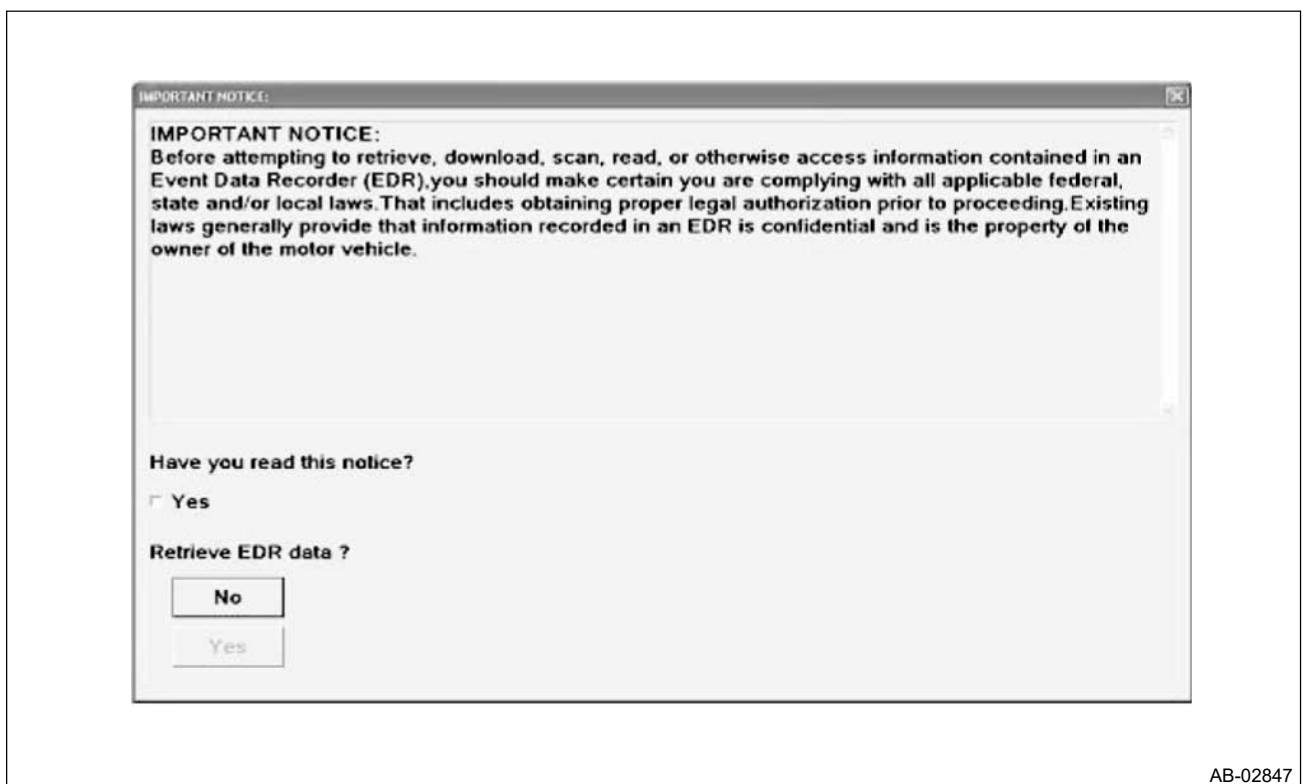
- For detailed operation procedures, refer to "Application help".
- For details concerning DTC, refer to the List of Diagnostic Trouble Codes (DTC).
 [Ref. to AIRBAG\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

Connector No.	(AB24)	(AB26)	(AB28)	(AB30)	(AB31)	(AB32)	(AB33)	(AB34)	(AB37)	(AB38)	(AB41)	(AB53)
Pin	4	2	4	2	2	4	2	4	2	2	2	3
Color	Yellow	Black	Yellow	Orange	Black	Yellow	Black	Yellow	Orange	Black	Yellow	Dark gray
Male/Female	Female	Female	Female	Female	Female	Female	Female	Female	Female	Female	Female	Male
Connector No.	(AB58)	(AB59)	(AB60)	(AB61)	(AB62)	(AB63)	(AB64)	(AB66)				
Pin	2	3	2	6	2	2	2	2				
Color	Yellow	Dark gray	Yellow	Black	Yellow	Yellow	Yellow	Black				
Male/Female	Female	Female	Male	Female	Female	Female	Female	Female				

AIRBAG(DIAGNOSTICS) > Event Record Data

OPERATION


1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Airbag], and then select [Enter].
5. On [Select Function] display, select [Work Support].
6. On [Work Support] display, select [Event Record Data].
7. On [Airbag System] display, select the event record data screen. After selection is complete, [Confirmation of Important Items] display appears.
8. After checking the content of [Confirmation of Important Items], click the check box for "Yes".
9. If the applicable law is not violated, click the [Yes] button to display the EDR data.



10. Select the items to be checked from each event record data.
11. Select the record data to be checked from each record data.
12. The selected record data is displayed. When no EDR data is recorded, [Event Record Data is not recorded] will be displayed.
13. Select [Exit] to return to each event record data screen.



AIRBAG(DIAGNOSTICS) > General Description

CAUTION

Refer to "CAUTION" in "General Description" in Airbag System.  [Ref. to AIRBAG SYSTEM>General Description>CAUTION.](#)

AIRBAG(DIAGNOSTICS) > General Description

INSPECTION

Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)  [Ref. to STARTING/CHARGING SYSTEMS\(H4DOTC\)>General Description.](#)

AIRBAG(DIAGNOSTICS) > General Description


PREPARATION TOOL

Caution:

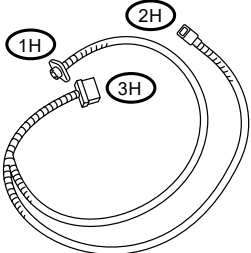
To measure the voltage and resistance of airbag system component, be sure to use the specified test harness.

1. SPECIAL TOOL

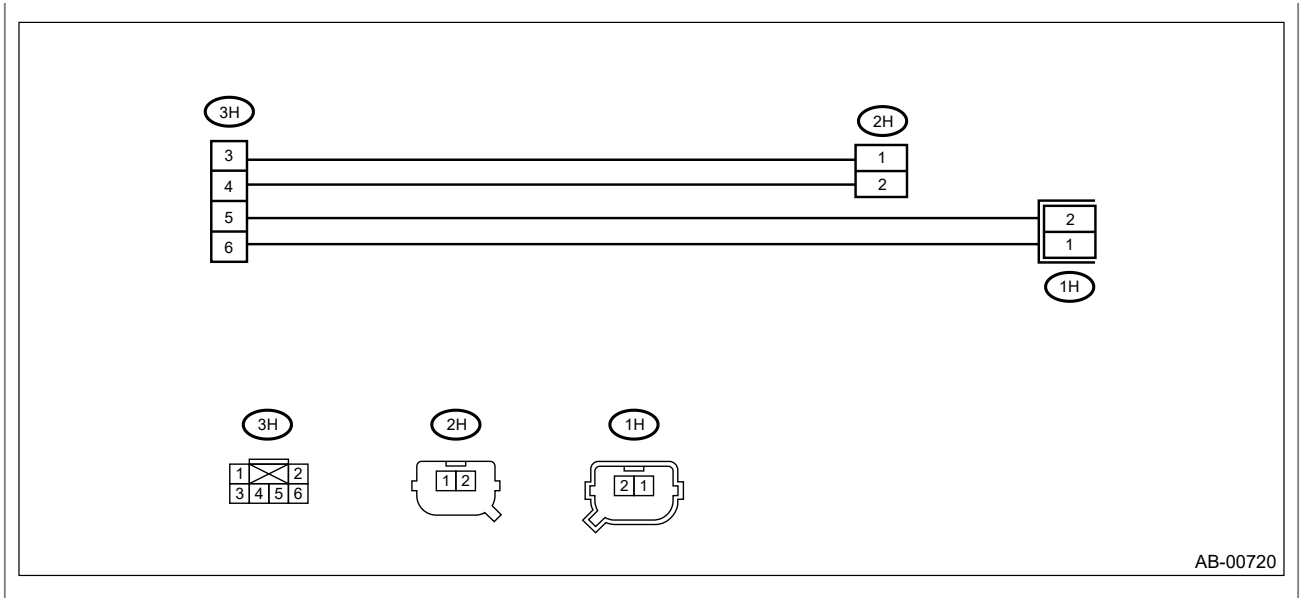
- Subaru Select Monitor

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>STSSM4</p>	<p>— (Newly adopted tool)</p>	<p>SUBARU SELECT MONITOR 4</p>	<p>Used for setting of each function and troubleshooting for electrical system.</p> <p>Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".</p>

- TEST HARNESS H

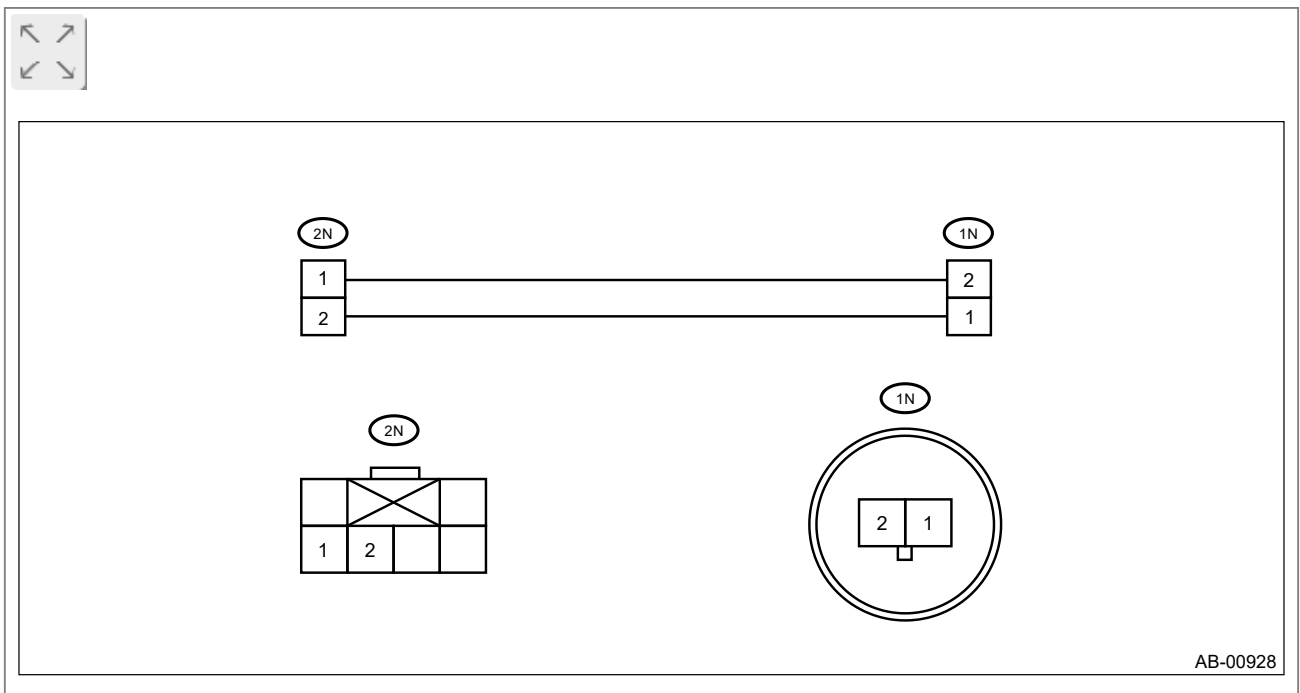
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST98299FA030</p>	<p>98299FA030</p>	<p>TEST HARNESS H</p>	<p>Used when measuring voltage and resistance of front sub sensor and front door impact sensor.</p>






• TEST HARNESS N

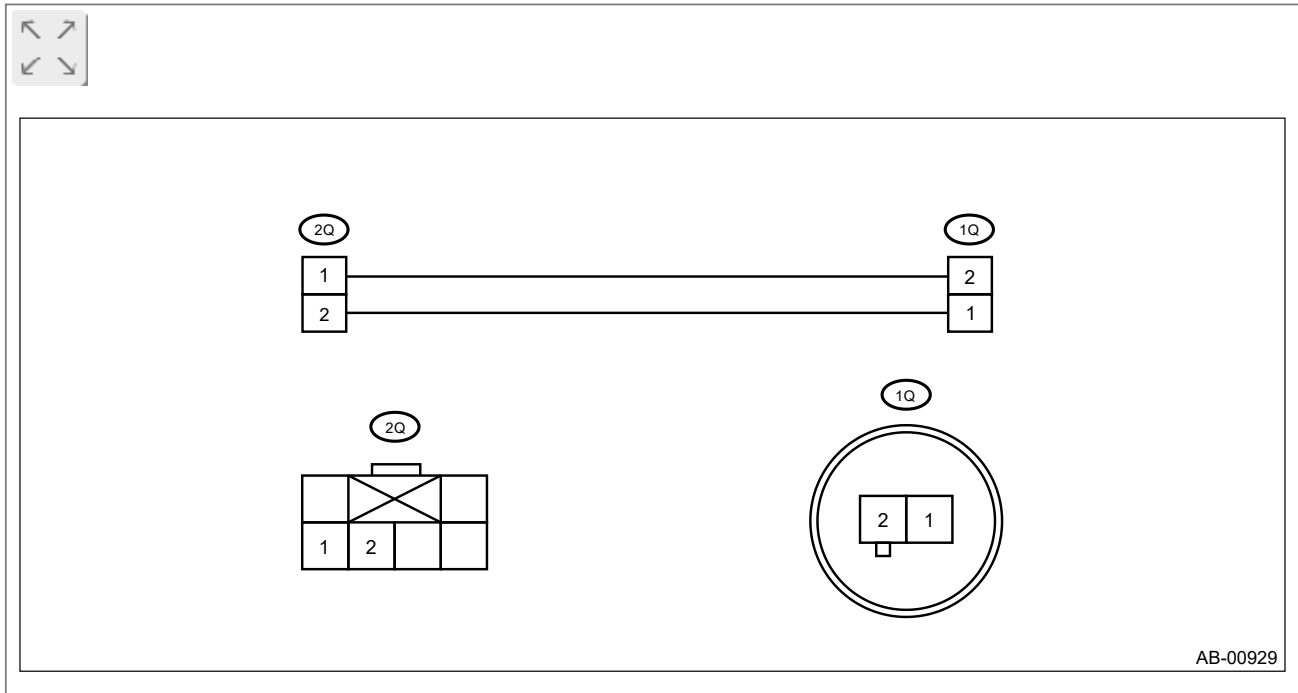
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
<p style="text-align: center;">ST98299SA000</p>	98299SA000	TEST HARNESS N	Used when measuring voltage and resistance of driver's airbag module, driver's knee airbag module, seat belt pretensioner and curtain airbag module.



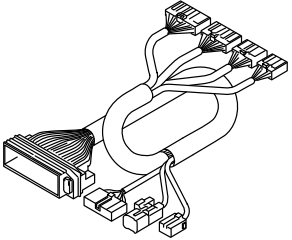
• TEST HARNESS Q

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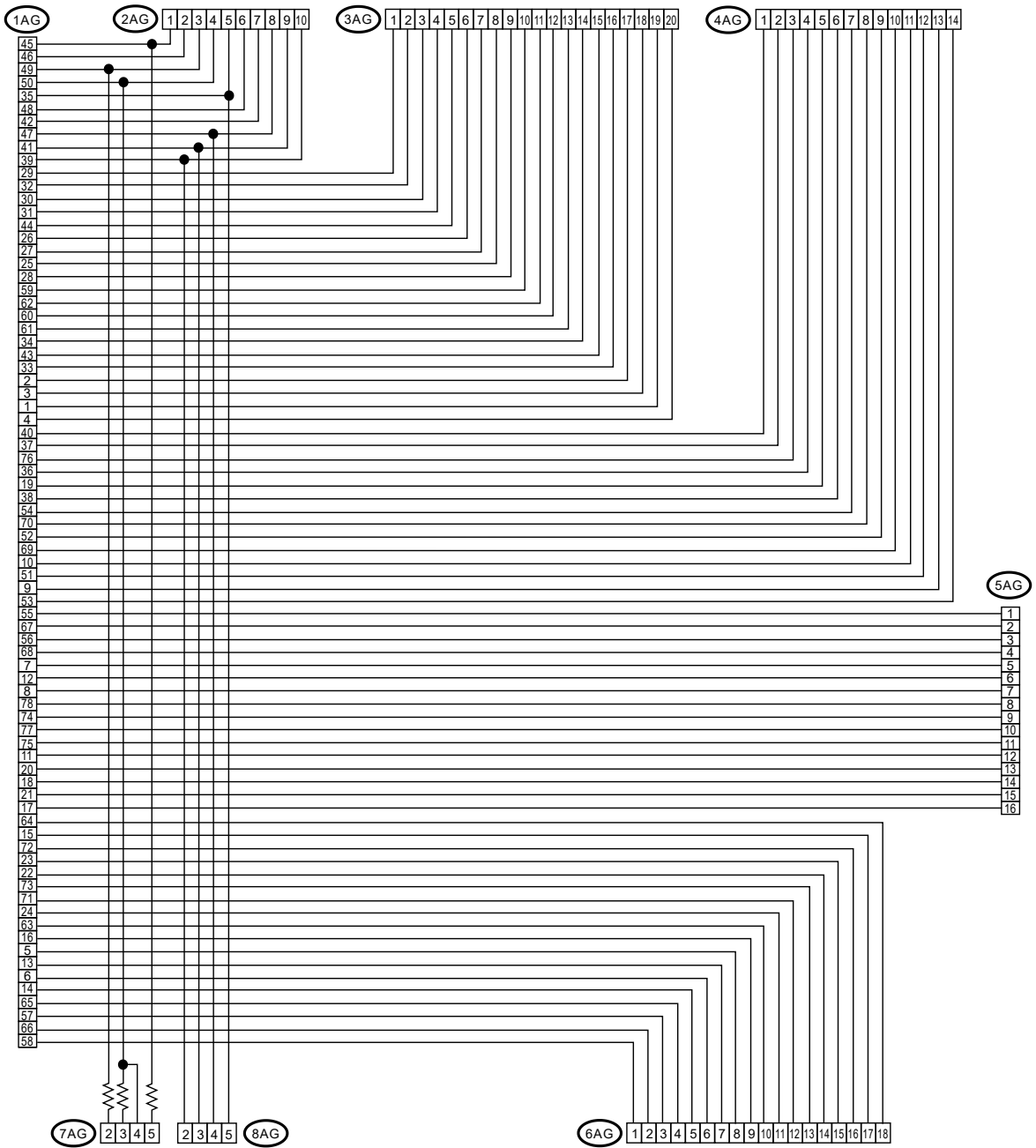
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>代替画像1 この画像は代替画像です</p>	98299SA040	TEST HARNESS Q	Used when measuring voltage and resistance of driver's airbag module.



• TEST HARNESS AG

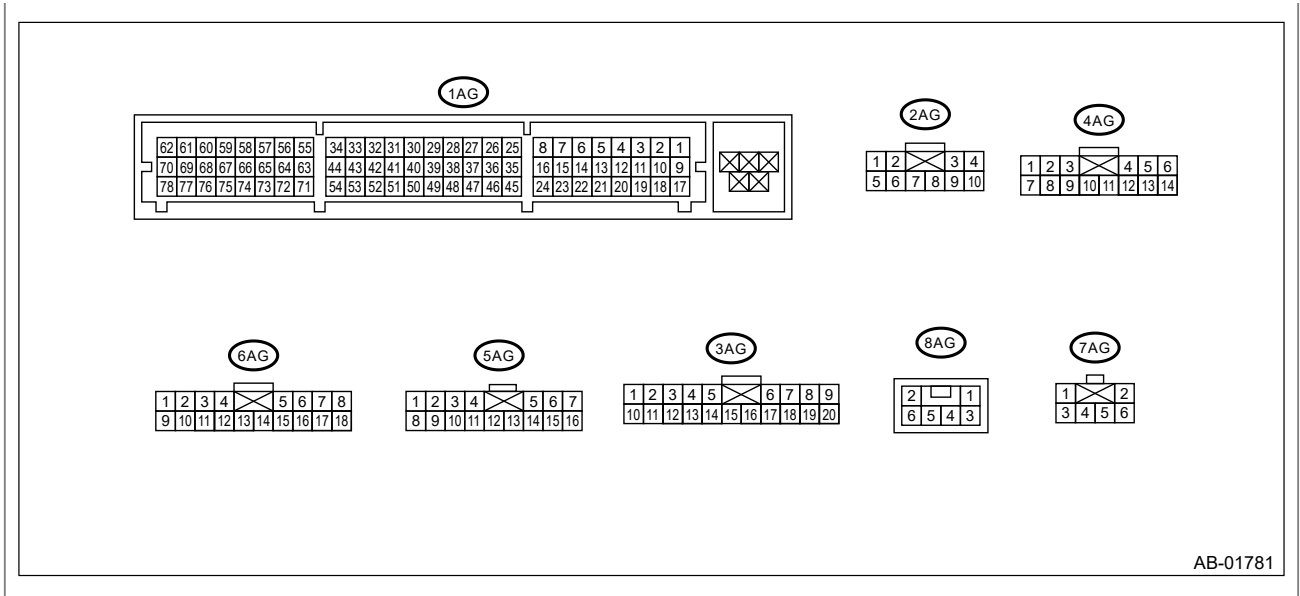
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST98299AG070</p>	98299AG070	TEST HARNESS AG	Used when measuring voltage and resistance of airbag control module.





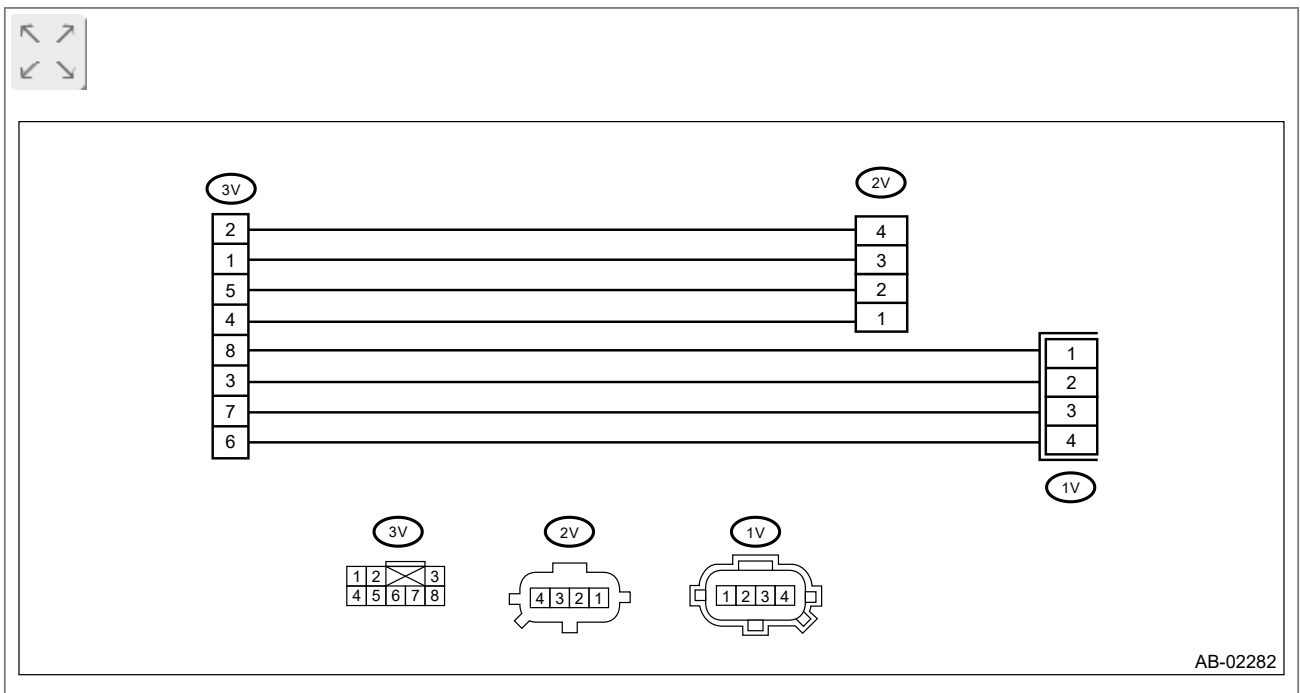
AB-01902





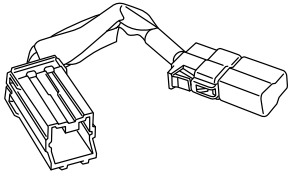
• TEST HARNESS V

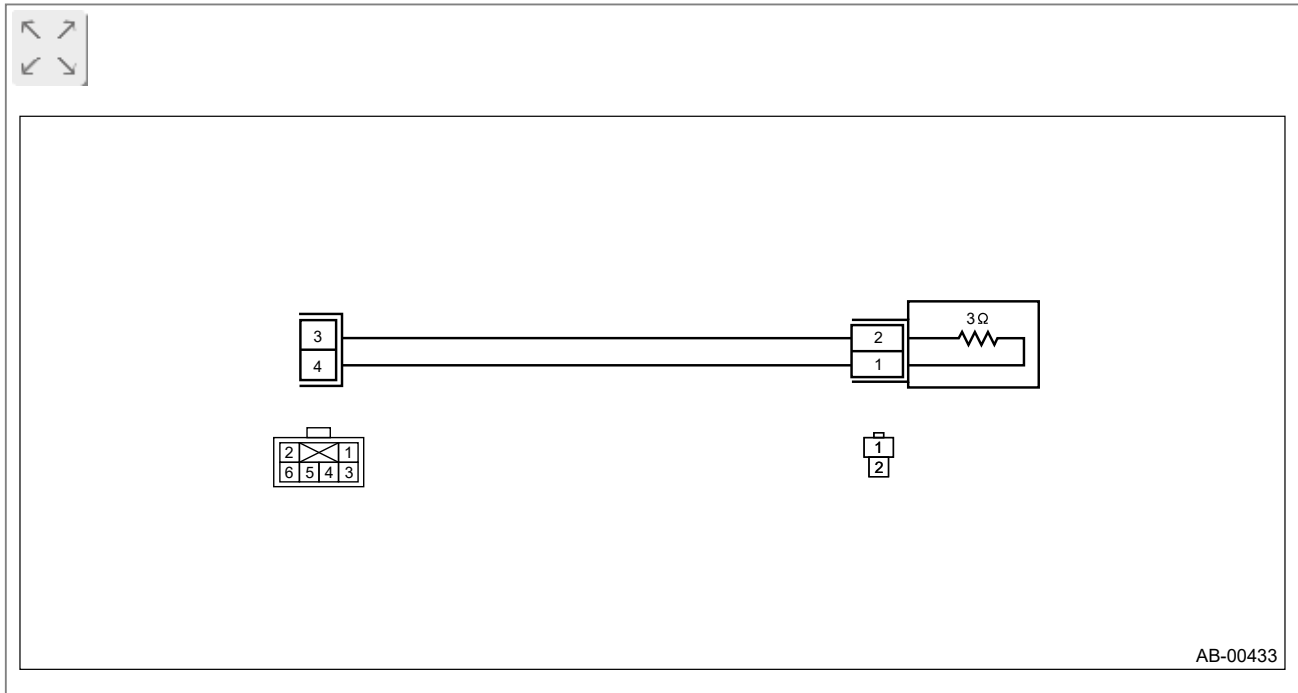
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
<p>ST98299AG010</p>	98299AG010	TEST HARNESS V	Used when measuring voltage and resistance of side airbag sensor and curtain airbag sensor.



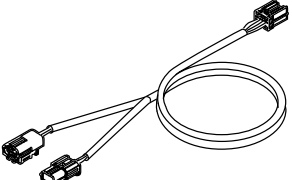
• AIRBAG RESISTOR

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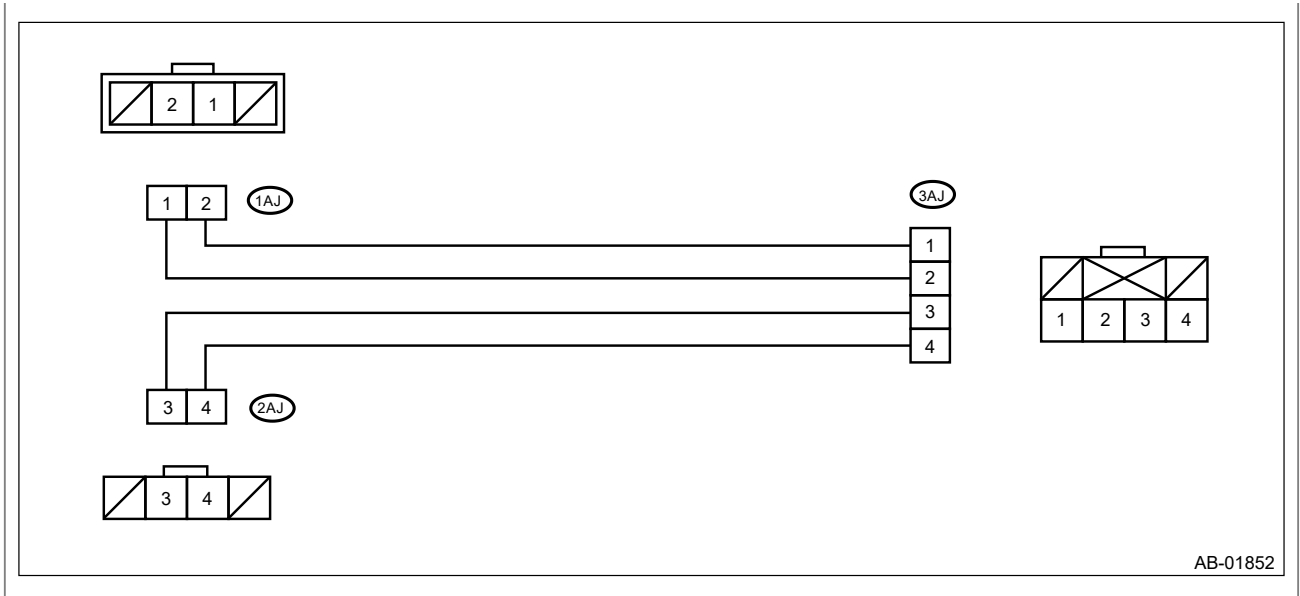
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST98299PA040</p>	98299PA040	AIRBAG RESISTOR	<p>Used in replacement of airbag module for which resistance value is same as airbag module.</p> <p>Two STs are required for diagnosis of two-stage inflator type airbag module.</p>



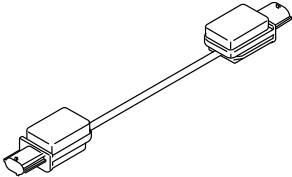
• TEST HARNESS AJ

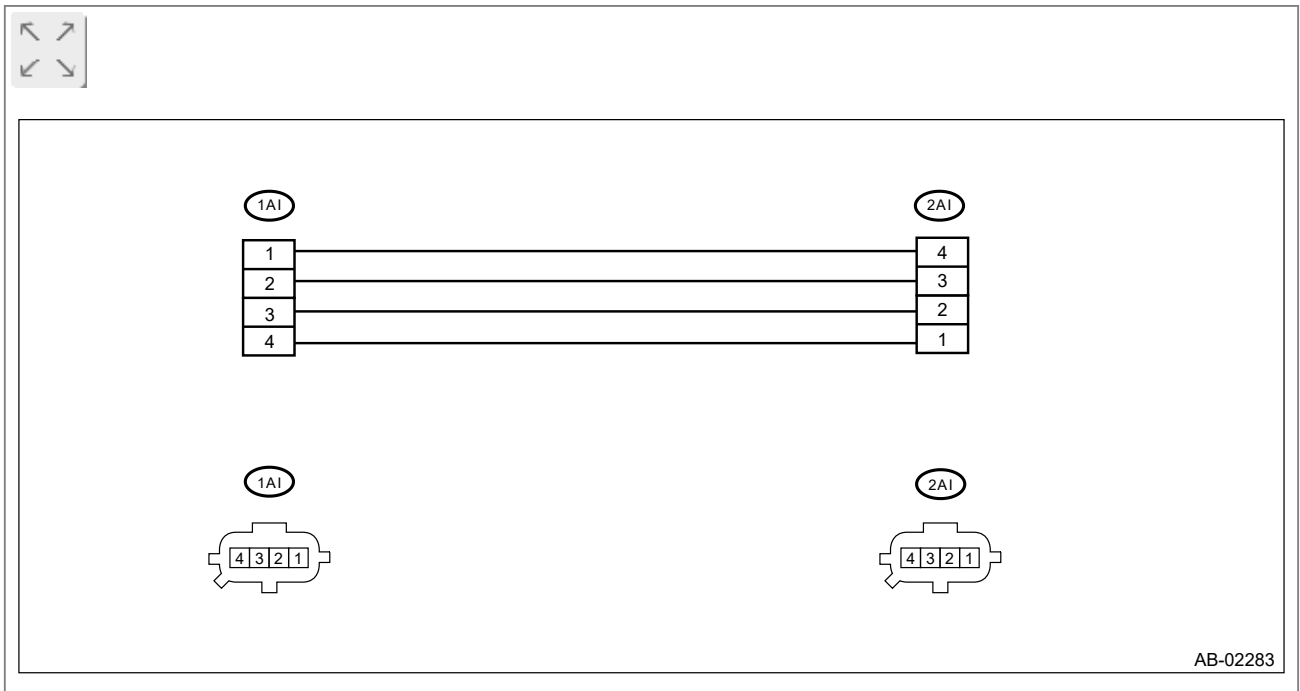
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST98299FG000</p>	98299FG000	TEST HARNESS AJ	Used when measuring power supply and resistance of side airbag harness.





• TEST HARNESS AI

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST98299AG090</p>	98299AG090	TEST HARNESS AI	<ul style="list-style-type: none"> • Used for diagnoses of side airbag sensor and curtain airbag sensor. • Used together with test harness V.

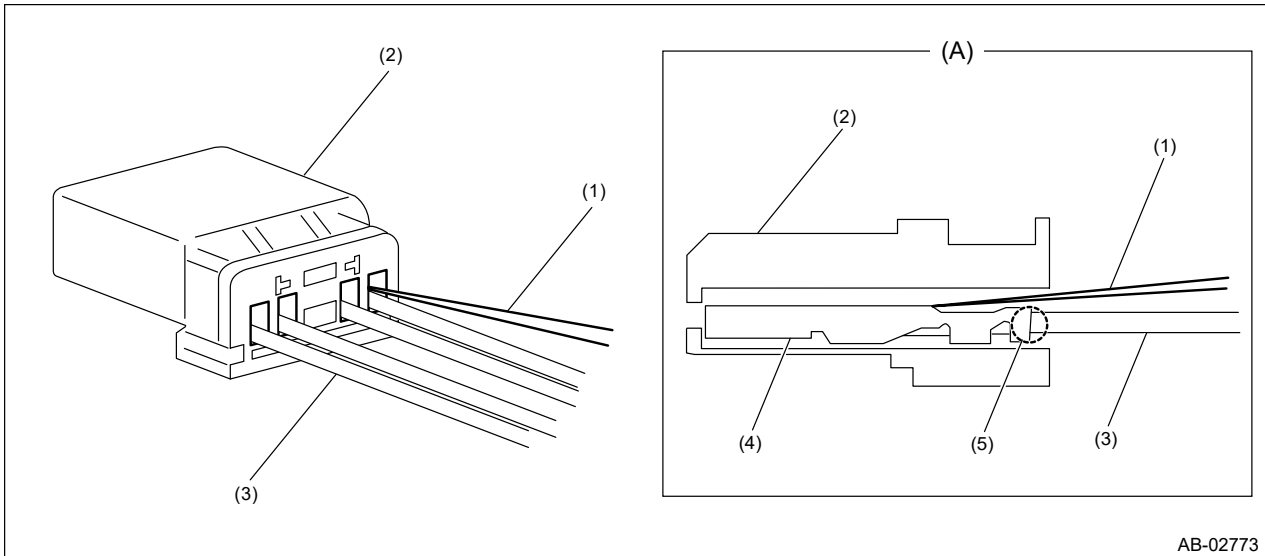


2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Probe	Used when measuring voltage and resistance of passenger's airbag module.
DST-i	Used together with Subaru Select Monitor 4.

3. HOW TO USE PROBE

Insert the probe into the harness hole, and contact it with the terminal.



AB-02773

(A) Cross section

(1) Probe

(3) Harness

(5) Connection

(2) Connector (housing)

(4) Terminal

Caution:

- Do not insert the probe forcibly.
- Be careful not to contact it to the connection (5) between the terminal and harness. (Harness will come off easily from connector if doing so.)






AIRBAG(DIAGNOSTICS) > Inspection Mode





PROCEDURE






Recreate the circumstance by referring to the conditions described in the checklist.





AIRBAG(DIAGNOSTICS) > List of Diagnostic Trouble Code (DTC)






LIST






DTC	Item	Content of diagnosis	Reference
U0073	CAN FAILURE, BUS 'OFF' DETECTION	CAN communication error occurred.	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
B1000	AIRBAG ECU MALFUNCTION	Airbag control module is faulty.	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.
B1003	AIRBAG ECU MALFUNCTION	Airbag control module is faulty.	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1003 AIRBAG ECU MALFUNCTION.
B1105	AIRBAG ECU MALFUNCTION	Airbag control module is faulty.	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1105 AIRBAG ECU MALFUNCTION.
B1106	AIRBAG ECU MALFUNCTION	Airbag control module is faulty.	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC





			B1106 AIRBAG ECU MALFUNCTION.
B1115	AIRBAG ECU MALFUNCTION	Airbag control module is faulty.	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1115 AIRBAG ECU MALFUNCTION.
B1116	AIRBAG ECU MALFUNCTION	Airbag control module is faulty.	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1116 AIRBAG ECU MALFUNCTION.
B1120	AIRBAG ECU MALFUNCTION	Airbag control module is faulty.	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1120 AIRBAG ECU MALFUNCTION.
B1121	AIRBAG ECU MALFUNCTION	Airbag control module is faulty.	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1121 AIRBAG ECU MALFUNCTION.
B1125	AIRBAG ECU MALFUNCTION	Airbag control module is faulty.	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1125 AIRBAG ECU MALFUNCTION.
B1126	AIRBAG ECU MALFUNCTION	Airbag control module is faulty.	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic






			Procedure with Diagnostic Trouble Code (DTC)>DTC B1126 AIRBAG ECU MALFUNCTION.
B1145	AIRBAG ECU MALFUNCTION	Airbag control module is faulty.	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1145 AIRBAG ECU MALFUNCTION.
B1146	AIRBAG ECU MALFUNCTION	Airbag control module is faulty.	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1146 AIRBAG ECU MALFUNCTION.
B1170	AIRBAG ECU MALFUNCTION	Airbag control module is faulty.	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1170 AIRBAG ECU MALFUNCTION.
B1185	AIRBAG ECU MALFUNCTION	Airbag control module is faulty.	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1185 AIRBAG ECU MALFUNCTION.
B1195	AIRBAG ECU MALFUNCTION	Airbag control module is faulty.	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1195 AIRBAG ECU MALFUNCTION.






B1196	AIRBAG ECU MALFUNCTION	Airbag control module is faulty.	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1196 AIRBAG ECU MALFUNCTION.
B1199	AIRBAG ECU MALFUNCTION	Airbag control module is faulty.	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1199 AIRBAG ECU MALFUNCTION.
B11E0	ROLLOVER DEPLOYMENT HISTORY	Curtain airbag module (LH/RH) and seat belt pretensioner (LH/RH) are deployed.	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11E0 ROLLOVER DEPLOYMENT HISTORY.
B11F2	FRONT IMPACT DEPLOYMENT	Front airbag module and seat belt pretensioner (LH/RH) are inflated.	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F2 FRONT IMPACT DEPLOYMENT.
B11F3	FRONT IMPACT DEPLOYMENT	Front airbag module and seat belt pretensioner (LH/RH) are inflated.	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F3 FRONT IMPACT DEPLOYMENT.
B11F4	FRONT IMPACT DEPLOYMENT	Front airbag module and seat belt pretensioner (LH/RH) are inflated.	 Ref. to AIRBAG(DIAGNOST





			ICS > Diagnostic Procedure with Diagnostic Trouble Code (DTC) > DTC B11F4 FRONT IMPACT DEPLOYMENT.
B11F5	FRONT IMPACT DEPLOYMENT	Front airbag module and seat belt pretensioner (LH/RH) are inflated.	 Ref. to AIRBAG(DIAGNOST ICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC) > DTC B11F5 FRONT IMPACT DEPLOYMENT.
B11F7	SIDE IMPACT DEPLOYMENT	<ul style="list-style-type: none"> • Side airbag module and curtain airbag module are deployed. • Curtain airbag module is deployed. 	 Ref. to AIRBAG(DIAGNOST ICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC) > DTC B11F7 SIDE IMPACT DEPLOYMENT.
B11F8	B11F8SIDE IMPACT DEPLOYMENT	<ul style="list-style-type: none"> • Side airbag module and curtain airbag module are deployed. • Curtain airbag module is deployed. 	 Ref. to AIRBAG(DIAGNOST ICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC) > DTC B11F8 SIDE IMPACT DEPLOYMENT.
B11F9	SIDE IMPACT DEPLOYMENT	<ul style="list-style-type: none"> • Side airbag module and curtain airbag module are deployed. • Curtain airbag module is deployed. 	 Ref. to AIRBAG(DIAGNOST ICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC) > DTC B11F9 SIDE IMPACT DEPLOYMENT.
B11FA	SIDE IMPACT DEPLOYMENT	<ul style="list-style-type: none"> • Side airbag module and curtain airbag module are deployed. 	 Ref. to AIRBAG(DIAGNOST






		<ul style="list-style-type: none"> • Curtain airbag module is deployed. 	ICS > Diagnostic Procedure with Diagnostic Trouble Code (DTC) > DTC B11FA SIDE IMPACT DEPLOYMENT.
B11FB	SIDE IMPACT DEPLOYMENT	<ul style="list-style-type: none"> • Side airbag module and curtain airbag module are deployed. • Curtain airbag module is deployed. 	 Ref. to AIRBAG(DIAGNOST ICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC) > DTC B11FB SIDE IMPACT DEPLOYMENT.
B11FC	SIDE IMPACT DEPLOYMENT	<ul style="list-style-type: none"> • Side airbag module and curtain airbag module are deployed. • Curtain airbag module is deployed. 	 Ref. to AIRBAG(DIAGNOST ICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC) > DTC B11FC SIDE IMPACT DEPLOYMENT.
B1610	FRONT SUB SENSOR RH FAILURE	Front sub sensor RH is faulty.	 Ref. to AIRBAG(DIAGNOST ICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC) > DTC B1610 FRONT SUB SENSOR RH FAILURE.
B1612	FRONT SUB SENSOR RH LOST COMMUNICATION	<ul style="list-style-type: none"> • Open or short circuit in harness RH between airbag control module and front sub sensor. • Front sub sensor RH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC) > DTC B1612 FRONT SUB SENSOR RH LOST COMMUNICATION.
B1613	FRONT SUB SENSOR RH INITIALIZATION ERROR		 Ref. to AIRBAG(DIAGNOST





			ICS)> Diagnostic Procedure with Diagnostic Trouble Code (DTC) > DTC B1613 FRONT SUB SENSOR RH INITIALIZATION ERROR.
B1615	FRONT SUB SENSOR LH FAILURE	Front sub sensor LH is faulty.	 Ref. to AIRBAG(DIAGNOST ICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC) > DTC B1615 FRONT SUB SENSOR LH FAILURE.
B1617	FRONT SUB SENSOR LH LOST COMMUNICATION	<ul style="list-style-type: none"> • Open or short circuit in harness LH between airbag control module and front sub sensor. • Front sub sensor LH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC) > DTC B1617 FRONT SUB SENSOR LH LOST COMMUNICATION.
B1618	FRONT SUB SENSOR LH INITIALIZATION ERROR		 Ref. to AIRBAG(DIAGNOST ICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC) > DTC B1618 FRONT SUB SENSOR LH INITIALIZATION ERROR.
B16F2	FRONT SUB SENSOR RH RECOGNITION ERROR	<ul style="list-style-type: none"> • Front sensor RH is misinstalled. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC) > DTC B16F2 FRONT SUB SENSOR RH






			RECOGNITION ERROR.
B16F3	FRONT SUB SENSOR LH RECOGNITION ERROR	<ul style="list-style-type: none"> • Front sensor LH is misinstalled. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16F3 FRONT SUB SENSOR LH RECOGNITION ERROR.
B1620	SIDE AIRBAG SENSOR RH FAILURE	Side airbag sensor RH is faulty.	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1620 SIDE AIRBAG SENSOR RH FAILURE.
B1622	SIDE AIRBAG SENSOR RH LOST COMMUNICATION	Side airbag sensor RH is faulty.	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1622 SIDE AIRBAG SENSOR RH LOST COMMUNICATION.
B1623	SIDE AIRBAG SENSOR RH INITIALIZATION ERROR	<ul style="list-style-type: none"> • Side airbag sensor RH is faulty. • Open circuit in harness between airbag control module and side airbag sensor RH. • Shorted to power supply in High side circuit of the side satellite sensor bus RH. • Shorted to ground in Low side circuit of the side satellite sensor bus RH. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1623 SIDE AIRBAG SENSOR RH INITIALIZATION ERROR.
B1625	SIDE AIRBAG SENSOR LH FAILURE	Side airbag sensor LH is faulty.	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with





			Diagnostic Trouble Code (DTC)>DTC B1625 SIDE AIRBAG SENSOR LH FAILURE.
B1627	SIDE AIRBAG SENSOR LH LOST COMMUNICATION	Side airbag sensor LH is faulty.	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1627 SIDE AIRBAG SENSOR LH LOST COMMUNICATION.
B1628	SIDE AIRBAG SENSOR LH INITIALIZATION ERROR	<ul style="list-style-type: none"> • Side airbag sensor LH is faulty. • Open circuit in harness between airbag control module and side airbag sensor LH. • Shorted to power supply in High side circuit of the side satellite sensor bus LH. • Shorted to ground in Low side circuit of the side satellite sensor bus LH. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1628 SIDE AIRBAG SENSOR LH INITIALIZATION ERROR.
B1630	CURTAIN AIRBAG SENSOR RH FAILURE	Curtain airbag sensor RH is faulty.	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1630 CURTAIN AIRBAG SENSOR RH FAILURE.
B1632	CURTAIN AIRBAG SENSOR RH LOST COMMUNICATION	Curtain airbag sensor RH is faulty.	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1632 CURTAIN AIRBAG SENSOR RH LOST COMMUNICATION.
B1633	CURTAIN AIRBAG SENSOR	<ul style="list-style-type: none"> • Curtain airbag sensor RH is faulty. 	 Ref. to


	RH INITIALIZATION ERROR	<ul style="list-style-type: none"> Open circuit in harness between side airbag sensor RH and curtain airbag sensor RH. 	AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1633 CURTAIN AIRBAG SENSOR RH INITIALIZATION ERROR.
B1635	CURTAIN AIRBAG SENSOR LH FAILURE	Curtain airbag sensor LH is faulty.	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1635 CURTAIN AIRBAG SENSOR LH FAILURE.
B1637	CURTAIN AIRBAG SENSOR LH LOST COMMUNICATION	Curtain airbag sensor LH is faulty.	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1637 CURTAIN AIRBAG SENSOR LH LOST COMMUNICATION.
B1638	CURTAIN AIRBAG SENSOR LH INITIALIZATION ERROR	<ul style="list-style-type: none"> Curtain airbag sensor LH is faulty. Open circuit in harness between side airbag sensor LH and curtain airbag sensor LH. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1638 CURTAIN AIRBAG SENSOR LH INITIALIZATION ERROR.
B16F4	SIDE AIRBAG SENSOR RH RECOGNITION ERROR	<ul style="list-style-type: none"> Side airbag sensor RH is misinstalled. Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16F4 SIDE





			AIRBAG SENSOR RH RECOGNITION ERROR.
B16F5	SIDE AIRBAG SENSOR LH RECOGNITION ERROR	<ul style="list-style-type: none"> • Side airbag sensor LH is misinstalled. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16F5 SIDE AIRBAG SENSOR LH RECOGNITION ERROR.
B16F6	CURTAIN AIRBAG SENSOR RH RECOGNITION ERROR	<ul style="list-style-type: none"> • Curtain airbag sensor RH is misinstalled. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16F6 CURTAIN AIRBAG SENSOR RH RECOGNITION ERROR.
B16F7	CURTAIN AIRBAG SENSOR LH RECOGNITION ERROR	<ul style="list-style-type: none"> • Curtain airbag sensor LH is misinstalled. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16F7 CURTAIN AIRBAG SENSOR LH RECOGNITION ERROR.
B1642	SIDE SATELLITE SENSOR BUS RH LOST COMMUNICATION	<ul style="list-style-type: none"> • Open circuit in harness between airbag control module and side airbag sensor RH, and between side airbag sensor RH and curtain airbag sensor RH. • Satellite sensor bus RH circuit shorted, shorted to ground or shorted to power supply. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1642 SIDE SATELLITE SENSOR BUS RH LOST COMMUNICATION.
B1643	SIDE SATELLITE SENSOR BUS RH INITIALIZATION	Side satellite sensor bus RH circuit shorted, shorted to ground or shorted to	 Ref. to AIRBAG(DIAGNOSTICS)






	ERROR	power supply.	ICS > Diagnostic Procedure with Diagnostic Trouble Code (DTC) > DTC B1643 SIDE SATELLITE SENSOR BUS RH INITIALIZATION ERROR.
B1647	SIDE SATELLITE SENSOR BUS LH LOST COMMUNICATION	<ul style="list-style-type: none"> • Open circuit in harness between airbag control module and side airbag sensor LH, and between side airbag sensor LH and curtain airbag sensor LH. • Satellite sensor bus LH circuit shorted, shorted to ground or shorted to power supply. 	 Ref. to AIRBAG(DIAGNOST ICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC) > DTC B1647 SIDE SATELLITE SENSOR BUS LH LOST COMMUNICATION.
B1648	SIDE SATELLITE SENSOR BUS LH INITIALIZATION ERROR	Side satellite sensor bus LH circuit shorted, shorted to ground or shorted to power supply.	 Ref. to AIRBAG(DIAGNOST ICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC) > DTC B1648 SIDE SATELLITE SENSOR BUS LH INITIALIZATION ERROR.
B1650	OCCUPANT DETECTION SYSTEM MALFUNCTION	<ul style="list-style-type: none"> • Occupant detection sensor is faulty. • Occupant detection control module is faulty. • Occupant detection harness is faulty. • Rear airbag harness RH is faulty. • Fuse No. 25 is blown. 	 Ref. to AIRBAG(DIAGNOST ICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC) > DTC B1650 OCCUPANT DETECTION SYSTEM MALFUNCTION.
B1655	FRONT BUCKLE SWITCH RH FAILURE	<ul style="list-style-type: none"> • Buckle switch RH circuit is open, shorted or shorted to ground. • Occupant detection system is faulty. • Occupant detection harness is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS) > Diagnostic Procedure with Diagnostic Trouble






			Code (DTC)>DTC B1655 FRONT BUCKLE SWITCH RH FAILURE.
B1660	PASSENGER'S AIRBAG ON INDICATOR FAILURE	<ul style="list-style-type: none"> • Passenger's airbag indicator is faulty. • Airbag control module is faulty. • Airbag main harness circuit is open, shorted or shorted to ground. • Body harness circuit is open. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1660 PASSENGER'S AIRBAG ON INDICATOR FAILURE.
B1675	SATELLITE SAFING SENSOR FAILURE	Satellite safing sensor is faulty.	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1675 SATELLITE SAFING SENSOR FAILURE.
B1676	LOST COMMUNICATION WITH SATELLITE SAFING SENSOR	<ul style="list-style-type: none"> • Open or short circuit in harness between airbag control module and satellite safing sensor. • Satellite safing sensor is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1676 LOST COMMUNICATION WITH SATELLITE SAFING SENSOR.
B1677	SATELLITE SAFING SENSOR INITIALIZATION INCOMPLETE		 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1677 SATELLITE SAFING SENSOR INITIALIZATION INCOMPLETE.
B16F8	SATELLITE SAFING SENSOR	<ul style="list-style-type: none"> • Satellite safing sensor is misinstalled. 	 Ref. to





	RECOGNITION ERROR	<ul style="list-style-type: none"> Airbag control module is faulty. 	AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16F8 SATELLITE SAFING SENSOR RECOGNITION ERROR.
B16F9	DOOR SENSOR RH RECOGNITION ERROR	<ul style="list-style-type: none"> Front door impact sensor RH is misinstalled. Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16F9 DOOR SENSOR RH RECOGNITION ERROR.
B1690	DOOR SENSOR RH FAILURE	Front door impact sensor RH is faulty.	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1690 DOOR SENSOR RH FAILURE.
B1692	LOST COMMUNICATION WITH DOOR SENSOR RH	<ul style="list-style-type: none"> Front door impact sensor RH is faulty. Open circuit in harness between curtain airbag sensor RH and front door impact sensor RH. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1692 LOST COMMUNICATION WITH DOOR SENSOR RH.
B1693	DOOR SENSOR RH INITIALIZATION INCOMPLETE		 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1693 DOOR






			SENSOR RH INITIALIZATION INCOMPLETE.
B16FA	DOOR SENSOR LH RECOGNITION ERROR	<ul style="list-style-type: none"> • Front door impact sensor LH is misinstalled. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16FA DOOR SENSOR LH RECOGNITION ERROR.
B1695	DOOR SENSOR LH FAILURE	Front door impact sensor LH is faulty.	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1695 DOOR SENSOR LH FAILURE.
B1697	LOST COMMUNICATION WITH DOOR SENSOR LH	<ul style="list-style-type: none"> • Front door impact sensor LH is faulty. • Open circuit in harness between curtain airbag sensor LH and front door impact sensor LH. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1697 LOST COMMUNICATION WITH DOOR SENSOR LH.
B1698	DOOR SENSOR LH INITIALIZATION INCOMPLETE		 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1698 DOOR SENSOR LH INITIALIZATION INCOMPLETE.
B161A	LOST COMMUNICATION WITH FRONT SATELLITE SENSOR BUS	<ul style="list-style-type: none"> • Open or short circuit in harness between airbag control module and front sub sensor. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic






		<ul style="list-style-type: none"> • Front sub sensor is faulty. • Airbag control module is faulty. 	Procedure with Diagnostic Trouble Code (DTC)>DTC B161A LOST COMMUNICATION WITH FRONT SATELLITE SENSOR BUS.
B16F1	PASSENGER'S SEAT BELT WARNING FAILURE	<ul style="list-style-type: none"> • Airbag control module is faulty. • Meter is faulty. • Harness circuits between meter and airbag control module are open, shorted or shorted to ground. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16F1 PASSENGER'S SEAT BELT WARNING FAILURE.
B16F0	PASSENGER'S AIRBAG OFF INDICATOR FAILURE	<ul style="list-style-type: none"> • Passenger's airbag indicator is faulty. • Airbag control module is faulty. • Airbag main harness circuit is open or shorted. • Body harness circuit is open. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16F0 PASSENGER'S AIRBAG OFF INDICATOR FAILURE.
B1760	OCCUPANT DETECTION SENSOR MAT	<ul style="list-style-type: none"> • Occupant detection sensor circuit is open, shorted between terminals, shorted to power supply or shorted to ground. • Seat heater circuit is open. • Occupant detection control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1760 OCCUPANT DETECTION SENSOR MAT.
B1771	BUCKLE SWITCH	<ul style="list-style-type: none"> • Passenger's buckle switch circuit is open, shorted or shorted to ground. • Occupant detection system is faulty. • Occupant detection harness is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC






			B1771 BUCKLE SWITCH.
B1795	OCCUPANT DETECTION MODULE INTERNAL CIRCUIT	Occupant detection control module is faulty.	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1795 OCCUPANT DETECTION MODULE INTERNAL CIRCUIT.
B1800	SHORT IN DRIVER'S AIRBAG	<ul style="list-style-type: none"> • Airbag main harness circuit is shorted. • Airbag module harness (driver's side) circuit is shorted. • Roll connector circuit is shorted. • Driver's airbag module is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1800 SHORT IN DRIVER'S AIRBAG.
B1801	OPEN IN DRIVER'S AIRBAG	<ul style="list-style-type: none"> • Airbag main harness circuit is open. • Airbag module harness circuit (driver's side) is open. • Roll connector circuit is open. • Driver's airbag module is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1801 OPEN IN DRIVER'S AIRBAG.
B1802	SHORT IN DRIVER'S AIRBAG (TO GROUND)	<ul style="list-style-type: none"> • Airbag main harness circuit is shorted to ground. • Airbag module harness (driver's side) circuit is shorted to ground. • Roll connector circuit is shorted to ground. • Driver's airbag module is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1802 SHORT IN DRIVER'S AIRBAG (TO GROUND).
B1803	SHORT IN DRIVER'S AIRBAG (TO +B)	<ul style="list-style-type: none"> • Airbag main harness circuit is shorted to power supply. • Airbag module harness circuit (driver's side) is shorted to power supply. • Roll connector circuit is shorted to power supply. • Driver's airbag module is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1803 SHORT IN





			DRIVER'S AIRBAG (TO &plus;B).
B1805	SHORT IN PASSENGER'S AIRBAG	<ul style="list-style-type: none"> • Airbag main harness circuit is shorted. • Airbag module harness circuit (passenger's side) is shorted. • Passenger's airbag module is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1805 SHORT IN PASSENGER'S AIRBAG.
B1806	OPEN IN PASSENGER'S AIRBAG	<ul style="list-style-type: none"> • Airbag main harness circuit is open. • Airbag module harness circuit (passenger's side) is open. • Passenger's airbag module is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1806 OPEN IN PASSENGER'S AIRBAG.
B1807	SHORT IN PASSENGER'S AIRBAG (TO GROUND)	<ul style="list-style-type: none"> • Airbag main harness circuit is shorted to ground. • Airbag module harness (passenger's side) circuit is shorted to ground. • Passenger's airbag module is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1807 SHORT IN PASSENGER'S AIRBAG (TO GROUND).
B1808	SHORT IN PASSENGER'S AIRBAG (TO +B)	<ul style="list-style-type: none"> • Airbag main harness circuit is shorted to power supply. • Airbag module harness (passenger's side) circuit is shorted to power supply. • Passenger's airbag module is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1808 SHORT IN PASSENGER'S AIRBAG (TO &plus;B).
B1810	SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP	<ul style="list-style-type: none"> • Airbag main harness circuit is shorted. • Airbag module harness (driver's side) circuit is shorted. • Roll connector circuit is shorted. • Driver's airbag module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble






		<ul style="list-style-type: none"> • Airbag control module is faulty. 	Code (DTC)>DTC B1810 SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP.
B1811	OPEN IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP	<ul style="list-style-type: none"> • Airbag main harness circuit is open. • Airbag module harness circuit (driver's side) is open. • Roll connector circuit is open. • Driver's airbag module is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1811 OPEN IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP.
B1812	SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP (TO GROUND)	<ul style="list-style-type: none"> • Airbag main harness circuit is shorted to ground. • Airbag module harness (driver's side) circuit is shorted to ground. • Roll connector circuit is shorted to ground. • Driver's airbag module is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1812 SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP (TO GROUND).
B1813	SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP CIRCUIT (TO +B)	<ul style="list-style-type: none"> • Airbag main harness circuit is shorted to power supply. • Airbag module harness circuit (driver's side) is shorted to power supply. • Roll connector circuit is shorted to power supply. • Airbag module is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1813 SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP CIRCUIT (TO +B).
B1815	SHORT IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP	<ul style="list-style-type: none"> • Airbag main harness circuit is shorted. • Airbag module harness circuit (passenger's side) is shorted. • Passenger's airbag module is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1815 SHORT IN PASSENGER'S






			AIRBAG DUAL STAGE - 2ND STEP.
B1816	OPEN IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP	<ul style="list-style-type: none"> • Airbag main harness circuit is open. • Airbag module harness circuit (passenger's side) is open. • Passenger's airbag module is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1816 OPEN IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP.
B1817	SHORT IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP (TO GROUND)	<ul style="list-style-type: none"> • Airbag main harness circuit is shorted to ground. • Airbag module harness (passenger's side) circuit is shorted to ground. • Passenger's airbag module is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1817 SHORT IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP (TO GROUND).
B1818	SHORT IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP CIRCUIT (TO +B)	<ul style="list-style-type: none"> • Airbag main harness circuit is shorted to power supply. • Airbag module harness (passenger's side) circuit is shorted to power supply. • Passenger's airbag module is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1818 SHORT IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP CIRCUIT (TO +B).
B1820	SHORT IN SIDE AIRBAG RH	<ul style="list-style-type: none"> • Side airbag harness RH circuit is shorted. • Side airbag module RH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1820 SHORT IN SIDE AIRBAG RH.
B1821	OPEN IN SIDE AIRBAG RH	<ul style="list-style-type: none"> • Side airbag harness RH circuit is open. • Side airbag module RH is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)






		<ul style="list-style-type: none"> • Airbag control module is faulty. 	ICS>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1821 OPEN IN SIDE AIRBAG RH.
B1822	SHORT IN SIDE AIRBAG RH (TO GROUND)	<ul style="list-style-type: none"> • Side airbag harness RH circuit is shorted to ground. • Side airbag module RH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1822 SHORT IN SIDE AIRBAG RH (TO GROUND).
B1823	SHORT IN SIDE AIRBAG RH (TO +B)	<ul style="list-style-type: none"> • Side airbag harness RH circuit is shorted to power supply. • Side airbag module RH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1823 SHORT IN SIDE AIRBAG RH (TO &plus;B).
B1825	SHORT IN SIDE AIRBAG LH	<ul style="list-style-type: none"> • Side airbag harness LH circuit is shorted. • Side airbag module LH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1825 SHORT IN SIDE AIRBAG LH.
B1826	OPEN IN SIDE AIRBAG LH	<ul style="list-style-type: none"> • Side airbag harness LH circuit is open. • Side airbag module LH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1826 OPEN IN SIDE AIRBAG LH.
B1827	SHORT IN SIDE AIRBAG LH (TO GROUND)	<ul style="list-style-type: none"> • Side airbag harness LH circuit is shorted to ground. • Side airbag module LH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble


			Code (DTC)>DTC B1827 SHORT IN SIDE AIRBAG LH (TO GROUND).
B1828	SHORT IN SIDE AIRBAG LH (TO +B)	<ul style="list-style-type: none"> • Side airbag harness LH circuit is shorted to power supply. • Side airbag module LH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1828 SHORT IN SIDE AIRBAG LH (TO +B).
B1830	SHORT IN CURTAIN AIRBAG RH SQUIB CIRCUIT	<ul style="list-style-type: none"> • Curtain airbag harness RH circuit is shorted. • Curtain airbag module RH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1830 SHORT IN CURTAIN AIRBAG RH SQUIB CIRCUIT.
B1831	OPEN IN CURTAIN AIRBAG RH SQUIB CIRCUIT	<ul style="list-style-type: none"> • Curtain airbag harness RH circuit is open. • Curtain airbag module RH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1831 OPEN IN CURTAIN AIRBAG RH SQUIB CIRCUIT.
B1832	SHORT IN CURTAIN AIRBAG RH SQUIB CIRCUIT (TO GROUND)	<ul style="list-style-type: none"> • Curtain airbag harness RH circuit is shorted to ground. • Curtain airbag module RH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1832 SHORT IN CURTAIN AIRBAG RH SQUIB CIRCUIT (TO GROUND).
B1833	SHORT IN CURTAIN SHIELD AIRBAG RH SQUIB CIRCUIT	<ul style="list-style-type: none"> • Curtain airbag harness RH is shorted to power supply. 	 Ref. to AIRBAG(DIAGNOST

	(TO +B)	<ul style="list-style-type: none"> • Curtain airbag module RH is faulty. • Airbag control module is faulty. 	ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1833 SHORT IN CURTAIN SHIELD AIRBAG RH SQUIB CIRCUIT (TO &plus;B).
B1835	SHORT IN CURTAIN AIRBAG LH SQUIB CIRCUIT	<ul style="list-style-type: none"> • Curtain airbag harness LH circuit is shorted. • Curtain airbag module LH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1835 SHORT IN CURTAIN AIRBAG LH SQUIB CIRCUIT.
B1836	OPEN IN CURTAIN AIRBAG LH SQUIB CIRCUIT	<ul style="list-style-type: none"> • Curtain airbag harness LH circuit is open. • Curtain airbag module LH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1836 OPEN IN CURTAIN AIRBAG LH SQUIB CIRCUIT.
B1837	SHORT IN CURTAIN AIRBAG LH SQUIB CIRCUIT (TO GROUND)	<ul style="list-style-type: none"> • Curtain airbag harness LH circuit is shorted to ground. • Curtain airbag module LH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1837 SHORT IN CURTAIN AIRBAG LH SQUIB CIRCUIT (TO GROUND).
B1838	SHORT IN CURTAIN SHIELD AIRBAG LH SQUIB CIRCUIT (TO +B)	<ul style="list-style-type: none"> • Curtain airbag harness LH is shorted to power supply. • Curtain airbag module LH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1838 SHORT IN CURTAIN SHIELD

			AIRBAG LH SQUIB CIRCUIT (TO &plus;B).
B1860	SHORT IN DRIVER'S KNEE AIRBAG	<ul style="list-style-type: none"> • Airbag main harness circuit is shorted. • Knee airbag module harness circuit is shorted. • Knee airbag module is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1860 SHORT IN DRIVER'S KNEE AIRBAG.
B1861	OPEN IN DRIVER'S KNEE AIRBAG	<ul style="list-style-type: none"> • Airbag main harness circuit is open. • Knee airbag module harness circuit is open. • Knee airbag module is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1861 OPEN IN DRIVER'S KNEE AIRBAG.
B1862	SHORT IN DRIVER'S KNEE AIRBAG (TO GROUND)	<ul style="list-style-type: none"> • Airbag main harness circuit is shorted to ground. • Knee airbag module harness circuit is shorted to ground. • Knee airbag module is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1862 SHORT IN DRIVER'S KNEE AIRBAG (TO GROUND).
B1863	SHORT IN DRIVER'S KNEE AIRBAG (TO +B)	<ul style="list-style-type: none"> • Airbag main harness circuit is shorted to power supply. • Knee airbag module harness circuit is shorted to power supply. • Knee airbag module is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1863 SHORT IN DRIVER'S KNEE AIRBAG (TO &plus;B).
B1900	SHORT IN FRONT P/T RH	<ul style="list-style-type: none"> • Seat belt pretensioner harness RH circuit is shorted. • Pretensioner RH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with

			Diagnostic Trouble Code (DTC)>DTC B1900 SHORT IN FRONT P/T RH.
B1901	OPEN IN FRONT P/T RH	<ul style="list-style-type: none"> • Seat belt pretensioner harness RH circuit is open. • Pretensioner RH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1901 OPEN IN FRONT P/T RH.
B1902	SHORT IN FRONT P/T RH (TO GROUND)	<ul style="list-style-type: none"> • Seat belt pretensioner harness RH circuit is shorted to ground. • Pretensioner RH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1902 SHORT IN FRONT P/T RH (TO GROUND).
B1903	SHORT IN FRONT P/T RH (TO +B)	<ul style="list-style-type: none"> • Seat belt pretensioner harness RH circuit is shorted to power supply. • Pretensioner RH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1903 SHORT IN FRONT P/T RH (TO &plus;B).
B1905	SHORT IN FRONT P/T LH	<ul style="list-style-type: none"> • Seat belt pretensioner harness LH circuit is shorted. • Pretensioner LH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1905 SHORT IN FRONT P/T LH.
B1906	OPEN IN FRONT P/T LH	<ul style="list-style-type: none"> • Seat belt pretensioner harness LH circuit is open. • Pretensioner LH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOST ICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC

			B1906 OPEN IN FRONT P/T LH.
B1907	SHORT IN FRONT P/T LH (TO GROUND)	<ul style="list-style-type: none"> • Seat belt pretensioner harness LH circuit is shorted to ground. • Pretensioner LH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1907 SHORT IN FRONT P/T LH (TO GROUND).
B1908	SHORT IN FRONT P/T LH (TO +B)	<ul style="list-style-type: none"> • Seat belt pretensioner harness LH circuit is shorted to power supply. • Pretensioner LH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1908 SHORT IN FRONT P/T LH (TO &plus;B).
B19F0	SHORT IN FRONT P/T 2 RH	<ul style="list-style-type: none"> • Lap seat belt pretensioner harness RH circuit is shorted. • Lap seat belt pretensioner RH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B19F0 SHORT IN FRONT P/T 2 RH.
B19F1	OPEN IN FRONT P/T 2 RH	<ul style="list-style-type: none"> • Lap seat belt pretensioner harness RH circuit is open. • Lap seat belt pretensioner RH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B19F1 OPEN IN FRONT P/T 2 RH.
B19F2	SHORT IN FRONT P/T 2 RH (TO GROUND)	<ul style="list-style-type: none"> • Lap seat belt pretensioner harness RH circuit is shorted to ground. • Lap seat belt pretensioner RH is faulty. • Airbag control module is faulty. 	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B19F2 SHORT IN FRONT P/T 2 RH (TO GROUND).

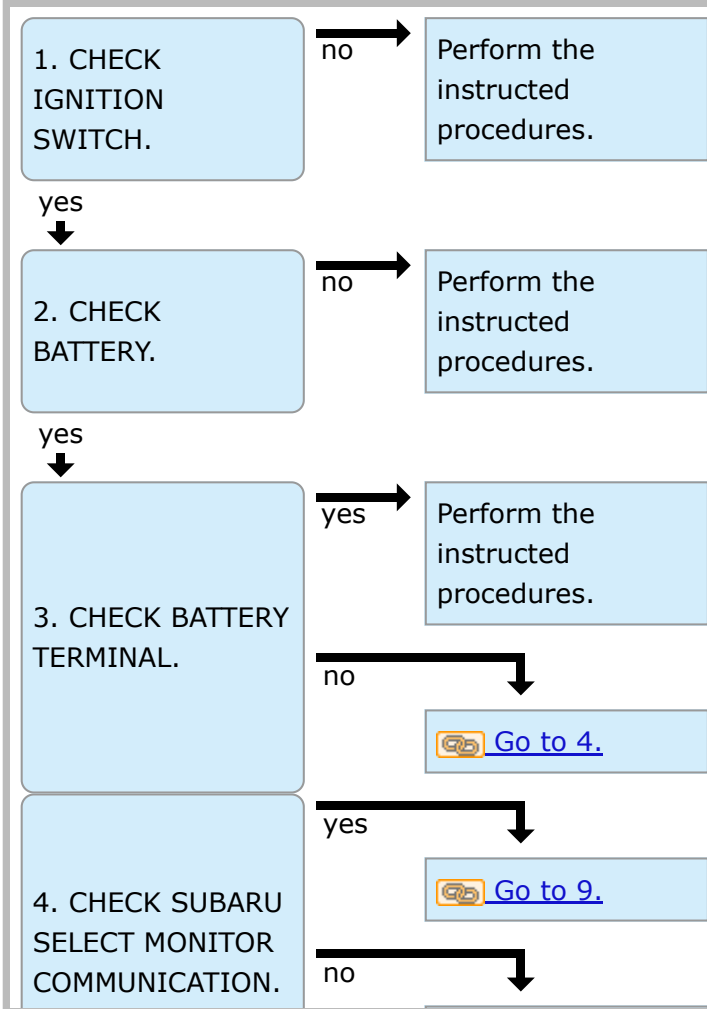
B19F3	SHORT IN FRONT P/T 2 RH (TO +B)	<ul style="list-style-type: none">• Lap seat belt pretensioner harness RH circuit is shorted to power supply.• Lap seat belt pretensioner RH is faulty.• Airbag control module is faulty.	 Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B19F3 SHORT IN FRONT P/T 2 RH (TO +B).
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AIRBAG(DIAGNOSTICS) > Subaru Select Monitor

INSPECTION

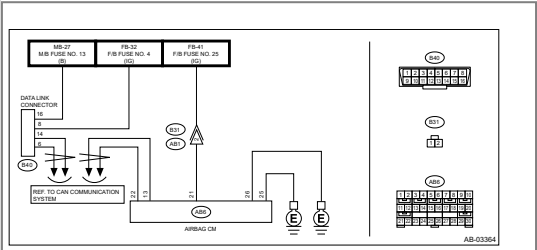
CAUTION/NOTE

INTRO



WIRING DIAGRAM:

Airbag system [Ref. to WIRING SYSTEM>System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:

Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

START

AIRBAG(DIAGNOSTICS) > Subaru Select Monitor

OPERATION

For detailed operation procedures, refer to "Application help".

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Active Test

LIST

Data	Note
Door mirror indicator active test	Outer mirror assembly indicator is illuminated.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Active Test

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)], and then select [Enter].
5. On [Select Function] display, select [Active Test].

Note:

For detailed operation procedures, refer to "Application help".

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Basic Diagnostic Procedure


PROCEDURE

1. PERFORM CUSTOMER INTERVIEW.

Using the Check List for Interview, ask the customer the condition of how trouble occurs.

Did you interview the customer?


 [Go to 2.](#)

Interview the customer.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Check List for Interview.](#)

2. CHECK SUBARU SELECT MONITOR COMMUNICATION.

Check for communication with the radar sensor.

Note:



If the communication function of the Subaru Select Monitor cannot be executed properly, check the communication circuit.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Subaru Select Monitor>INSPECTION.](#)

Is communication possible?

 [Go to 3.](#)

Check the communication circuit.

3. CHECK RADAR SENSOR.

Read the DTC and cancel code of the radar sensors LH and RH using the Subaru Select Monitor.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Cancel Code.](#)

Are any DTCs displayed?

Perform the diagnosis for the displayed DTCs and cancel code. (Perform the

diagnosis to the side that displayed the DTC.) [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#) [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>List of Cancel Code.](#)
After diagnosis, [Go to 6.](#)

No

[Go to 4.](#)

4. PERFORM DIAGNOSTICS WITH PHENOMENON.

Check the list of Diagnostics with Phenomenon. [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Diagnostics with Phenomenon.](#)

Does the symptom apply?

Yes

Perform diagnosis according to the procedures in the diagnostics with phenomenon.

No

[Go to 5.](#)

5. CHECK TROUBLE PHENOMENON.

1. Perform the basic inspection. [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>General Description>INSPECTION.](#)
2. Check the radar sensor. [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Control Module I/O Signal.](#)
3. Perform check of current data. [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Data Monitor.](#)

Was the trouble cause found?

Yes

Perform the Clear Memory after repairing or replacing the cause of trouble. [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Clear memory.](#)

No

System is normal.

6. PERFORM DIAGNOSIS.


1. Clear the memory. [Ref. to Blind Spot Detection/Rear Cross Traffic Alert](#)

[\(DIAGNOSTICS\)>Clear memory.](#)

2. Perform the Inspection Mode.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Inspection Mode.](#)

Are any DTCs displayed?

Yes

Perform the diagnosis for the displayed DTCs.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


Finish the diagnosis.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Cancel Code

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)], and then select [Enter].
5. On [Select Function] display, select [Cancel Code].

Note:

- For detailed operation procedures, refer to “Application help”.
- For details concerning cancel codes, refer to the List of Cancel Codes.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>List of Cancel Code.](#)

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Check List for Interview

CHECK

- Inspect the following items regarding the vehicle's state.
- Print out this page for interviewing customers.



Blind Spot Detection/Rear Cross Traffic Alert Check List for Interview		Date of Vehicle Bring-in Month Date Year	
Customer's name		Registration No.	Initial year of registration Year Month Date
		Vehicle model	Frame number
Interviewer	Inspector	Engine type	Odometer reading
Customer specified content • • •			
Date when problem occurred	Year Month Date	Frequency of trouble occurrence	Always occurs Sometimes occurs (times per day, times per month)
Condition of trouble occurrence (How the trouble occurs)		Weather	Fine • Cloudy • Rainy • Snowy • Others ()
		Temperature	°C (°F) — °C (°F)
Road conditions		Occurrence location	
Accessory installation condition			
Confirmation of trouble condition			
DTC			

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Clear memory

OPERATION

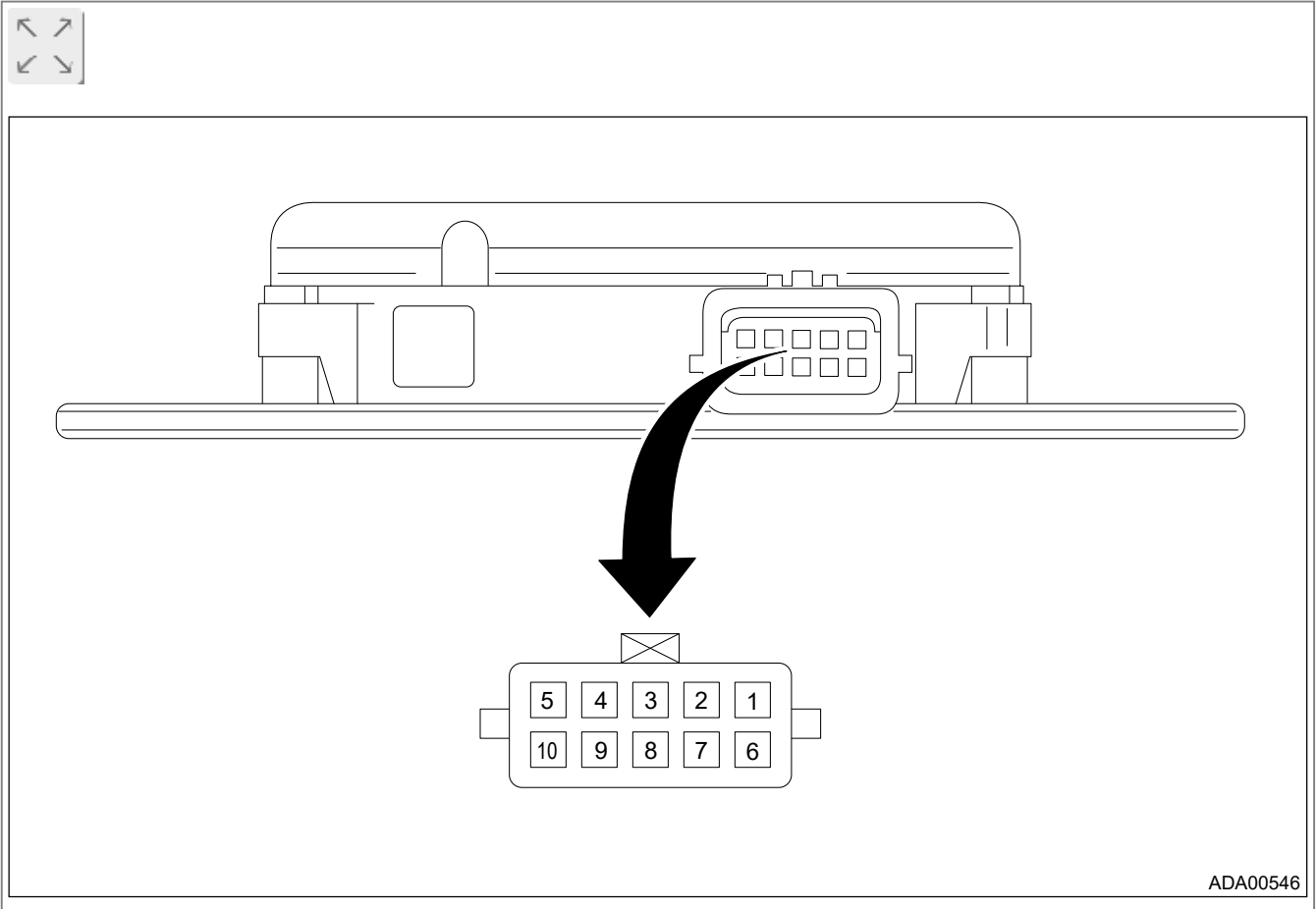
1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)], and then select [Enter].
5. On [Select Function] display, select [DTC].
6. On [DTC] display, select [Clear memory].

Note:

For detailed operation procedures, refer to "Application help".

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Control Module I/O Signal
ELECTRICAL SPECIFICATION

1. RADAR SENSOR



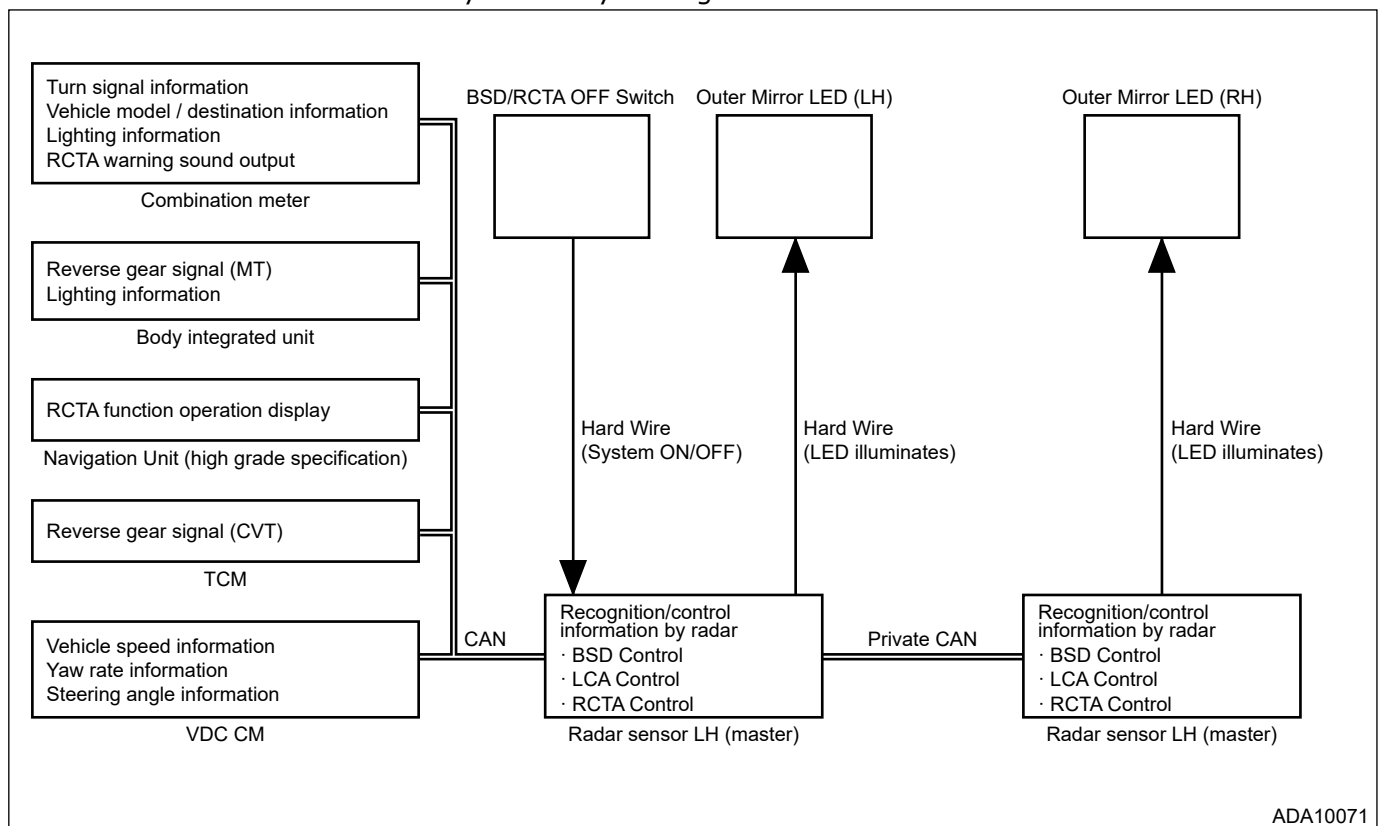
Terminal No.	[Contents]		Measuring condition	Standard
	Radar sensor LH (master)	Radar sensor RH (slave)		
1 ↔ Chassis ground	Private CAN H	Private CAN H	Always	1 MΩ or more
2 ↔ Chassis ground	Master CAN H	—	Always	1 MΩ or more
3 ↔ Chassis ground	—	—	—	—
4 ↔ Chassis ground	Left mirror LED output	Right mirror LED output	<ul style="list-style-type: none"> • Ignition switch OFF → ON • SRVD OFF switch OFF → ON 	<ul style="list-style-type: none"> • When indicator is ON: 2.5 — 10.5 V • When indicator is blinking: 0

				↔ 2.5 – 10.5 V • When indicator is OFF: Less than 1 V
5 ↔ Chassis ground	Ignition power supply	Ignition power supply	Ignition switch OFF → ON	Less than 1 V → 9 – 16 V
6 ↔ Chassis ground	Private CAN L	Private CAN L	Always	1 MΩ or more
7 ↔ Chassis ground	Master CAN L	—	Always	1 MΩ or more
8 ↔ Chassis ground	SRVD OFF switch	—	<ul style="list-style-type: none"> Ignition switch ON SRVD OFF switch OFF → ON (while holding switch on) 	Less than 1 V → 9 – 16 V
9 ↔ Chassis ground	—	—	—	—
10 ↔ Chassis ground	GND	GND	Always	Less than 1 Ω

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Control Module I/O Signal

SYSTEM BLOCK DIAGRAM


- BSD/RCTA system is configured by the following components.
- There is a control ECM in the radar sensor main body, which performs the vehicle identification and the alert judgment control.
- The LH/RH radar sensors are identified as Master/Slave for control purposes. They are connected by the private CAN to execute the controls through mutual communication. The radar on the Master side receives the input from the vehicle CAN and the SRVD OFF switch, and information necessary for control can be obtained from other modules via the vehicle CAN.
- The outer mirror LED is directly driven by the signal from the radar sensor.




Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Data Monitor

LIST

- Blind Spot Detection/Rear Cross Traffic Alert(LH)

Display	Content	Reference value	Note
SRVD System fail flag	Current failure status of BSD/RCTA system is displayed.	<ul style="list-style-type: none"> Normal NG 	—
SRVD System HALT flag	Current temporary stop status of BSD/RCTA system is displayed. Temporary stop: Temporarily stops when reception of radar sensor waves failed due to some obstacles or when the temperature is not within the range of -40°C (-40°F) — 85°C (185°F).	<ul style="list-style-type: none"> Normal Halt 	—
SRVD System ON-OFF flag	ON/OFF status of BSD/RCTA system is displayed. If this flag is set to [OFF] while the values of [SRVD System fail flag] and [SRVD System HALT flag] are [Normal], the BSD/RCTA system is set to OFF by the SRVD OFF switch.	<ul style="list-style-type: none"> OFF ON 	—
LH-Side Target detection flag	Detection status of the control target vehicle on the rear left side is displayed. Detection is possible if the target vehicle is moving when the own vehicle drives forward at 12 km/h (8 MPH) or more or backward at 0 km/h (0 MPH) or more.	<ul style="list-style-type: none"> Un-detect Detect 	—
LH-Side BSD caution 1st flag	ON is displayed when the 1st stage BSD warning on the left side is activated (when the outer mirror assembly illuminates).	<ul style="list-style-type: none"> OFF [ON] 	—
LH-Side LCA caution 1st flag	ON is displayed when the 1st stage LCA warning on the left side is activated (when the outer mirror assembly illuminates).	<ul style="list-style-type: none"> OFF ON 	—
LH-Side RCTA caution flag	ON is displayed when the RCTA warning on the left side is activated (when the outer mirror assembly illuminates and buzzer sounds).	<ul style="list-style-type: none"> OFF ON 	—
LH-Side Radar Voltage value	Power supply voltage of the radar sensor LH is displayed.	0 — 25.5 V	—
LH-Side Temperature value	Ambient temperature of the radar sensor LH is displayed.	-128 — 127°C	—
Trip Count	Time stamp information  Ref. to LAN SYSTEM (DIAGNOSTICS)>General	—	—
Count		—	—
Time Count	Description>CAUTION > TIME STAMP.	—	—

• Blind Spot Detection/Rear Cross Traffic Alert(RH)

Display	Content	Reference value	Note
SRVD System fail flag	Current failure status of BSD/RCTA system is displayed.	<ul style="list-style-type: none"> • Normal • NG 	—
SRVD System HALT flag	Current temporary stop status of BSD/RCTA system is displayed. Temporary stop: Temporarily stops when reception of radar sensor waves failed due to some obstacles or when the temperature is not within the range of -40°C (-40°F) — 85°C (185°F).	<ul style="list-style-type: none"> • Normal • Halt 	—
SRVD System ON-OFF flag	ON/OFF status of BSD/RCTA system is displayed. If this flag is set to [OFF] while the values of [SRVD System fail flag] and [SRVD System HALT flag] are [Normal], the SRVD system is set to OFF by the SRVD OFF switch.	<ul style="list-style-type: none"> • OFF • ON 	—
RH-Side Target detection flag	Detection status of the control target vehicle on the rear right side is displayed. Detection is possible if the target vehicle is moving when the own vehicle drives forward at 12 km/h (8 MPH) or more or backward at 0 km/h (0 MPH) or more.	<ul style="list-style-type: none"> • Un-detect • Detect 	—
RH-Side BSD caution 1st flag	ON is displayed when the 1st stage BSD warning on the right side is activated (outer mirror assembly illuminates).	<ul style="list-style-type: none"> • OFF • ON 	—
RH-Side LCA caution 1st flag	ON is displayed when the 1st stage LCA warning on the right side is activated (outer mirror assembly illuminates).	<ul style="list-style-type: none"> • OFF • ON 	—
RH-Side RCTA caution flag	ON is displayed when the RCTA warning on the right side is activated (when the outer mirror assembly illuminates and buzzer sounds).	<ul style="list-style-type: none"> • OFF • ON 	—
RH-Side Radar Voltage value	Power supply voltage of the radar sensor RH is displayed.	0 — 25.5 V	—
RH-Side Temperature value	Ambient temperature of the radar sensor RH is displayed.	-128 — 127°C	—
Trip Count	Time stamp information  Ref. to LAN SYSTEM (DIAGNOSTICS)>General Description>CAUTION > TIME STAMP.	—	—
Count		—	—
Time Count		—	—

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Data Monitor

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)], and then select [Enter].
5. On [Select Function] display, select [Data monitor].

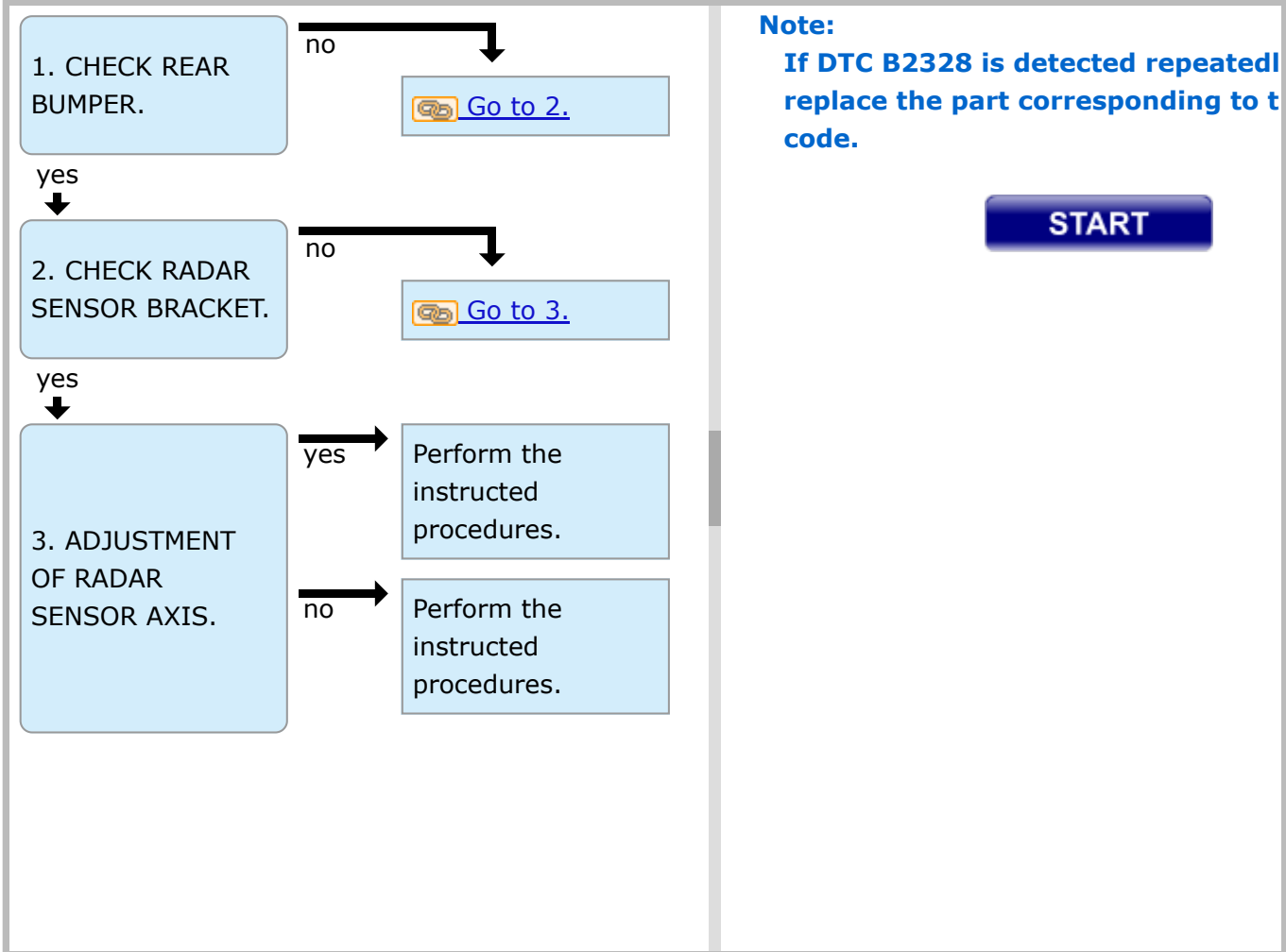
Note:

For detailed operation procedures, refer to "Application help".

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

DTC B2328 REAR RADAR INTERNAL FAILURE (RADAR MISALIGNMENT)

CAUTION/NOTE INTRO

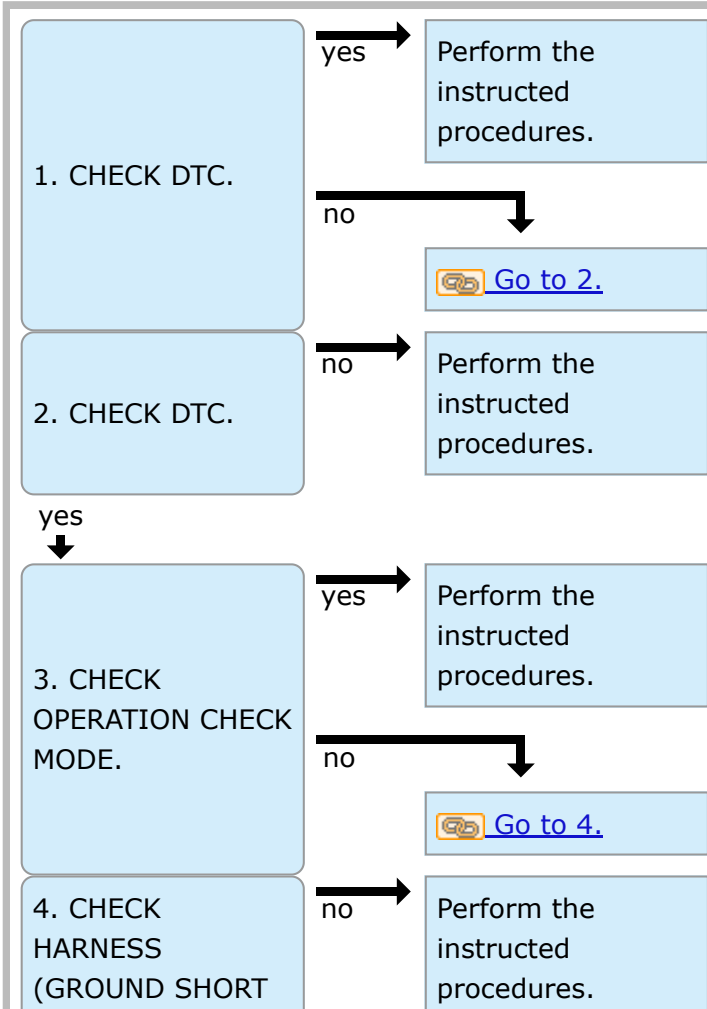


Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2300 REAR RADAR CIRCUIT LOW

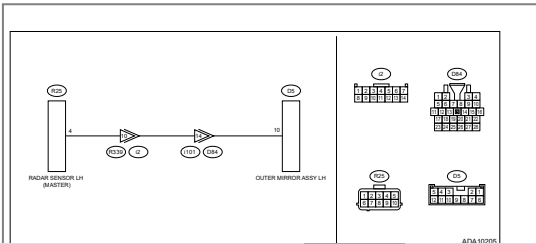
CAUTION/NOTE

INTRO



Wiring diagram:
 BSD/RCTA system Ref. to [WIRING SYSTEM](#)
[Detection/Rear Cross Traffic Alert.](#)

- Radar sensor LH



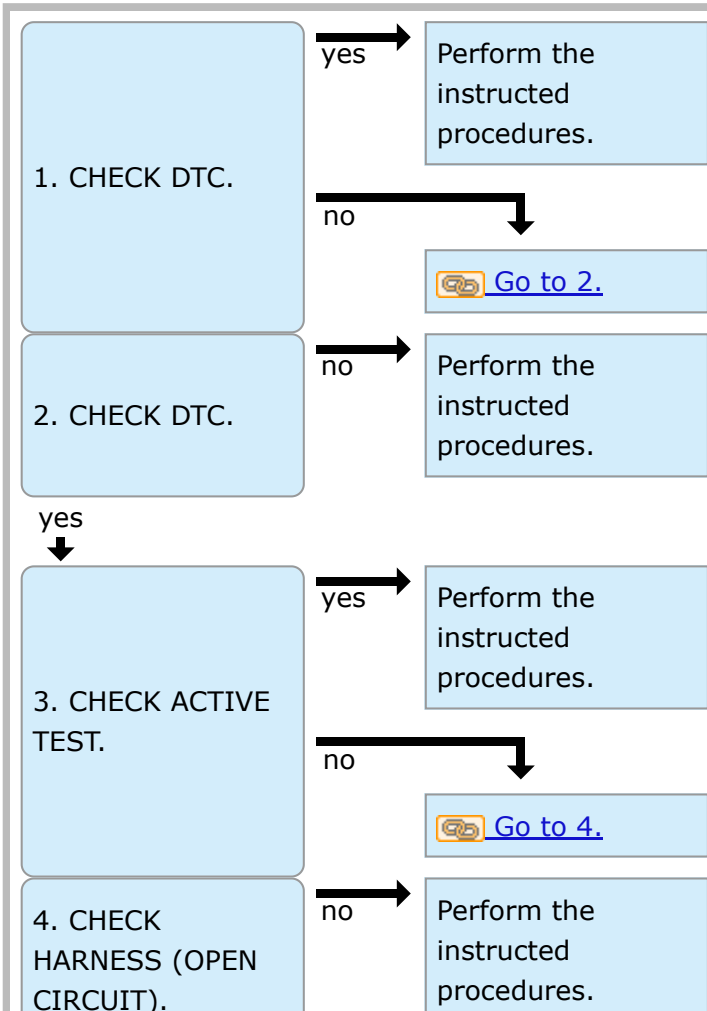
Note:
 Check and replace the side that displays the DTC.

START

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

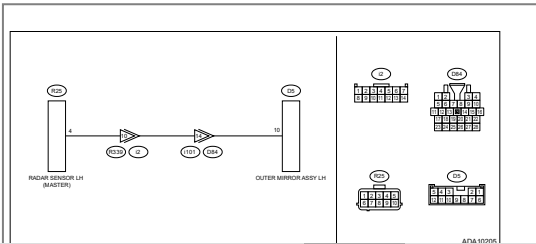
DTC B2301 REAR RADAR CIRCUIT HIGH

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 BSD/RCTA system [Ref. to WIRING SYST Detection/Rear Cross Traffic Alert.](#)

- Radar sensor LH



Note:
 Check and replace the side that dis DTC.

START

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2304 REAR RADAR ON-OFF SWITCH STUCK

DTC detecting condition:

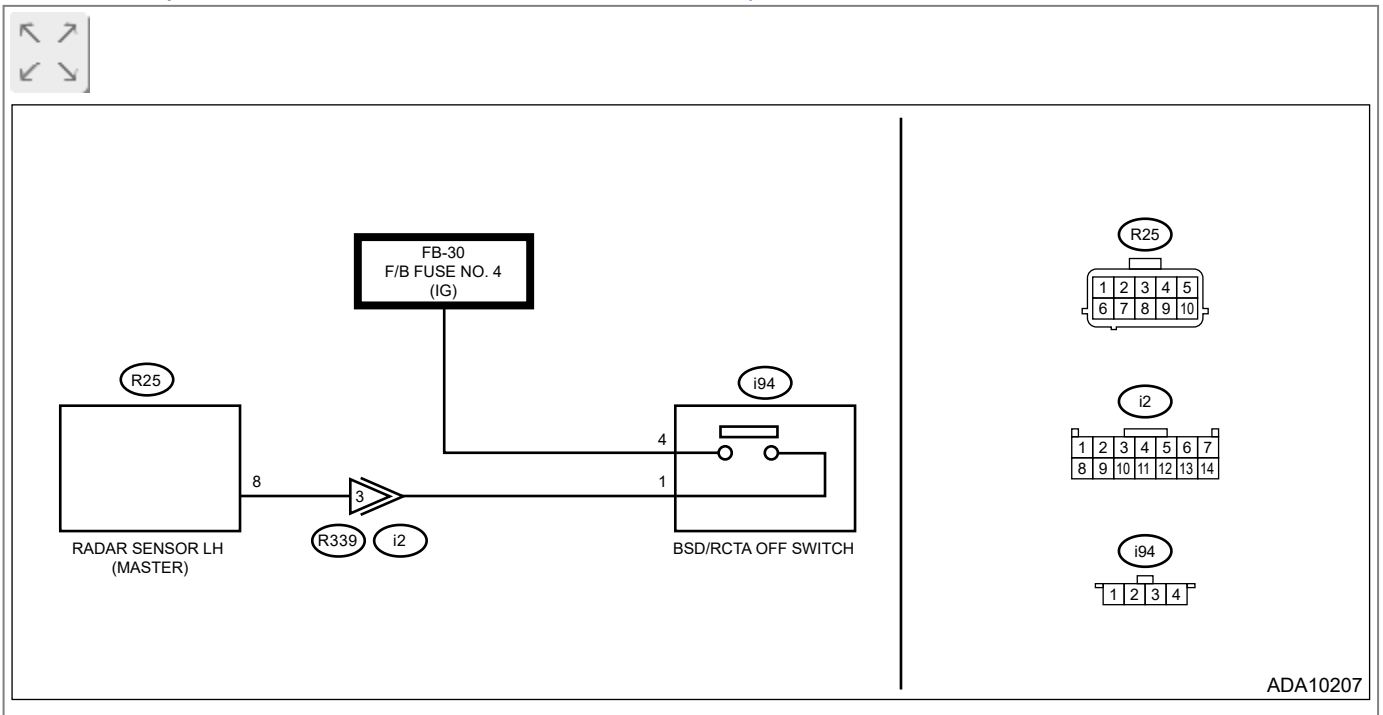
- BSD/RCTA OFF switch is stuck to ON. (Switch malfunction)
- Switch was left pressed for a prolonged time.
- Defective radar sensor

Trouble symptom:

- All functions of BSD/RCTA stop.
- Fail icon is displayed in the combination meter LCD display.
- Failure-related notification is displayed for approx. two seconds on LCD display in the combination meter.

Wiring diagram:

BSD/RCTA system  [Ref. to WIRING SYSTEM>Blind Spot Detection/Rear Cross Traffic Alert.](#)



1. CHECK METER DISPLAY.

1. Turn the ignition switch to ON.
2. Check the display of OFF indicator in the combination meter LCD display.

Does the display change according to operation of BSD/RCTA OFF switch?


Yes

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.


Note:

- **Temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
- **User may have kept pressing the switch for 30 seconds or more.**

No


 [Go to 2.](#)

2. CHECK DATA MONITOR.

Check the data monitor display [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)].  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Data Monitor.](#)

Does the display change according to operation of BSD/RCTA OFF switch?


Yes

Check the combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No

 [Go to 3.](#)

3. INSPECTION OF SWITCH UNIT.

Perform unit inspection of the BSD/RCTA OFF switch.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Switches and Harness.](#)

Is the check result OK?


Yes

 [Go to 4.](#)

No

Replace the BSD/RCTA OFF switch.

4. CHECK BATTERY.

Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery>INSPECTION.](#)

Is the check result OK?


Yes

 [Go to 5.](#)

Charge or replace the battery.

No

5. CHECK FUSE.

Check the fuse of BSD/RCTA OFF switch.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Relay and Fuse.](#)

Is the check result OK?

Yes

 [Go to 6.](#)

No

Replace the fuse. If the replaced fuse blows out easily, repair the ground short circuit in harness between the fuse — the SRVD OFF switch.

6. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the BSD/RCTA OFF switch connector.
2. Turn the ignition switch to ON.
3. Using a tester, measure the voltage between BSD/RCTA OFF switch connector and chassis ground.

Connector & terminal

(i94) No. 4 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 7.](#)

No

Repair the open circuit of harness between the fuse — the BSD/RCTA OFF switch.

7. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the radar sensor LH connector.
3. Using a tester, measure the resistance between BSD/RCTA OFF switch connector and radar sensor LH connector (harness side).

Connector & terminal

(i94) No. 1 — (R25) No. 8:

Is the resistance less than 1 Ω ?

Yes

 [Go to 8.](#)

No

Repair the open circuit of harness between BSD/RCTA OFF switch — radar sensor LH.

8. CHECK HARNESS (GROUND SHORT CIRCUIT).




Using a tester, measure the resistance between the BSD/RCTA OFF switch connector (harness side) and the chassis ground.

Connector & terminal

(i94) No. 1 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 9.](#)

No

Repair the short circuit to ground in harness between BSD/RCTA OFF switch — radar sensor LH.

9. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).




1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between the BSD/RCTA OFF switch connector (harness side) and the chassis ground.

Connector & terminal

(i94) No. 1 (+) — Chassis ground (–):

Is the voltage less than 1 V?

Yes

 [Go to 10.](#)

No

Repair the short circuit to power supply in harness between BSD/RCTA OFF switch — radar sensor LH.

10. CHECK CONNECTOR.



Check the radar sensor LH connector. (Insecure connection, poor contact, etc.)

Is the check result OK?

Yes


 [Go to 11.](#)

No

Repair the connector.


11. CHECK BSD/RCTA.



1. Restore the vehicle to its original state.
2. Perform the Inspection Mode.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Inspection Mode.](#)

Is DTC B2304 displayed? (Current malfunction)

Yes

Replace the radar sensor LH.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

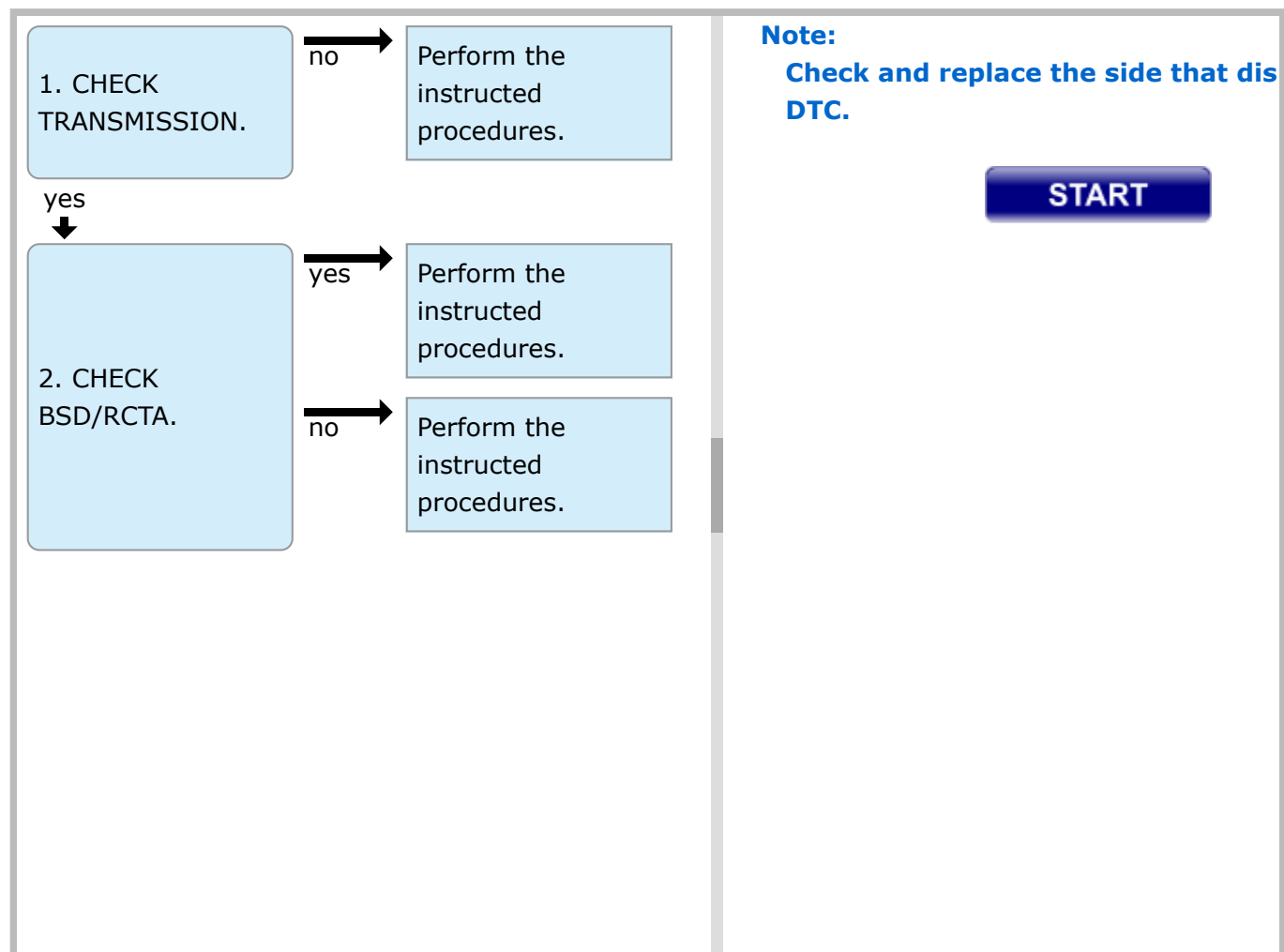
Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2311 REAR RADAR DETECT TCM

[CAUTION/NOTE](#) [INTRO](#)

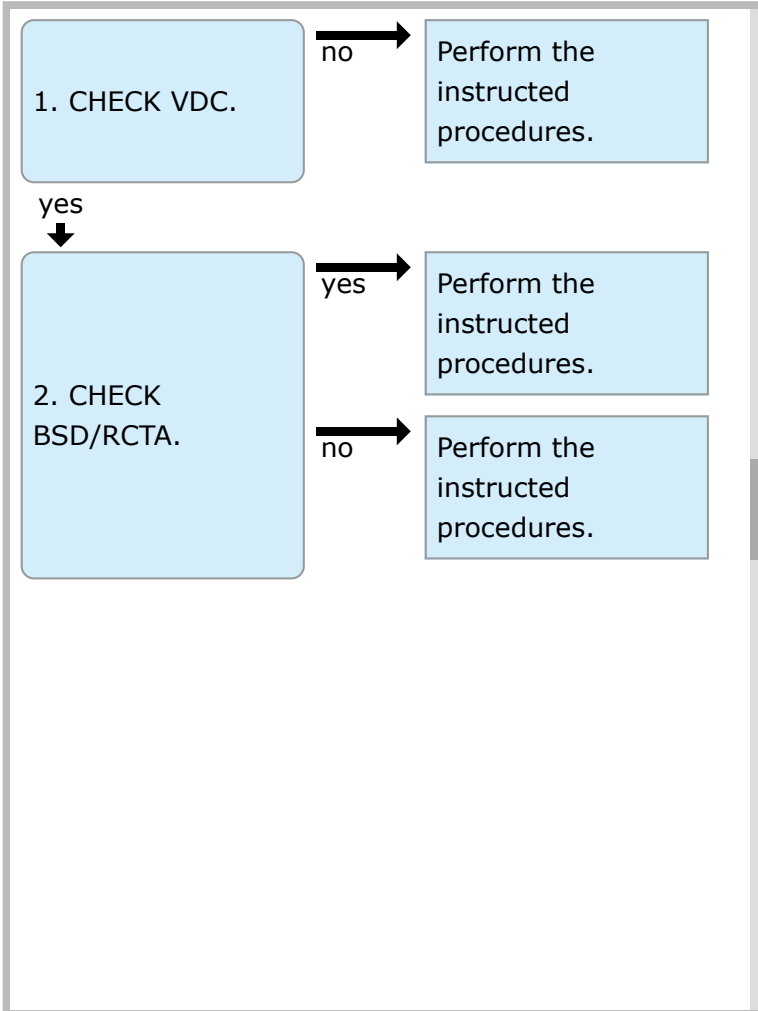


Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2313 REAR RADAR DETECT VDC

CAUTION/NOTE

INTRO



Note:
Check and replace the side that dis
DTC.

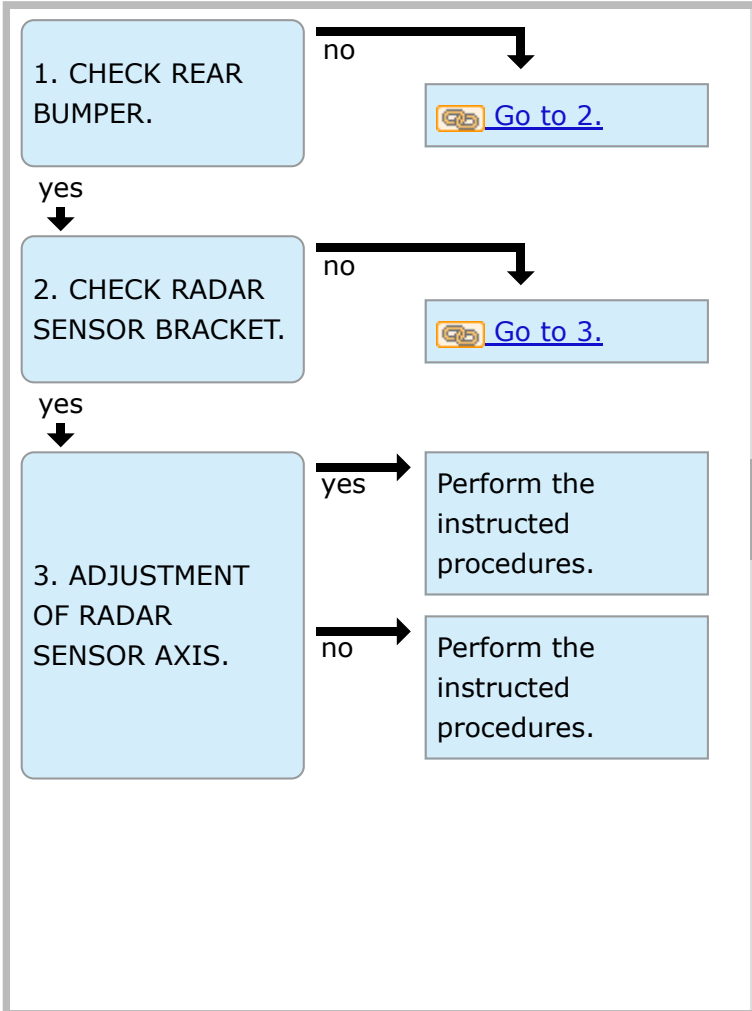
START

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2329 REAR RADAR AXIS ALIGNMENT INCOMPLETE

CAUTION/NOTE

INTRO



Note:
Check and replace the side that dis DTC.


START

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

Detected when CAN line abnormality is detected.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF

Detected when CAN line abnormality is detected.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

Detected when CAN data from ECM does not arrive.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM

Detected when CAN data from TCM does not arrive.

Note:


Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE

Detected when CAN data from BIU does not arrive.

Note:


Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"

Detected when CAN data from ECM does not arrive.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0402 INVALID DATA RECEIVED FROM TCM

Received error data from TCM.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE

Received error data from BIU.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION









1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)], and then select [Enter].
5. On [Select Function] display, select [DTC].

Note:

- For detailed operation procedures, refer to "Application help".
- For details concerning DTC, refer to the [List of Diagnostic Trouble Codes \(DTC\)](#).  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\)](#).
- Check and replace the side that displayed the DTC.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostics with Phenomenon

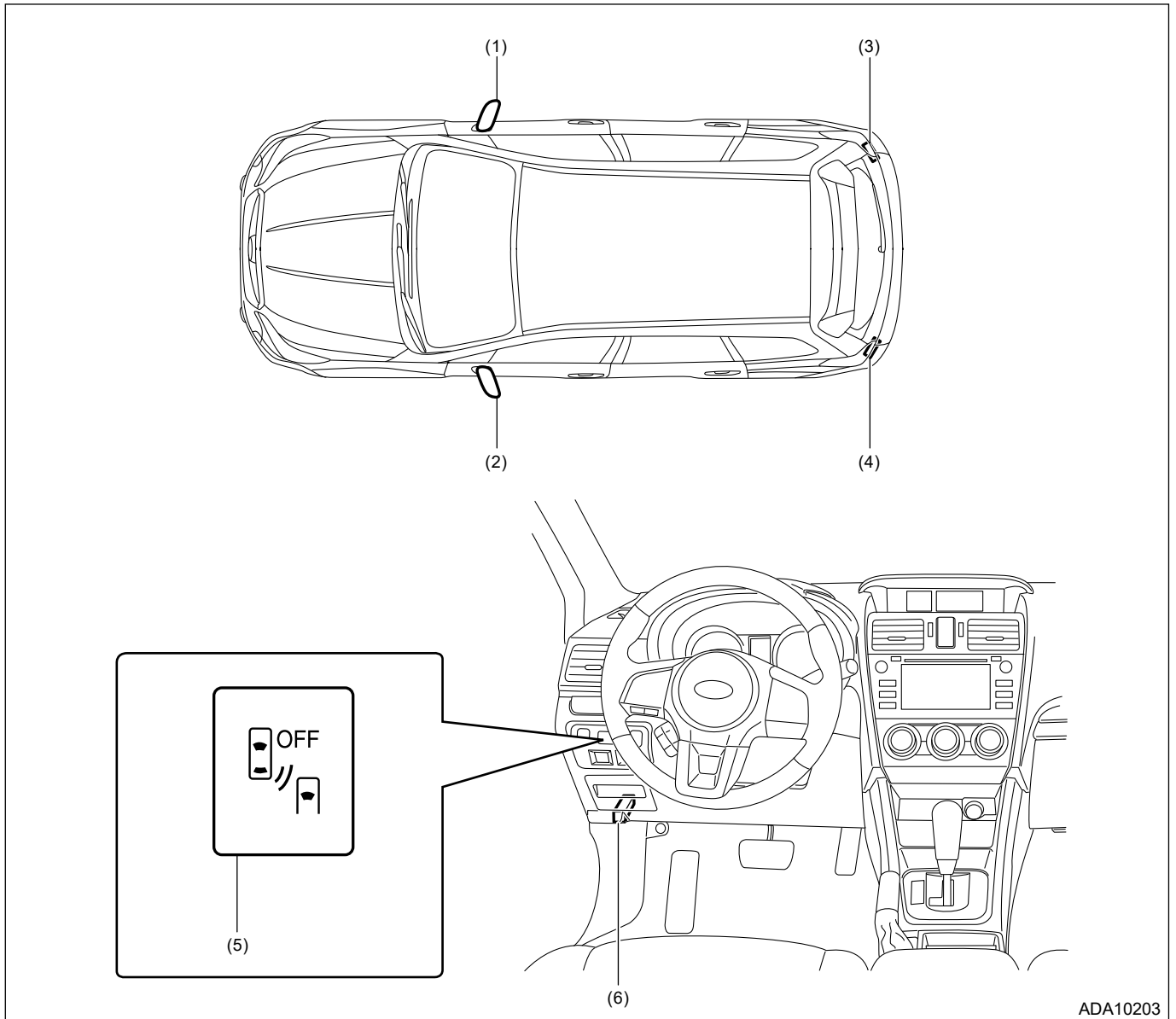
INSPECTION

Symptoms	Maintenance parts
BSD/RCTA does not operate.	Fuse
	LAN system  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
	Body control system  Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
	Radar sensor LH
	Radar sensor RH
BSD/RCTA cannot be turned OFF.	BSD/RCTA OFF switch
	LAN system  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
	Body control system  Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
	Radar sensor LH
Error message appears in the combination meter.	CHECK CANCEL CODE.  Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Cancel Code.
	Radar sensor LH
	Radar sensor RH
	Combination meter  Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.
Outer mirror assembly (LH) indicator does not illuminate.	Outer mirror assembly  Ref. to GLASS/WINDOWS/MIRRORS>Outer Mirror Assembly.
	Radar sensor LH
Outer mirror assembly (RH) indicator does not illuminate.	Outer mirror assembly  Ref. to GLASS/WINDOWS/MIRRORS>Outer Mirror Assembly.
	Radar sensor RH
Outer mirror assembly (LH) indicator remains on.	Radar sensor LH
Outer mirror assembly (RH) indicator remains on.	Radar sensor RH
Outer mirror assembly (LH) indicator does not blink.	Radar sensor LH
Outer mirror assembly (RH) indicator does not blink.	Radar sensor RH

Outer mirror assembly (LH) indicator keeps blinking.	Radar sensor LH
Outer mirror assembly (RH) indicator keeps blinking.	Radar sensor RH

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Electrical Component Location

LOCATION



ADA10203

(1) Outer mirror ASSY RH

(3) Radar sensor RH (slave)

(5) BSD/RCTA OFF switch

(2) Outer mirror ASSY LH

(4) Radar sensor LH (master)

(6) Data link connector

CAUTION

1. BSD/RCTA

1. In some cases, BSD/RCTA may not work correctly under the following conditions.
 - In bad weather such as heavy rain, fog, snow, sand storm, etc.
 - When ice, snow, dirt, etc. cover the rear bumper.
 - When the rear bumper has scratches or deformation in the area of the radar sensor.
 - When a difference of vehicle speeds between your own vehicle and another vehicle within the detection range is too large.
 - When there is another vehicle remaining within the detection range while your own vehicle starts from stationary state.
 - While driving on a steep slope with a series of uphill and downhill.
 - While driving on a wet road with such as puddles.
 - When more than one vehicle is approaching one after another with a short distance.
 - When vehicle speed of your own vehicle is almost the same as that of the vehicle within the detection range.
 - When a difference of the vehicle heights between your own vehicle and another vehicle in the next lane is too large.
 - Immediately after operating the BSD/RCTA OFF switch.
 - On wide lanes, when another vehicle of the next lane drives along the opposite edge so the distance is too large for the detection.
2. BSD/RCTA does not detect the following type of vehicles as well as objects other than vehicles.
 - Oncoming vehicle.
 - Small motorcycle, bike, pedestrian, etc.*
 - Vehicle following behind on the same lane.*
 - Stationary objects such as guardrail, wall, sign and parked vehicle.*
 - Another vehicle driving on two lanes away.*

Note:

***: Detection may be successful depending on circumstances.**

3. BSD/RCTA may perform unnecessary detection in the following conditions.
 - When guardrails or walls are close enough to be within the detection range.
 - When distance from the vehicle behind is short.
 - On narrow lanes, when another vehicle driving on two lanes away enters the detection range.
4. Radar sensors of BSD/RCTA are each located on LH and RH sides. Always observe the followings for proper operation of the system.
 - Always clean the vicinity of radar sensors.
 - Do not give a strong impact to the radar sensor areas. Displacement of the radar sensors may result in improper operation of the system such that it may not detect the vehicle entering the detection range.
 - Do not disassemble the radar sensors.
 - Do not scratch or deform the bumper areas with the radar sensors.

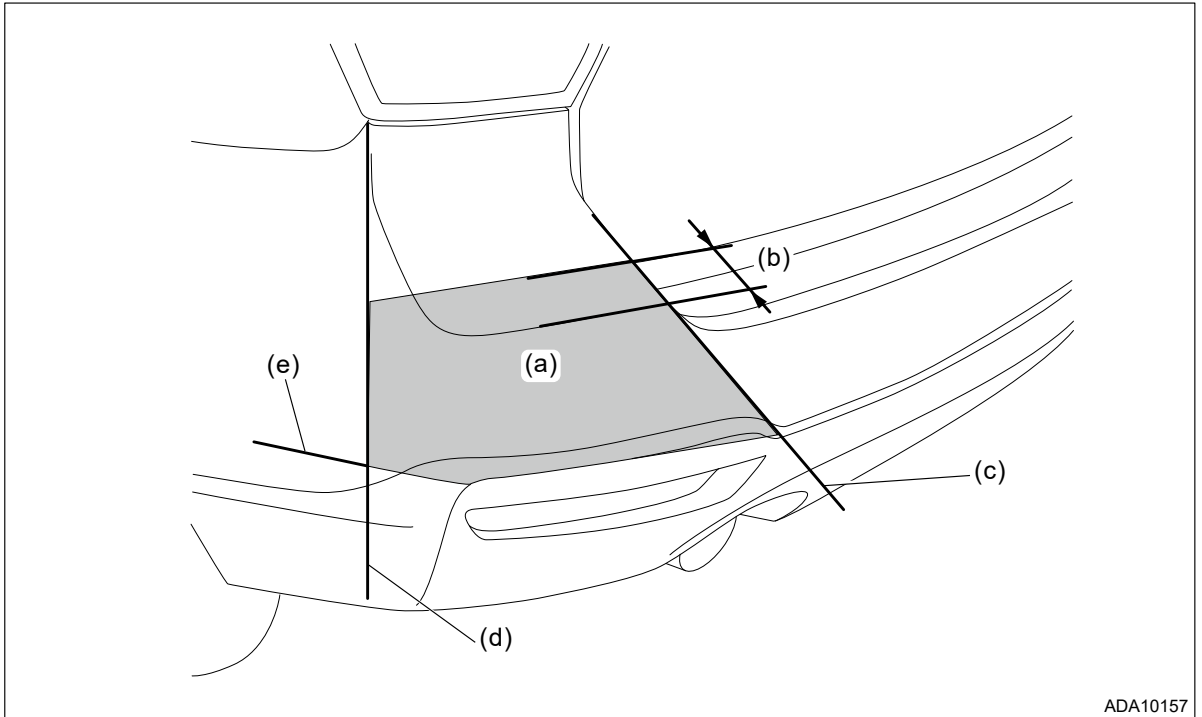
Note:

Replace the rear bumper in the following cases.

- **When there is any collision trace or dent inside the radar projection area.**
- **When there is any scuffed (chipped off) section inside the radar projection area on the resin bumper.**
- **When there is any crack inside the radar projection area.**

Note:

Radar projection area



(a) Radar projection area

(b) 50 mm (2.0 in)

(c) Extended line

(d) Vertical line

(e) Horizontal line

For other flaws, perform the sensor readjustment. If no problem is found, replacement is unnecessary.

- Do not put a sticker, etc. on/around the radar sensors.
- Do not retrofit the radar sensors or the bumper close to the radar sensors.
- Do not repaint the radar sensors or the bumper close to the radar sensors.

Note:

If there is any painting defect inside the radar projection area, replace the rear bumper without trying to repair it.




- Do not give a strong impact, force or drop-off to the radar sensors because they are precision devices.
- Do not reuse the radar sensors that were affected by strong impact, force, or fell off.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > General Description

INSPECTION

1. BASIC INSPECTION


Before performing diagnosis, check the following items that might provoke the problems related to BSD/RCTA.

- 1.** Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)  [Ref. to STARTING/CHARGING SYSTEMS\(H4DOTC\)>General Description.](#)
- 2.** Check the relay and fuse condition.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Relay and Fuse.](#)
- 3.** Check the connecting condition of harness and connector.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	— (Newly adopted tool)	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.



Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Inspection Mode

OPERATION

It is possible to diagnose the DTC by performing the indicated inspection mode. After correcting the DTC, perform a necessary inspection mode and make sure that the function is resumed correctly and the DTC is recorded.

1. INSPECTION MODE 1

DTC	Item	Note
U0073	U0073U0073CONTROL MODULE COMMUNICATION BUS OFF	—
U0074	CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF	—
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	—
U0101	LOST COMMUNICATION WITH TCM	—
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	—
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	—
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	—
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	—
U0402	INVALID DATA RECEIVED FROM TCM	—
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	—
U0422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE	—
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	—
B2304	REAR RADAR ON-OFF SWITCH STUCK	—
B2311	REAR RADAR DETECT TCM	—
B2313	REAR RADAR DETECT VDC	—
B2327	REAR RADAR INTERNAL FAILURE (INTERNAL ELECTRIC CIRCUIT)	—
B2350	REAR RADAR COMMUNICATION ERROR BETWEEN MASTER AND SLAVE	—


1. Clear the memory.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Clear memory.](#)
2. Read the DTC and check that the DTC is not displayed.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).

3. Start the engine and wait for 30 seconds or more.
4. Read the DTC and check that the DTC is not displayed.

Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)



2. INSPECTION MODE 2

DTC	Item	Note
B2300	REAR RADAR CIRCUIT LOW	—
B2301	REAR RADAR CIRCUIT HIGH	—


1. Perform the Clear Memory Mode.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Clear memory.](#)
2. Read the DTC and check that the DTC is not displayed.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).

3. Start the engine.
4. Perform the active test [Door mirror indicator active test].  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Active Test.](#)
5. Read the DTC and check that the DTC is not displayed.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

3. INSPECTION MODE 3

DTC	Item	Note
B2329	REAR RADAR AXIS ALIGNMENT INCOMPLETE	—


1. Perform the Clear Memory Mode.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Clear memory.](#)
2. Read the DTC and check that the DTC is not displayed.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).


3. Perform the adjustment of radar axis.
4. Read the DTC and check that the DTC is not displayed.

Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)










Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > List of Cancel Code











LIST


Code	Item	Contents of diagnosis
B2320	REAR RADAR LOW VOLTAGE (LESS THAN 9V)	Temporarily stops because the voltage supplied to radar drops to or below 9 V. Returns to normal when the voltage becomes normal.
B2321	REAR RADAR HIGH VOLTAGE (MORE THAN 16V)	Temporarily stops because the voltage supplied to radar rises to or above 16 V. Returns to normal when the voltage becomes normal.
B2328	REAR RADAR INTERNAL FAILURE (RADAR MISALIGNMENT)	Deviation of the radar axis prevents normal detection. Returns to normal when the radar axis becomes normal. When B2328 is frequently detected, perform "Diagnostic Procedure with Cancel Code".  Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>DTC B2328 REAR RADAR INTERNAL FAILURE (RADAR MISALIGNMENT).
B2340	RADAR ASSY B&S OUT OF OPERATION TEMPERATURE RANGE	Temporarily stops because the temperature is outside the operative range (−40°C (−40°F) — 85°C (185°F)). Returns to normal when the ambient temperature falls within the operative range.
B2341	REAR RADAR DEGRADATION OF DETECTING PERFORMANCE	Temporarily stops because some obstacles blocked radar waves of the back and side radar. Returns to normal when the transmission and reception of radar signals becomes normal.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > List of Diagnostic Trouble Code (DTC)

LIST

DTC	Item	Reference
B2300	REAR RADAR CIRCUIT LOW	 Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2300 REAR RADAR CIRCUIT LOW.
B2301	REAR RADAR CIRCUIT HIGH	 Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2301 REAR RADAR CIRCUIT HIGH.
B2304	REAR RADAR ON-OFF SWITCH STUCK	 Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2304 REAR RADAR ON-OFF SWITCH STUCK. Note: Detect the radar sensor LH (master) only.
B2311	REAR RADAR DETECT TCM	 Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2311 REAR RADAR DETECT TCM.
B2313	REAR RADAR DETECT VDC	 Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2313 REAR RADAR DETECT VDC.
B2327	REAR RADAR INTERNAL FAILURE (INTERNAL ELECTRIC CIRCUIT)	 Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2327 REAR RADAR INTERNAL FAILURE (INTERNAL ELECTRIC CIRCUIT).
B2329	REAR RADAR AXIS ALIGNMENT INCOMPLETE	 Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2329 REAR RADAR AXIS ALIGNMENT INCOMPLETE.
B2350	REAR RADAR COMMUNICATION ERROR BETWEEN MASTER AND SLAVE	 Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2350 REAR RADAR COMMUNICATION ERROR BETWEEN MASTER AND SLAVE.
U0073	CAN FAILURE, BUS 'OFF' DETECTION	 Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with

		Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0074	CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF	 Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	 Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0101	LOST COMMUNICATION WITH TCM	 Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	 Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	 Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	 Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	 Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".
U0402	INVALID DATA RECEIVED FROM TCM	 Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0402 INVALID DATA RECEIVED FROM TCM.
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	 Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE	 Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with

		Diagnostic Trouble Code (DTC)>DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE.
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	 Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Subaru Select Monitor

INSPECTION

When communication with the radar sensor is impossible

Detecting condition:

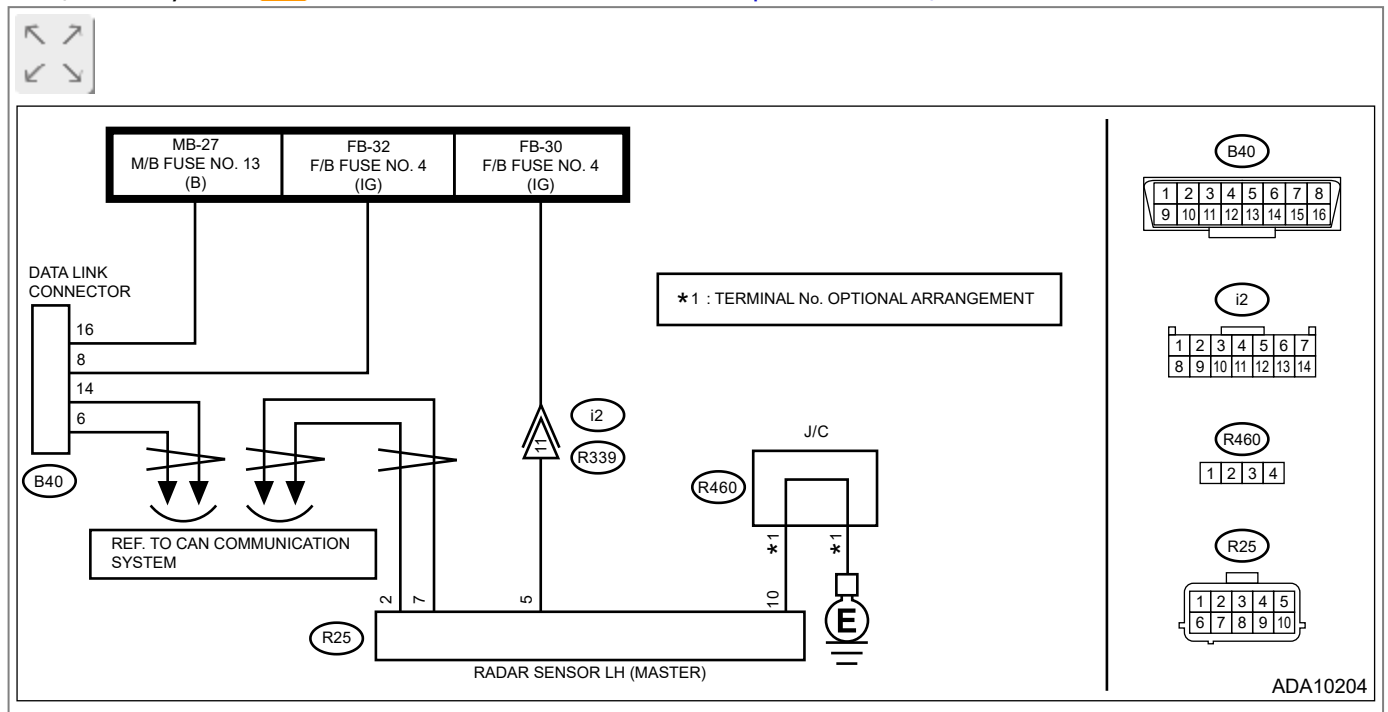
- Defective harness connector
- Power supply circuit malfunction
- Defective radar sensor
- Defective CAN communication circuit
- Defective Subaru Select Monitor

Trouble symptom:

Communication is impossible between radar sensor and Subaru Select Monitor.

Wiring diagram:

BSD/RCTA system  [Ref. to WIRING SYSTEM>Blind Spot Detection/Rear Cross Traffic Alert.](#)




1. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse for radar sensor LH.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Relay and Fuse.](#)

Is the check result OK?

Yes

 [Go to 2.](#)

No

Replace the fuse. If the replaced fuse has blown out immediately, repair the short circuit to ground in harness between fuse — radar sensor LH.

2. CHECK HARNESS (OPEN CIRCUIT).




1. Disconnect the radar sensor LH connector.
2. Turn the ignition switch to ON.
3. Using a tester, measure the voltage between radar sensor LH connector (harness side) and chassis ground.

Connector & terminal

(R25) No. 5 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 3.](#)

No

Repair the open circuit of harness between fuse — radar sensor LH connector. For models with Auto Start Stop, also check the Auto Start Stop system.

3. CHECK HARNESS (OPEN CIRCUIT).




1. Turn the ignition switch to OFF.
2. Using a tester, measure the resistance between radar sensor LH connector (harness side) and chassis ground.

Connector & terminal

(R25) No. 10 — Chassis ground:

Is the resistance less than 1 Ω ?

Yes


 [Go to 4.](#)

No

Repair the open circuit in harness between radar sensor and chassis ground.

4. CHECK LAN SYSTEM.



1. Connect the radar sensor LH connector.
2. Inspect LAN system.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is the check result OK?

Yes

 [Go to 5.](#)

No

Perform the inspection according to the diagnosis for LAN system.

5. CHECK RADAR SENSOR.



Communicate with the radar sensor.

Is communication possible?


Yes

The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:


In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

Replace the radar sensor LH.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor.](#)

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Subaru Select Monitor

OPERATION

- For detailed operation procedures, refer to "Application help".
- When the radar sensor cannot communicate with Subaru Select Monitor, check the communication circuit.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Subaru Select Monitor>INSPECTION.](#)

BODY CONTROL(DIAGNOSTICS) > Active Test

OPERATION

Note:

For the active test of the body control, activate the actuator using Subaru Select Monitor without operating switches in order to inspect the body integrated unit and actuator.

- 1.** On [Start] display, select [Diagnosis].
- 2.** On [Vehicle selection] display, input the target vehicle information and select [OK].
- 3.** On [Main Menu] display, select [Each System].
- 4.** On [Select System] display, select [Body Control], and then select [Enter].
- 5.** On [Select Function] display, select [Active Test].

Note:

- If not equipped (depending on destination area or vehicle equipment condition), process will not go on.**
- The operation is disabled for the models with keyless access with push button start system because the key lock solenoid is not installed.**
- For detailed operation procedures, refer to "Application help".**


BODY CONTROL(DIAGNOSTICS) > Basic Diagnostic Procedure

PROCEDURE


Caution:

- **Subaru Select Monitor is required for reading DTC, performing diagnosis and reading data monitor.**
- **Remove foreign matter (dust, water, oil, etc.) from the body integrated unit connector during removal and installation.**
- **Registration of immobilizer may be needed after the replacement of control modules, etc. For detailed procedure, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**

Note:

- **To check harness for open or short circuits, shake the suspected trouble spot or connector.**
- **Check List for Interview  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Check List for Interview.](#)**

1. CHECK PRE-INSPECTION.


Ask the customer when and how the trouble occurred using the interview check list.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Check List for Interview.](#)

Did you interview the customer?

 [Go to 2.](#)

Interview the customer.

2. BASIC INSPECTION.

Check components which might affect body control.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>General Description>INSPECTION.](#)

Is the check result of the component that might influence the body control problem OK?

 [Go to 3.](#)

Repair or replace each component.

3. CHECK DTC.

1. Read the DTC. [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Note:

If the communication function of the Subaru Select Monitor cannot be executed properly, check the communication circuit. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Subaru Select Monitor>COMMUNICATION FOR INITIALIZING IMPOSSIBLE.](#)

2. Record all DTCs, time stamp and freeze frame data.

Note:

For time stamp, refer to "LAN SYSTEM". [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>General Description>CAUTION > TIME STAMP.](#)

Is DTC displayed on Subaru Select Monitor?

Yes

Perform the diagnosis for the displayed DTCs. [Ref. to BODY CONTROL\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#) After diagnosis, [Go to 6.](#)

No

[Go to 4.](#)

4. CHECK PHENOMENON LIST.

Check the "Phenomenon List". [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostics with Phenomenon>LIST.](#)

Is there a symptom that corresponds in the phenomenon list?

Yes

Perform diagnosis according to the procedures in the phenomenon list.

No

[Go to 5.](#)

5. PERFORM GENERAL DIAGNOSTICS.

Inspect using the "General Diagnostic Table". [Ref. to BODY CONTROL\(DIAGNOSTICS\)>General Diagnostic Table.](#)

Is the check result OK?

Yes



The body control system is normal.

No

[Go to 6.](#)


6. PERFORM DIAGNOSIS.



1. Perform the clear memory operation.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Clear memory.](#)
2. Read the DTC.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC displayed on Subaru Select Monitor?

Yes

Perform the diagnosis for the displayed DTCs.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Finish the diagnosis.

BODY CONTROL(DIAGNOSTICS) > Check List for Interview

CHECK

1. BODY CONTROL

Inspect the following items regarding the vehicle's state.



Body Control System Check List for Interview Date of Vehicle Bring-in Year Month Day			
Customer's name		Registration No.	Initial year of registration Year Month Date
		Vehicle model	Frame number
Interviewer	Inspector	Engine type	Odometer reading
Customer specified content			
Date and time when the trouble occurred		Frequency of trouble occurrence	
Condition of trouble occurrence		Weather	
Road conditions		Occurrence location	
Accessory installation condition			
Trouble condition			
<input type="checkbox"/> Diagnostic trouble code			<input type="checkbox"/> ()

2. HIGH BEAM ASSIST

Inspect the following items regarding the vehicle's state.



High Beam Assist Check List for Interview Date of Vehicle Bring-in Year Month Day			
Customer's name		Registration No.	Initial year of registration Year Month Date
		Vehicle model	Frame number
Interviewer	Inspector	Engine type	Odometer reading
Customer specified content			
Date and time when the symptom occurred	Year Month Date Approximate time		
Frequency of symptom	Always occurs		

occurrence	Sometimes occurs (times per day/ times per month)		
Conditions upon symptom occurrence	Weather	• Fine • Cloudy • Rainy • Snowy • Foggy	
		• Other ()	
	Temperature	°C (°F) — °C (°F)	
	Vehicle speed	km/h (MPH) — km/h (MPH)	
	Road surface conditions	• Dry • Wet • Accumulated snow • Unpaved road • Bumps (uneven)	
		Other ()	
	Road conditions	Own vehicle	• Straight
			• Gentle right-hand curve
			• Gentle left-hand curve
			• Sharp right-hand curve
			• Sharp left-hand curve
			• Uphill
• Downhill			
• Intersection			
• Top of the hill			
• Other ()			
Oncoming vehicle * Relative position from user's viewpoint		• No oncoming vehicle	
		• Straight	
	• Gentle right-hand curve		
	• Gentle left-hand curve		
	• Sharp right-hand curve		
	• Sharp left-hand curve		
	• Uphill		
	• Downhill		
Headlight of oncoming vehicle * When the type is unknown, indicate the color.	• HID/LED (white)		
	• Halogen		
	• Only one side was lit		
	• Other ()		
Preceding vehicle	• No preceding vehicle		
	• Straight		
	• Gentle right-hand curve		
	• Gentle left-hand curve		

		<ul style="list-style-type: none"> • Sharp right-hand curve
		<ul style="list-style-type: none"> • Sharp left-hand curve
		<ul style="list-style-type: none"> • Uphill
		<ul style="list-style-type: none"> • Downhill
		<ul style="list-style-type: none"> • Intersection
		<ul style="list-style-type: none"> • Top of the hill
		<ul style="list-style-type: none"> • Other ()
	Number of street light ahead	<ul style="list-style-type: none"> • 0 • 1 • 2 • 3 • 4 • 5 • 5 or more ()
	Reflection board/Signs	<ul style="list-style-type: none"> • 0 • 1 • 2 • 3 • 4 • 5 • 6 or more () • Red • White • Blue • Other ()
Vehicle status	Number of passengers:	
	(Front seats: /Rear seats:)	
	Cargo room load capacity kg (lb)	
	Tire inflation pressure (when vehicle was brought in)	
	<ul style="list-style-type: none"> • Front wheel kPa (psi) • Rear wheel kPa (psi) 	
Driving duration and distance with the described load condition	<ul style="list-style-type: none"> • Distance km (mile) • Time minutes 	
Driving environment before symptom occurrence (approximately 10 minutes before the occurrence)	<ul style="list-style-type: none"> • Inner city (surroundings are bright by street lights) • Suburbs (surroundings are relatively dark due to sparse street lights) 	

Accessory installation condition	
Diagnostic Trouble Code	
Other Note: <ul style="list-style-type: none">• Describe things that were noticed, if any.• Attach illustration or photo of the road ahead of the vehicle at the time of the symptom occurrence.	

BODY CONTROL(DIAGNOSTICS) > Clear memory

OPERATION

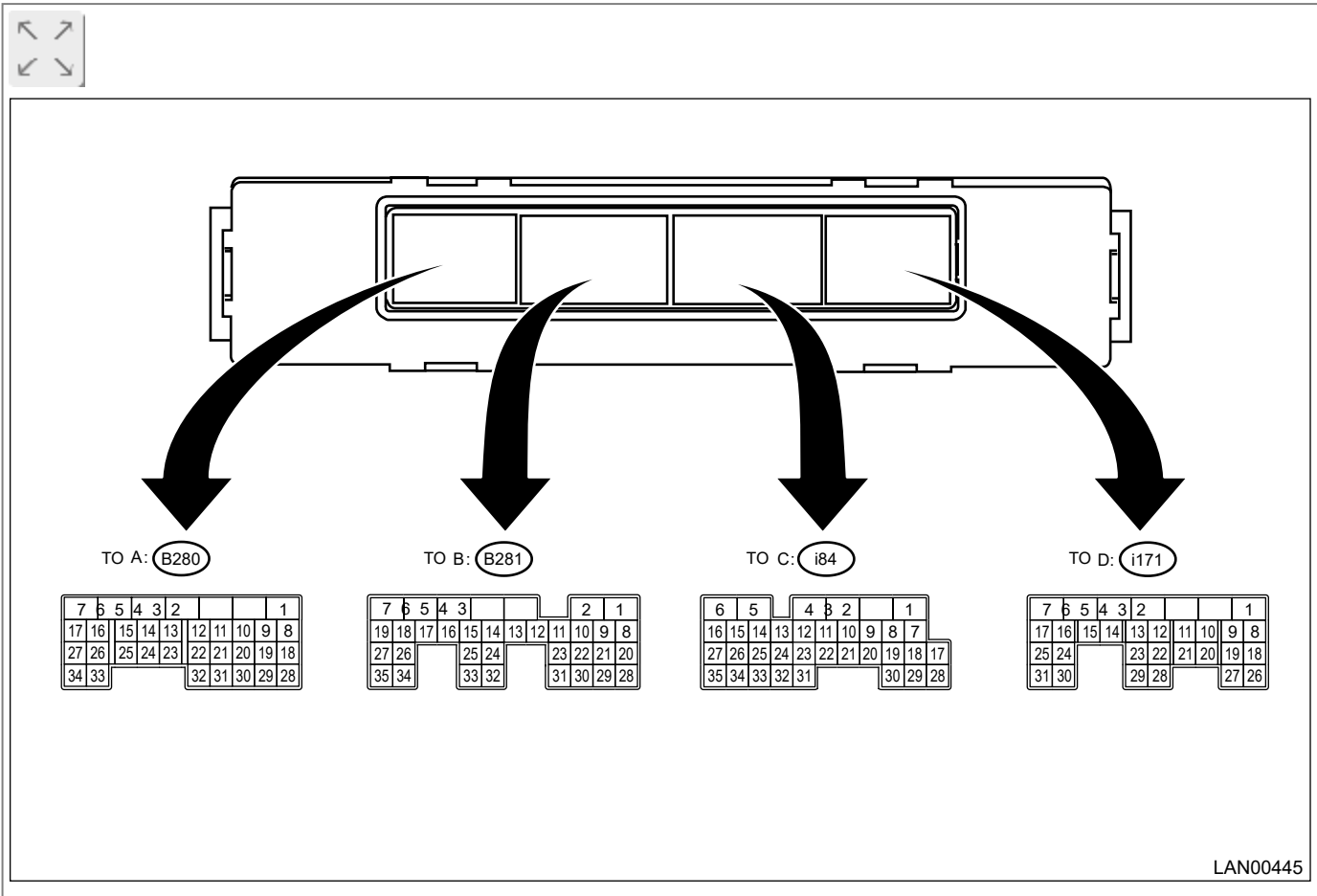
1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Body Control], and then select [Enter].
5. On [Select Function] display, select [DTC].
6. On [DTC] display, select [Clear memory].

Note:

For detailed operation procedures, refer to "Application help".

BODY CONTROL(DIAGNOSTICS) > Control Module I/O Signal

ELECTRICAL SPECIFICATION



LAN00445

Description	Terminal No.	Signal (V or Ω)	Note
		Ignition switch ON (engine OFF)	
Ignition power supply (rear wiper)	A5 ↔ Chassis ground	Less than 1.5 V → 10 – 13 V	Ignition ON
Battery power supply (shift lock/key lock)	B6 ↔ Chassis ground	10 – 13 V	Always
Battery power supply (door lock)	D1 ↔ Chassis ground	10 – 13 V	Always
Battery power supply (control)	C6 ↔ Chassis ground	10 – 13 V	Always
Ground	A1 ↔ Chassis ground	Less than 1.5 V	Always
	C1 ↔ Chassis ground		
Battery power supply (back-up)	B7 ↔ Chassis ground	10 – 13 V	Always
Ignition power supply	B3 ↔ Chassis ground	Less than 1.5 V → 10 – 13 V	Ignition ON

ACC power supply	A32 ↔ Chassis ground	Less than 1.5 V → 10 – 13 V	ACC ON
Key-in switch	A4 ↔ Chassis ground	Less than 1.5 V → 10 – 13 V	When key is inserted (model without the keyless access with push button start)
ACC input			ACC ON (model with the keyless access with push button start)
P range SW	B18 ↔ Chassis ground	8 V or more → less than 1.5 V	Shift lever shifted from P range to other than P range
Stop light SW	A10 ↔ Chassis ground	Less than 1.5 V → 8 V or more	Stop light switch OFF → ON
Door SW (driver's)	C14 ↔ Chassis ground	8 V or more → less than 1.5 V	With driver's door closed → opened
Door SW (passenger's)	C13 ↔ Chassis ground	8 V or more → less than 1.5 V	With passenger's door closed → opened
Door SW (rear right)	C25 ↔ Chassis ground	8 V or more → less than 1.5 V	Rear right door closed → open
Door SW (rear left)	C24 ↔ Chassis ground	8 V or more → less than 1.5 V	Rear left door closed → open
Rear gate/trunk SW	C33 ↔ Chassis ground	8 V or more → less than 1.5 V	Rear gate/trunk closed → open
Opener SW (trunk/rear gate)	C10 ↔ Chassis ground	8 V or more → less than 1.5 V	Rear gate/trunk opener switch ON
Manual switch (LOCK)	C9 ↔ Chassis ground	8 V or more → less than 1.5 V	Door lock switch ON
Manual switch (UNLOCK)	C20 ↔ Chassis ground	8 V or more → less than 1.5 V	Door unlock switch ON
Door lock state SW driver's	C12 ↔ Chassis ground	8 V or more → less than 1.5 V	Driver's inner remote lock → unlock
Door lock state SW passenger's	C23 ↔ Chassis ground	8 V or more → less than 1.5 V	Passenger's inner remote lock → unlock
Lighting AUTO SW	B16 ↔ Chassis ground	8 V or more → less than 1.5 V	Switch at AUTO position
Lighting II SW	A34 ↔ Chassis ground	8 V or more → less than 1.5 V	Switch at II position
	B34 ↔ Chassis ground		
Lighting I SW	B17 ↔ Chassis ground	8 V or more → less than 1.5 V	Switch at I position
Dimmer passing SW	B25 ↔ Chassis ground	8 V or more → less than 1.5 V	Switch at passing position
Dimmer Hi beam SW	B15 ↔ Chassis ground	8 V or more → less than	Switch at Hi beam

		1.5 V	position
Front fog light SW	B26 ↔ Chassis ground	8 V or more → less than 1.5 V	Front fog light switch ON
Illumination sensor power supply	B1 ↔ A29	Less than 1.5 V → 4.5 V or more	Ignition switch OFF → ON
Illumination sensor signal	A19	0.2 – 4.5 V	Ignition switch OFF → ON
Ground (illumination sensor)	A29 ↔ Chassis ground	Less than 1.5 V	Always
Rear wiper SW ON	A12 ↔ Chassis ground	8 V or more → less than 1.5 V	Switch at ON position
Rear wiper SW INT	A22 ↔ Chassis ground	8 V or more → less than 1.5 V	Switch at INT position
Rear washer SW	A30 ↔ Chassis ground	8 V or more → less than 1.5 V	Switch at ON position
Illumination SW (Vi1)	D12 ↔ Chassis ground	Approx. 5 V	While clearance light illuminates
Illumination SW (Vi2)	D22 ↔ Chassis ground	0.5 – 4.8 V	
Illumination SW (Vi3)	D28 ↔ Chassis ground	Less than 1.5 V	Always
Bright SW	C21 ↔ Chassis ground	8 V or more → less than 1.5 V	Switch at ON position
Reverse SW (MT)	B12 ↔ Chassis ground	Less than 1.5 V → 8 V or more	Reverse SW ON
Hi-speed CAN communication circuit 1 (Hi)	B20	Serial communication	Except for sleep status
Hi-speed CAN communication circuit 1 (Lo)	B28		*1
Hi-speed CAN communication circuit 2 (Hi)	C27	Serial communication	Except for sleep status
Hi-speed CAN communication circuit 2 (Lo)	C35		*1
LIN circuit	D16	Serial communication	Except for sleep status
			*1
X mode switch	B14 ↔ Chassis ground	8 V or more → less than 1.5 V	X mode switch ON
TPMS / keyless entry communication circuit	D11	Serial communication	When door lock/unlock is operated with the

			keyless transmitter
Immobilizer antenna (B)	B22	Serial communication	Communication with ignition key in progress
Immobilizer antenna (A)	B10	Serial communication	
Immobilizer antenna amplifier GND	B30 ↔ B2	Less than 1.5 V	Always
Immobilizer antenna amplifier power supply	B2 ↔ B30	4.5 V — 5.5 V	Communication with ignition key in progress
Security UART	A21	Serial communication	Always
Shift lock solenoid	B5 ↔ Chassis ground	Less than 1.0 V → 9 V or more	When shift lock is operating (AT)
Key lock solenoid	B4 ↔ Chassis ground	Less than 1.0 V → 9 V or more	LOCK status is ON (AT model without the keyless access with push button start)
			*2
Rear wiper ON output	A7 ↔ Chassis ground	Less than 1.0 V → 9 V or more	Rear wiper operation in progress
Rear wiper return output	A6 ↔ Chassis ground	Less than 1.0 V → 9 V or more	Wiper reversed operation in progress
Door LOCK output	D2 ↔ Chassis ground	Less than 1.0 V → 9 V or more	When LOCK signal is output
Door UNLOCK output	D3 ↔ Chassis ground	Less than 1.0 V → 9 V or more	When UNLOCK signal is output
Door lock UNLOCK (driver's seat) output	D4 ↔ Chassis ground	Less than 0.5 V → 8 V or more	When driver's side door lock is output
Rear gate/trunk UNLOCK output	D7 ↔ Chassis ground	Less than 1.0 V → 9 V or more	When UNLOCK signal is output
Lighting relay power supply	A3 ↔ Chassis ground	10 — 13 V	ACC or key-in SW ON
Lighting relay power supply (redundant circuit)	B19 ↔ Chassis ground	10 — 13 V	ACC or key-in SW ON
Lighting relay Hi output	A17 ↔ Chassis ground	9 V or more → less than 1.0 V	Dimmer SW at Hi position
Lighting relay Hi (LH) output	C28 ↔ Chassis ground	9 V or more → less than 1.0 V	Dimmer SW at Hi position
Lighting relay Hi (RH) output	C29 ↔ Chassis ground	9 V or more → less than 1.0 V	Dimmer SW at Hi position
Lighting relay Lo output	B35 ↔ Chassis ground	9 V or more → less than 1.0 V	Dimmer SW at Lo position
Lighting Lo relay output	A27 ↔ Chassis ground	9 V or more → less than	Lighting II SW at ON

2		1.0 V	position
Lighting relay I output	A16 ↔ Chassis ground	9 V or more → less than 1.0 V	Lighting I SW at ON position
Front fog light output	A15 ↔ Chassis ground	9 V or more → less than 1.0 V	Front fog light SW at ON position
DRL cancel output	D10 ↔ Chassis ground	8 V or more → less than 1.0 V	Headlight switch ON or Hi beam ON, passing switch ON
North America DRL (dedicated light) output	D10 ↔ Chassis ground	9 V or more → less than 1.0 V	When DRL (dedicated light) is ON
Illumination output	B8	Pulse output	Illumination ON
	C16	Pulse output	Illumination ON
Key ring illumination	A25	Pulse output	Illumination ON
Room light output	C4	Pulse output	Room light ON (doors interlocked)
Map light output	D8	Pulse output	Map light ON (keyless answer-back, etc.)
Luggage/trunk light output	C3	Pulse output	Luggage/trunk at open state
Front wiper return	A2 ↔ Chassis ground	Less than 1.0 V → 9 V or more	When front wiper is reversed
Front wiper Lo output	A8 ↔ Chassis ground	Less than 1.0 V → 9 V or more	Front wiper Lo SW ON
Front wiper Hi output	B27 ↔ Chassis ground	Less than 1.0 V → 9 V or more	Front wiper Hi SW ON
Front wiper Hi output 2	A18 ↔ Chassis ground	Less than 1.0 V → 9 V or more	Front wiper Hi SW ON
Answer-back buzzer output	A20 ↔ Chassis ground	Less than 1.0 V → 9 V or more	When answer-back operates
Rear defogger relay output	A26 ↔ Chassis ground	9 V or more → less than 1.0 V	Rear defogger SW ON
Wiper deicer relay output	D9 ↔ Chassis ground	9 V or more → less than 1.0 V	Wiper deicer SW ON
Hazard input	D30 ↔ Chassis ground	9 V or more → less than 1.0 V	Hazard SW ON
Turn/hazard output	D18 ↔ Chassis ground	9 V or more → less than 1.0 V	When answer-back is output
Security output	A24 ↔ Chassis ground	8 V or more → less than 1.0 V	When signal is output
Security indicator light	D26 ↔ Chassis ground	9 V or more → less than 1.0 V	When security indicator light illuminates
Immobilizer communication	A31	Serial communication	(Except for model with keyless access with

			push button start)
Rear defogger SW	C18 ↔ Chassis ground	Less than 1.5 V → 8 V or more	When the switch is ON
Parking brake SW	C32 ↔ Chassis ground	Less than 1.5 V → 8 V or more	When parking brake is OFF
Impact sensor	A11 ↔ Chassis ground	8 V or more	Apply an impact
Turn signal RH	B9 ↔ Chassis ground	8 V or more → less than 1.5 V	When turn signal switch RH is ON
Turn signal LH	B21 ↔ Chassis ground	8 V or more → less than 1.5 V	When turn signal switch LH is ON
SRF OFF SW input	D14 ↔ Chassis ground	8 V or more → less than 1.5 V	When SRF OFF SW is pressed
SRF relay output (R)	D20 ↔ Chassis ground	Less than 1.5 V → 8 V or more	When SRF RH FOG is operating
SRF relay output (L)	D21 ↔ Chassis ground	Less than 1.5 V → 8 V or more	When SRF LH FOG is operating
Accessory connector	B29 ↔ Chassis ground	8 V or more → less than 1.5 V	Rear gate/trunk closed → open

*1: For CAN sleep state, hold on for approx. one minute with ignition OFF and the doors, trunk, and rear gate all closed.

*2: Use an oscilloscope for measurement due to short output time.

BODY CONTROL(DIAGNOSTICS) > Customize

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Body Control], and then select [Enter].
5. On [Select Function] display, select [Customize].

Note:

- **If not equipped (depending on destination area or vehicle equipment condition), customizing is not possible.**
- **For detailed operation procedures, refer to "Application help".**

List of User Customizing item

Data	Initial setting value	Customize setting	Remarks
Off delay time	30s	OFF	Room light off delay time can be selected.
		10 Sec	
		20 Sec	
		30s	
Auto Light Sensitivity Adjustment	Normal	Dull	Slow response
		Normal	Standard
		Sensitive	Quick response
		Very sensitive	Fairly quick response
Driver's Door Unlock Setting	Selection	ALL	The door to be unlocked when you touch the driver's door can be set.
		Selection	
Rear Gate Unlock Setting	Selection	ALL	The door to be unlocked when you touch the rear gate switch can be set.
		Selection	
One-touch Turn Signal System Setup	ON	ON	Workable when the "Lane change signal setting" is set to "ON". ON/OFF of the one-touch blinker can be set.
		OFF	
Auto Wiper System (Rear) Setup	(*3)	Exist	Workable when the "Rear wiper auto setting" is set to "ON". ON/OFF of the rear wiper linked with reverse operation can be set. *3: Set to "OFF" for U4 and U5. Set to "ON" for C0, C4, and C5.
		Not Exist	
High Beam Assist Current Setting	(*3)	ON	High beam assist is activated.
		OFF	High beam assist is deactivated.
Rr Defogger op. mode (*1)	Normal	Normal	Wiper deicer stops in 15 minutes automatically after switch is turned to ON.
		Continuous	The wiper deicer activates for 15 minutes and turns inactive for 2 minutes repeatedly until

			the switch is turned OFF.
Security Alarm Setup	ON	ON	Security alarm (hazard, horn or siren) is activated.
		OFF	Security alarm is deactivated.
Impact Sensor Setup	OFF	ON	Workable when Impact Sensor Setup is set to "ON". Impact sensor function is activated.
		OFF	Impact sensor function is deactivated. (Be sure to set to {OFF} in models without sensors.)
Alarm delay setup	ON		After the keyless lock operation, the alarm monitor starts after the following delay time has passed.
		ON	Delay time is 30 seconds.
		OFF	Delay time is 0 seconds.
Lockout prevention	ON	ON	Key lockout prevention function is activated. (The function does not operate if safety knob is locked by hand.)
		OFF	Key lockout prevention function is deactivated.
Impact sensor (OP)	Not Exist	Exist	Vehicle is controlled in impact sensor equipped mode. (Make sure to set to OFF for models without the impact sensor. When set to ON, hazard, the horn or siren will operate after doors are locked by the keyless entry system operation (alarm monitor start).)
		Not Exist	Vehicle is controlled in no impact sensor mode.
Answer-back buzzer setup (*2)	ON	ON	When lock/unlock is selected by keyless entry system operated, hazard answer-back buzzer operates.
		OFF	When lock/unlock is selected by keyless entry system operated, hazard answer-back does not operate.
Hazard answer-back setup	ON	ON	Hazard blinks when lock/unlock is selected by keyless entry system operation.
		OFF	Hazard is not interlocked when lock/unlock is selected by keyless entry system operation.
Passive Alarm	OFF	ON	—
		OFF	—
Door open warning	Exist	Exist	If a door stays half shut for 20 minutes, interior lighting linked with the door such as room light, map light, luggage room light, trunk room light and key ring illumination go off to prevent battery run-out.
		Not Exist	Room light, map light, luggage room light, trunk room light, key ring illumination and

			door warning light remain lit.
Dome Light Alarm Setting	OFF	ON	Room light illuminates interlocking with alarm.
		OFF	Room light does not illuminate interlocking with alarm.
Welcome Lighting (Exiting)	30s	OFF	Length of the lighting time can be set.
		30s	
		60 s	
		90 s	
Welcome Light Off Delay Time(Approaching)	30s	OFF	Length of the lighting time can be set.
		30s	
		60 s	
		90 s	
Keyless Buzzer Volume	5	1 through 7	Buzzer volume can be set.

*1: Wiper deicer operates in accordance with rear defogger operations.

*2: Power rear gate operation start buzzer is also linked to this setting. Alert buzzers such as for pinching detection is not included.

*3: Customization item according to the actual vehicle equipment.

6. When the setting is complete, make sure that the alterations by [Data monitor] are consistent with the actual equipment on the vehicle.

Caution:

- **the above settings must match the actual vehicle equipment.**
- **Do not change settings except for setting above while setting the functions.**
- **Be sure not to change Factory initial setting except when installing a new body integrated unit.**

BODY CONTROL(DIAGNOSTICS) > Data Monitor

LIST

Items to be displayed	Unit of measure	Content	Note
BATT voltage (control)	10 – 15 V	Body integrated unit input value	Always
BATT voltage (BACKUP)	10 – 15 V	Body integrated unit input value	Always
IGN voltage	10 – 15 V	Body integrated unit input value	Ignition switch ON
ACC voltage	10 – 15 V	Body integrated unit input value	Ignition switch ACC
Illumination VR Voltage	0 – 5 V	Body integrated unit input value	Input value from illumination volume
Illumination output d-ratio	0 – 100%	Body integrated unit output value	Small light ON Illumination volume is other than bright.
number of regist.	0 – 4	Number of keyless key registered	
Front Wheel Speed	km/h	CAN data input value	Reception from VDC module
Fuel consumption	cc/s	CAN data input value	Reception from ECM
Coolant Temp.	–40 – 215°C	CAN data input value	Reception from ECM
Shift Position	1 – 3, D-S, D, N, R, P	CAN data input value	Reception from TCM
Buzzer beeping request	Status for 'beeping deactivated' Reverse warning Key warning buzzer Light Remained Buzzer Customize 1 Customize 2 Registration completed 1 Registration completed 2 Registered Registration NG	CAN data output value	Reception from body integrated unit
Destination	JPN U4,U5,U6	CAN data input value	—

	C0 EC,EA,E2,EL K4,C4,C6 KS EK ER,EN KA,KC EH C6		
Illumination Sensor Output	0 — 5 V	CAN data input value	—
Off delay time	OFF 10 Sec 20 Sec 30s	Body integrated unit setting value	Customize setting
Auto Light Sensitivity Adjustment	Dull Normal Sensitive Very sensitive	Body integrated unit setting value	Customize setting
Key-lock Warning SW	ON/OFF	Body integrated unit input value	ON when ignition key is inserted (model without keyless access with push button start)
ACC Input	ON/OFF	Body integrated unit input value	ON when ACC switch is ON (model with keyless access with push button start)
Stop Light Switch	ON/OFF	Body integrated unit input value	ON when brake pedal is depressed
Front fog lamp SW input	ON/OFF	Body integrated unit input value	When front fog light switch is ON
Rear fog lamp SW input	ON/OFF	Body integrated unit input value	When rear fog light switch is ON
Driver's door SW input	ON/OFF	Body integrated unit input value	ON when driver's door is open
P-door SW input	ON/OFF	Body integrated unit input value	ON when passenger's door is open
Rear right door SW input	ON/OFF	Body integrated unit input value	On when rear right door is open
Rear left door SW input	ON/OFF	Body integrated unit input value	On when rear left door is open
R Gate SW input	ON/OFF	Body integrated unit input value	ON when rear gate/trunk open
Manual lock SW input	ON/OFF	Body integrated unit input value	Manual lock switch ON

Manual unlock SW input	ON/OFF	Body integrated unit input value	Manual unlock switch ON
Bright SW input	ON/OFF	Body integrated unit input value	Bright switch ON
P SW	ON/OFF	Body integrated unit input value	On when shift range is in parking Shift lever P switch signal
MT Reverse SW	ON/OFF	Body integrated unit input value	Reverse switch ON (for MT vehicle only)
R wiper ON SW input	ON/OFF	Body integrated unit input value	Rear wiper switch ON
R wiper INT SW input	ON/OFF	Body integrated unit input value	Rear wiper switch INT ON
R washer SW input	ON/OFF	Body integrated unit input value	Rear washer switch ON
Rr Defogger SW	ON/OFF	Body integrated unit input value	Rear defogger switch ON
Fr wiper input	ON/OFF	Body integrated unit input value	On when front wiper is operating
Parking Brake Signal	ON/OFF	Body integrated unit input value	Parking brake ON
Driver's seat lock status SW input	ON/OFF	Body integrated unit input value	Displays latch state, ON when locked
Passenger's seat lock status SW input	ON/OFF	Body integrated unit input value	Displays latch state, ON when locked
R gate lock status SW input	ON/OFF	Body integrated unit input value	Displays latch state, ON when locked
R Gate Release SW input	ON/OFF	Body integrated unit input value	Rear gate release switch ON
Rr Defogger output	ON/OFF	Body integrated unit output value	On when rear defogger relay is operating
lock actuator LOCK output	ON/OFF	Body integrated unit output value	ON when lock signal is output
All seat UNLOCK output	ON/OFF	Body integrated unit output value	On when unlock signal is output
D-seat UNLOCK output	ON/OFF	Body integrated unit output value	On when unlock signal is output
R gate/trunk UNLK output	ON/OFF	Body integrated unit output value	ON when rear gate/trunk unlock signal is output
R wiper output	ON/OFF	Body integrated unit output value	ON when rear wiper motor is operating
Shift Lock Solenoid	ON/OFF	Body integrated unit output value	On when shift lock solenoid is operating (only AT model)

Key lock solenoid output	lock/unlock	Body integrated unit output value	LOCK when the key is locked
wiper deicer output	ON/OFF	Body integrated unit output value	ON when wiper deicer relay is operating
Hazard Output	ON/OFF	Body integrated unit output value	ON when answer-back signal is received or when hazard is operating
Keyless Buzzer Output	ON/OFF	Body integrated unit output value	ON when lock/unlock signal is received
Horn Output	ON/OFF	Body integrated unit output value	On when security warning is operating
Illumination lamp O/P	ON/OFF	Body integrated unit output value	On when illumination is illuminated
Room lamp output	ON/OFF	Body integrated unit output value	ON when keyless lock/unlock signal is received, or when opening or closing the door
key illumination lamp o/p	ON/OFF	Body integrated unit output value	On when key illumination light is illuminated
R fog lamp output	ON/OFF	Body integrated unit output value	ON when rear fog light is ON
Immobilizer lamp output	ON/OFF	Body integrated unit output value	ON when security indicator light blinks
Keyless operation 1	Registration/Normal	Body integrated unit input value	When keyless registration connector is connected
Keyless operation 2	Clear/Normal	Body integrated unit input value	When keyless registration is deleted
Small Light SW	ON/OFF	Body integrated unit input value	On when small light is illuminated
Headlamp	ON/OFF	Body integrated unit input value	ON when headlight Lo is illuminated
High Beam	ON/OFF	Body integrated unit input value	ON when headlight Hi is illuminated
Blower fan information	ON/OFF	CAN data input value	Reception from ECM
Heater cock valve output	ON/OFF	Body integrated unit output value	ON when heater cock valve output is detected
Power rear gate setting	Exists/None	Body integrated unit setting value	Customize setting
Lane change signal setting	Exists/None	Body integrated unit setting value	Customize setting
Rear wiper auto setting	Exists/None	Body integrated unit setting value	Customize setting
Xmode SW setting	Exists/None	Body integrated unit setting value	Customize setting

Left turn signal input	ON/OFF	Body integrated unit input value	ON when turn signal switch is ON
Right turn signal input	ON/OFF	Body integrated unit input value	ON when turn signal switch is ON
Left turn signal output	ON/OFF	Body integrated unit output value	ON When turn signal is output
Right turn signal output	ON/OFF	Body integrated unit output value	ON When turn signal is output
XmodeSW input	ON/OFF	Body integrated unit input value	ON when X mode switch is ON
XmodeSW output	ON/OFF	Body integrated unit output value	ON when X mode switch is ON
TPMS Setting	TPMS / No TPMS	Body integrated unit setting value	Customize item
Driver's Door Unlock Setting	Selection / ALL	Body integrated unit setting value	Customize item
Rear Gate Unlock Setting	Selection / ALL	Body integrated unit setting value	Customize item
One-touch Turn Signal System Setup	ON/OFF	Body integrated unit setting value	Customize item
Auto Wiper System (Rear) Setup	ON/OFF	Body integrated unit setting value	Customize item
Daytime Running Light(DRL) Setting for North America	High Beam Dimming System / Alternate DRL System	Body integrated unit setting value	Customize item
Daytime Running Light(Alternate System) Output	ON/OFF	Body integrated unit output value	ON when DRL (dedicated light) illuminates
Steering Responsive Fog Lamp Setting	Exists/None	Body integrated unit setting value	Customize item
Steering Responsive Fog Lamp OFF SW Input	ON/OFF	Body integrated unit setting value	ON when SRF OFF switch is ON
Steering Angle Sensor	-3276.8 – 3276.8 deg	CAN data input value	Received from the VDC CM
Steering Responsive Fog Lamp Mode	OFF / ON / Fail	SRF status	OFF in SRF OFF mode ON in SRF ON mode Fail at the time of SRF failure
Steering Responsive Fog Lamp (Right) Output	ON/OFF	Body integrated unit output value	ON When SRF (R) illumination is ON
Steering Responsive	ON/OFF	Body integrated unit	ON When SRF (L) illumination is

Fog Lamp (Left) Output		output value	ON
Steering Responsive Fog Lamp (Right) CAN Output	ON/OFF	CAN data output value	ON When SRF (R) illumination is ON
Steering Responsive Fog Lamp (Left) CAN Output	ON/OFF	CAN data output value	ON When SRF (L) illumination is ON
Steering Responsive Fog Lamp Indicator Signal	Turn_OFF / Turn_ON / BLINK	CAN data output value	Lights off in SRF ON mode Lights on in SRF OFF mode Blinks at the time of SRF failure
Head Lamp Low Beam Specification	Halogen / HID / LED	Body integrated unit setting value	Customize setting Note: It is set to Halogen even on the LED type.
Head Lamp High Beam Specification	Halogen / HID / LED	Body integrated unit setting value	Customize setting Note: It is set to Halogen even on the LED type.
High Beam Assist Current Setting	ON/OFF	Body integrated unit setting value	Customize setting
High Beam Assist Active Indicator	Turn_OFF / Turn_ON	CAN data output value	Lights on when HBA is activated
High Beam Assist Failure Indicator	Turn_OFF / Turn_ON	CAN data output value	Fixed to Light off
High Beam Assist Failure Message	No message / HALT / Fail	CAN data output value	Fixed to Hide
High Beam Assist Function Setting (EyeSight System)	Exists/None	Body integrated unit setting value	Customize setting
High Beam Assist Indicator (Blink)	Turn_OFF / BLINK	CAN data output value	Blinking when HBA is activated
Lighting I Switch Input	ON/OFF	Body integrated unit input value	Small light switch ON
Lighting II Switch Input	ON/OFF	Body integrated unit input value	Headlight switch ON
Lighting AUTO input	ON/OFF	Body integrated unit input value	Headlight AUTO switch ON
Dimmer Hi Switch Input	ON/OFF	Body integrated unit input value	Headlight Hi switch ON
Dimmer Pass Switch Input	ON/OFF	Body integrated unit input value	Dimmer Pass switch ON
Illumination sensor flag	ON/OFF	Body integrated unit setting value	Shows the existence of illumination sensor

Lighting I Lamp Output	ON/OFF	Relay drive	On when small light is illuminated
Lighting II Lamp Output	ON/OFF	Relay drive	ON when headlight is illuminated
Lighting Hi Lamp Output	ON/OFF	Relay drive	ON when headlight Hi is illuminated
Front Fog Lamp Output	ON/OFF	Relay drive	When front fog light relay ON output
DRL Cancel Output	ON/OFF	Relay drive	When DRL cancel relay ON output
Front wiper AUTO switch input	ON/OFF	Body integrated unit input value	When F wiper Auto SW is ON
Front wiper Low switch input	ON/OFF	Body integrated unit input value	Front wiper Lo switch ON
Front wiper High switch input	ON/OFF	Body integrated unit input value	Front wiper Hi switch ON
Front washer switch input	ON/OFF	Body integrated unit input value	Front wiper washer switch ON
Front wiper Low output	ON/OFF	Body integrated unit output value	ON when front wiper Lo is operating
Front wiper High output	ON/OFF	Body integrated unit output value	ON when front wiper Hi is operating
Rr Defogger op. mode	Continuous/Normal	Body integrated unit setting value	Customize setting
Security Alarm Setup	ON/OFF	Body integrated unit setting value	Customize setting
Impact Sensor Setup	ON/OFF	Body integrated unit setting value	Customize setting
Alarm delay setup	ON/OFF	Body integrated unit setting value	Customize setting
Lockout prevention	ON/OFF	Body integrated unit setting value	Customize setting
Impact sensor	Exists/None	Body integrated unit setting value	Customize setting
Answer-back buzzer setup	ON/OFF	Body integrated unit setting value	Customize setting
Hazard answer-back setup	ON/OFF	Body integrated unit setting value	Customize setting
Answer-back Buzzer	Exists/None	Body integrated unit setting value	Customize setting
Automatic lock YES/NO	Exists/None	Body integrated unit setting value	Customize setting

Passive Alarm	ON/OFF	Body integrated unit setting value	Customize setting
Door open warning	Exists/None	Body integrated unit setting value	Customize setting
Dome Light Alarm Setting	ON/OFF	Body integrated unit setting value	Customize setting
Auto A/C Setting	Exists/None	Body integrated unit setting value	Customize setting
wiperdeicer	Exists/None	Body integrated unit setting value	Customize setting
Illumination Control On/Off	Exists/None	Body integrated unit setting value	Customize setting
Sedan/Wagon Setting	Sedan/wagon	Body integrated unit setting value	Customize setting
MT/AT Setting	MT / AT	Body integrated unit setting value	Customize setting
Destination Setting	JPN KA,KC KS EU LHD Other than KS C0,C5 U4,U5,U6,C6 EK,ER	Body integrated unit setting value	Customize setting
Seat Memory Setting	Exists/None	Body integrated unit setting value	Customize setting
Illumination Sensor Setting	Exists/None	Body integrated unit setting value	Customize setting
Factory initial setting	Market/Factory	Body integrated unit setting value	Customize setting
Outside temperature sensor failure	Abnormal/Normal	Body integrated unit input value	Error when there is a failure in the ambient sensor
Auto Wiper/INT Setting	AUTO / INTO	Body integrated unit setting value	Customize setting
Welcome Lighting (Exiting)	OFF / 30 seconds / 60 seconds / 90 seconds	Body integrated unit setting value	Customize setting
Welcome Light Off Delay Time(Approaching)	OFF / 30 seconds / 60 seconds / 90 seconds	Body integrated unit setting value	Customize setting
Keyless Buzzer Volume	1 — 7	Body integrated unit setting value	Customize setting

BODY CONTROL(DIAGNOSTICS) > Data Monitor

OPERATION

- 1.** On [Start] display, select [Diagnosis].
- 2.** On [Vehicle selection] display, input the target vehicle information and select [OK].
- 3.** On [Main Menu] display, select [Each System].
- 4.** On [Select System] display, select [Body Control], and then select [Enter].
- 5.** On [Select Function] display, select [Data monitor].

Note:

For detailed operation procedures, refer to “Application help”.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1010 BODY CONTROL SYSTEM (BIU) MALFUNCTION

DTC detecting condition:

System error in body integrated unit

Trouble symptom:

LAN communication immobilizer function may not be executed normally.

1. CHECK DTC.

Check DTC indicated by body integrated unit. [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1010 a current malfunction?

Yes

[Go to 2.](#)

No

Temporary EEPROM access error occurred.

2. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector.
3. Connect the disconnected connectors.
4. Read the DTC of body integrated unit using Subaru Select Monitor. [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1010 displayed? (Current malfunction)

Yes

Replace the body integrated unit. [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

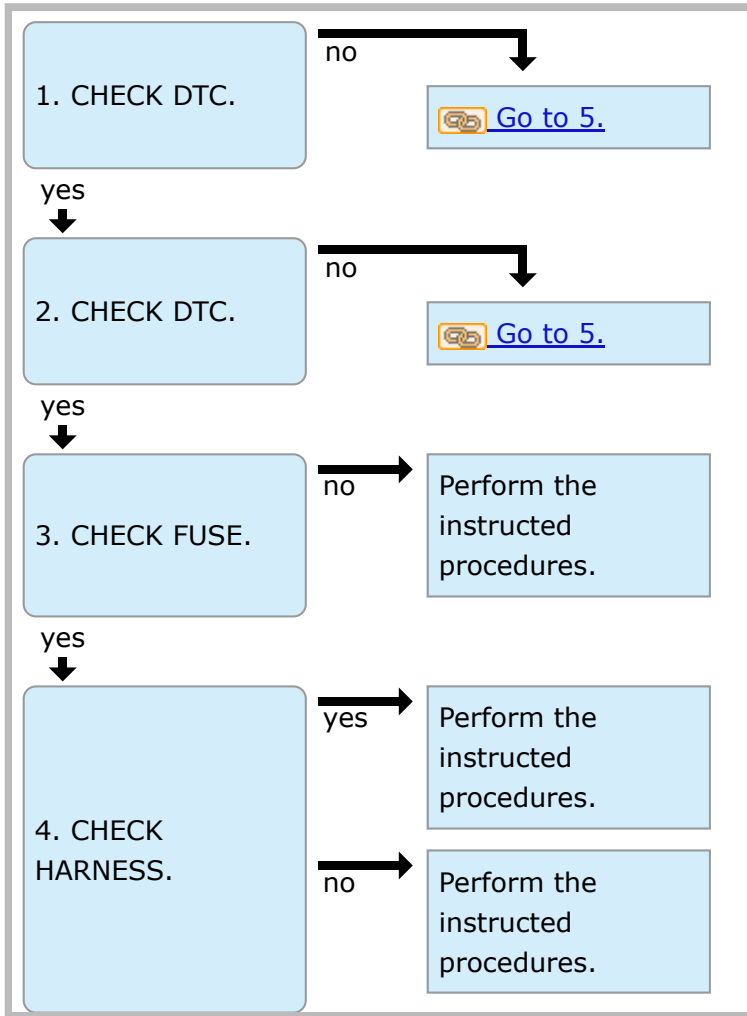
No

Temporary EEPROM access error occurred.

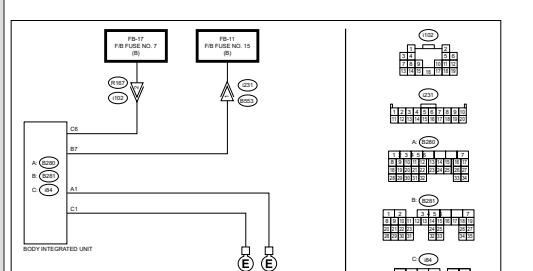
BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1011 BATTERY CONTROL POWER SUPPLY

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Immobilizer system [Ref. to WIRING SYSTEM>Immobilizer System>WIRING DIAG](#)



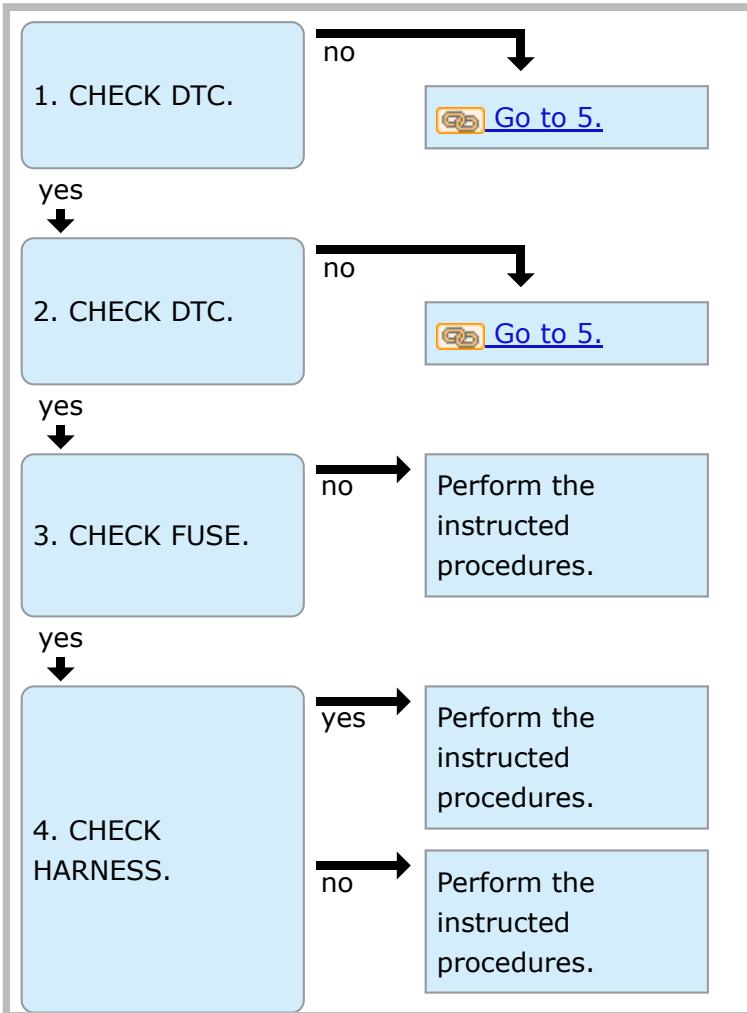
Note:
When [DTC B1012 BATTERY BACKUP SUPPLY] is output at the same time of body integrated unit may not op

START

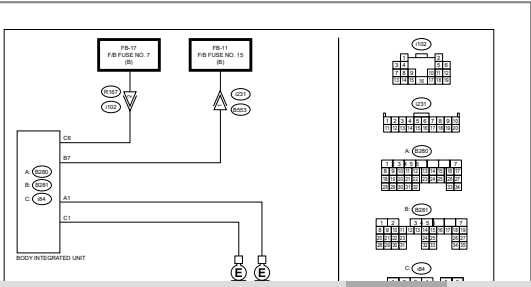
BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1012 BATTERY BACKUP POWER SUPPLY

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Immobilizer system [Ref. to WIRING SYSTEM>Immobilizer System>WIRING DIAG](#)



Note:
 When [DTC B1011 BATTERY CONTROL SUPPLY] is output at the same time of body integrated unit may not operate.

START

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1013 IGNITION POWER

DTC detecting condition:

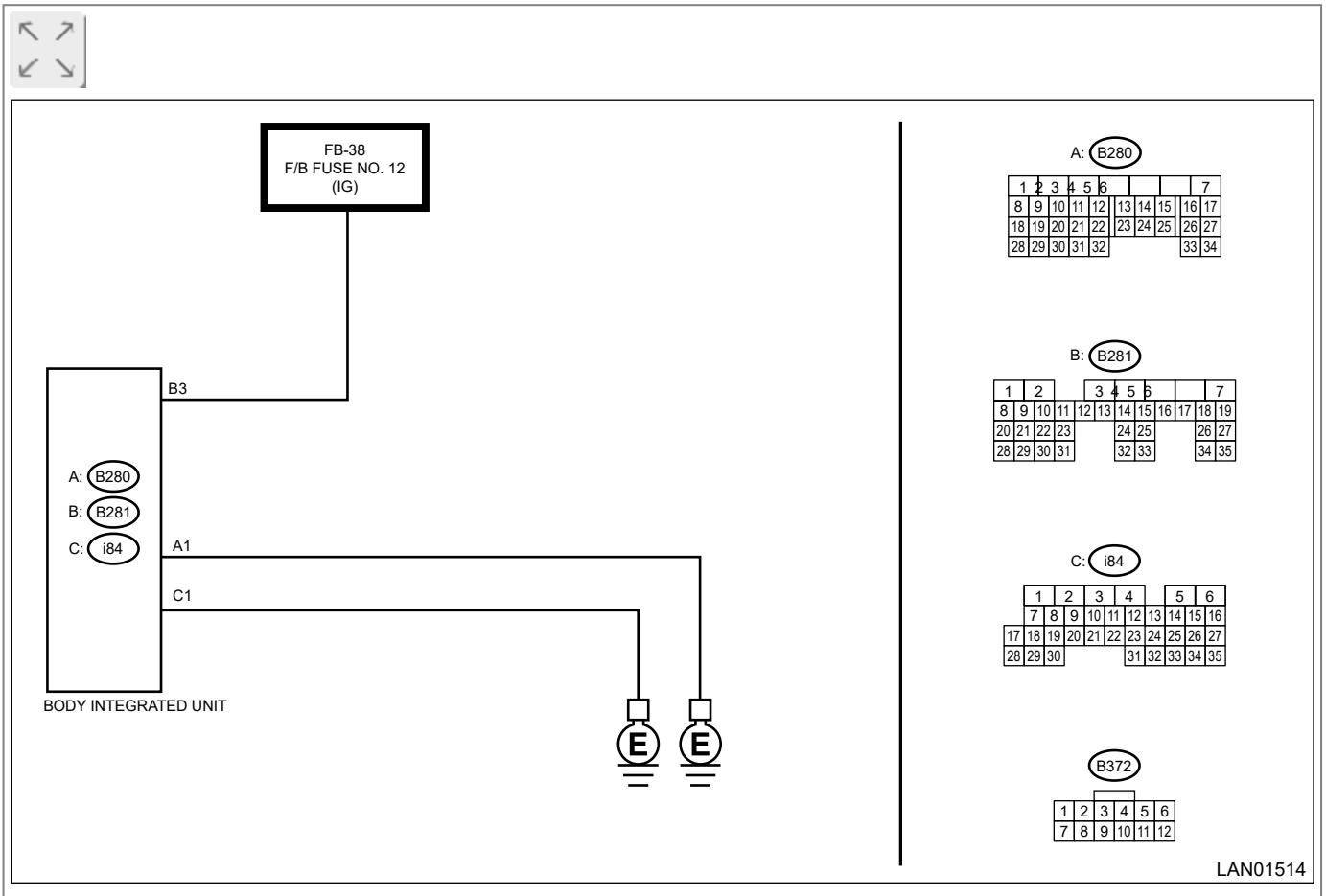
Voltage failure caused by poor contact of IGN power supply circuits

Trouble symptom:

Symptoms such as shift lock or wiper not operating may occur.

Wiring diagram:


Shift lock control system  [Ref. to WIRING SYSTEM>Shift Lock Control System>WIRING DIAGRAM.](#)



LAN01514

1. CHECK DTC.



Read the DTC of body integrated unit using Subaru Select Monitor.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1013 displayed? (Current malfunction)

Yes

 [Go to 2.](#)

No

 [Go to 5.](#)

2. CHECK DTC.



1. Turn the ignition switch to OFF.
2. Disconnect and then connect the body integrated unit connector.
3. Wait approx. 2 minutes.
4. Turn the ignition switch to ON.
5. Read the DTC of body integrated unit using Subaru Select Monitor. [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1013 displayed? (Current malfunction)

Yes

[Go to 3.](#)

No

[Go to 5.](#)

3. CHECK FUSE.



1. Turn the ignition switch to OFF.
2. Check the fuse.

Is the check result OK?

Yes

[Go to 4.](#)

No

Replace the defective fuse.

4. CHECK HARNESS.



1. Disconnect the body integrated unit connector.
2. Using the tester, measure the voltage between terminals.

Connector & terminal

(B281) No. 3 (+) — Chassis ground (-):

Is the voltage 8.5 — 16.5 V?

Yes

Replace the body integrated unit. [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

No

Repair the harness between body integrated unit and fuse.

5. CHECK CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector.
3. Check for poor contact of connector.

Is the check result OK?

Yes

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

Repair or replace the poor contact of connector.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1014 ACC POWER

DTC detecting condition:

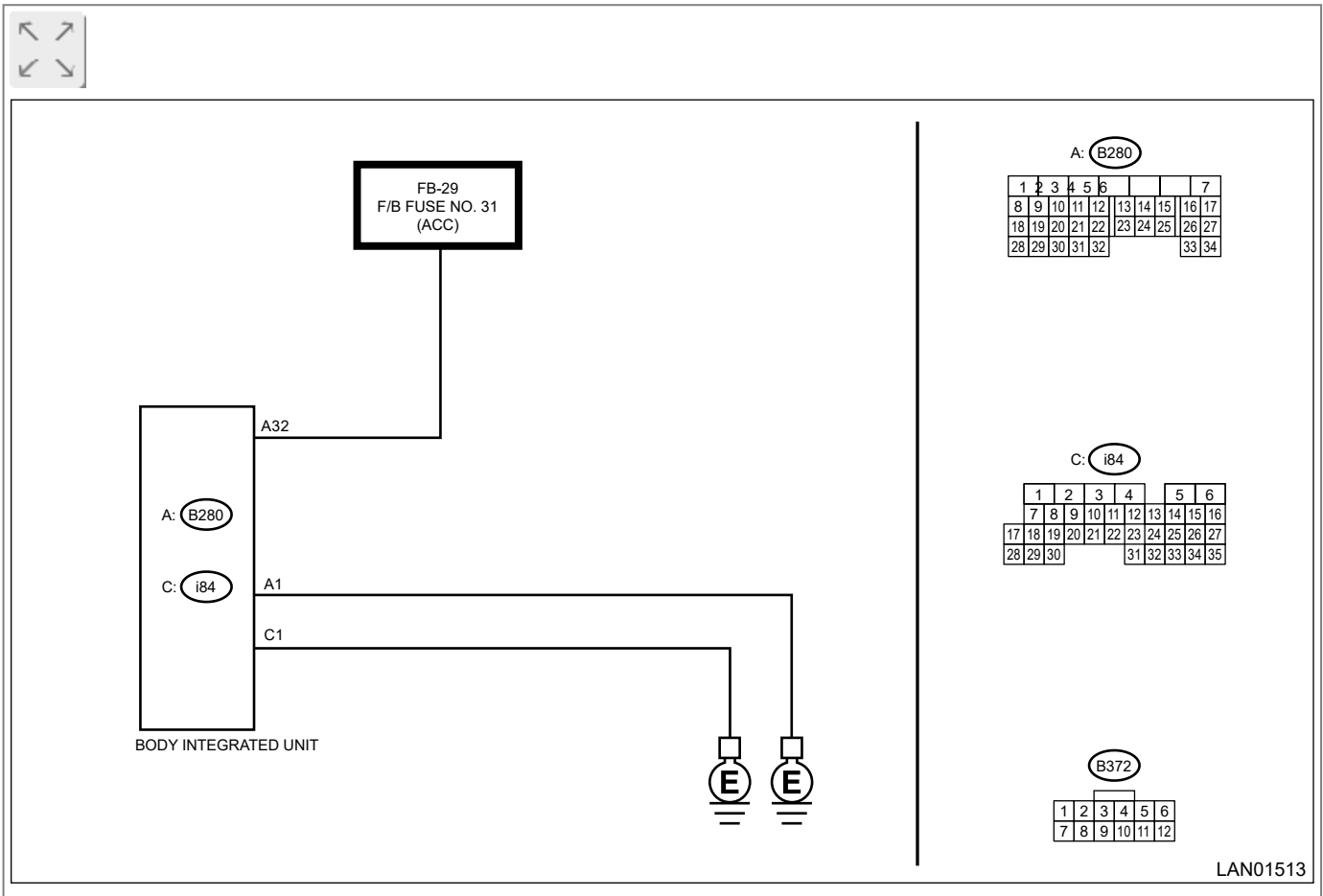
Voltage failure caused by poor contact of ACC power supply circuit

Trouble symptom:

DRL may not illuminate.


Wiring diagram:

Shift lock control system  [Ref. to WIRING SYSTEM>Shift Lock Control System>WIRING DIAGRAM.](#)




1. CHECK DTC.



Read the DTC of body integrated unit using Subaru Select Monitor.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1014 displayed? (Current malfunction)

Yes


 [Go to 2.](#)

No

 [Go to 5.](#)

2. CHECK DTC.



1. Turn the ignition switch to OFF.
2. Disconnect and then connect the body integrated unit connector.
3. Wait approx. 2 minutes.
4. Turn the ignition switch to ON.
5. Read the DTC of body integrated unit using Subaru Select Monitor.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1014 displayed? (Current malfunction)

Yes

 [Go to 3.](#)

No

 [Go to 5.](#)

3. CHECK FUSE.



1. Turn the ignition switch to OFF.
2. Check the fuse.

Is the check result OK?

Yes

 [Go to 4.](#)

No

Replace the defective fuse.

4. CHECK HARNESS.



1. Disconnect the body integrated unit connector.
2. Using the tester, measure the voltage between terminals.

Connector & terminal

(B280) No. 32 (+) — Chassis ground (—):

Is the voltage 8.5 — 16.5 V?

Yes

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

No

Repair the harness between body integrated unit and fuse.

5. CHECK CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector.
3. Check for poor contact of connector.

Is the check result OK?

Yes

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

Repair or replace the poor contact of connector.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1015 KEY INTERLOCK CIRCUIT

DTC detecting condition:

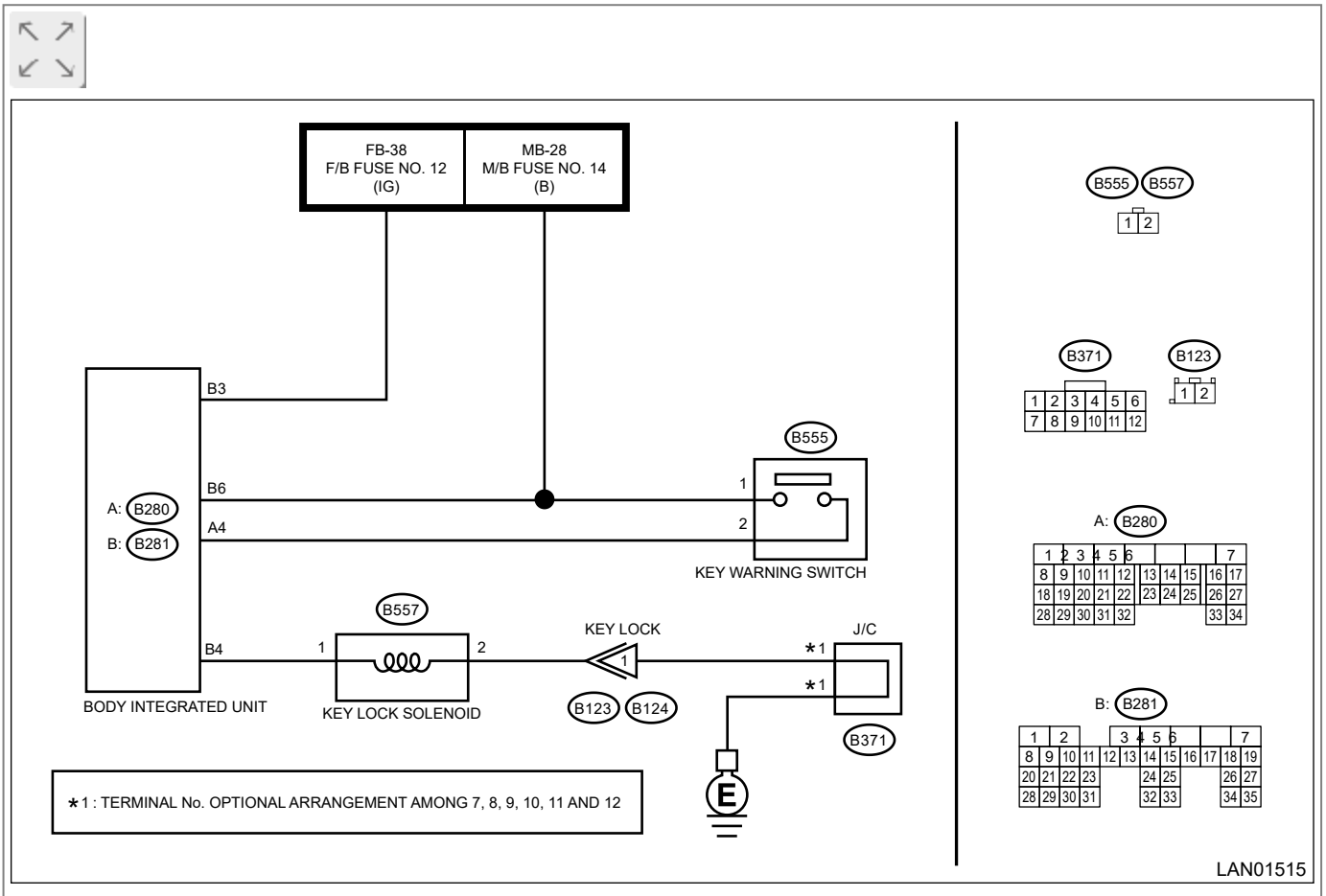
Ground short of key interlock circuit

Trouble symptom:


Key interlock does not keep lock condition.

Wiring diagram:

Shift lock control system  [Ref. to WIRING SYSTEM>Shift Lock Control System>WIRING DIAGRAM.](#)




1. CHECK DTC.

1. Insert the ignition key.
2. Turn the ignition switch to ON.
3. Shift to the Neutral range.
4. Shift into P range.
5. Shift to the Neutral range.
6. Shift into P range.
7. Shift to the Neutral range.
8. Read the DTC of body integrated unit using Subaru Select Monitor.  [Ref. to BODY](#)


[CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1015 displayed? (Current malfunction)


Yes

 [Go to 2.](#)

No

 [Go to 8.](#)

2. CHECK DTC.

1. Shift the select lever to P range.
2. Remove the ignition key.
3. Disconnect the key actuator connector (B557) and body integrated unit connector (B281).
4. Connect the disconnected connectors.
5. Insert the ignition key.
6. Turn the ignition switch to ON and shift into Neutral.
7. Read the DTC of body integrated unit using Subaru Select Monitor.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1015 displayed? (Current malfunction)

Yes

 [Go to 3.](#)

No

 [Go to 8.](#)

3. CHECK KEY ACTUATOR.

1. Turn the ignition switch to OFF.
2. Disconnect the key actuator connector (B557).
3. Measure the resistance between key actuator connectors.

Terminals


No. 1 —No. 2:

Is the resistance 103 — 115 Ω ?

Yes

 [Go to 4.](#)

No

Replace the key actuator.  [Ref. to SECURITY AND LOCKS>Key Lock Cylinders.](#)

4. CHECK KEY ACTUATOR.



Connect the battery terminals to the key actuator.

Terminals

No. 2 — Positive terminal:


No. 1 — Ground terminal:

Is the actuator activated and then key locked?

Yes

 [Go to 5.](#)

No

Replace the key actuator.  [Ref. to SECURITY AND LOCKS>Key Lock Cylinders.](#)

5. CHECK HARNESS (OPEN CIRCUIT).




1. Disconnect the body integrated unit connector (B281).
2. Measure the resistance between body integrated unit and key actuator using tester.

Connector & terminal

(B557) No. 1 — (B281) No. 4:

Is the resistance less than 10 Ω ?

Yes

 [Go to 6.](#)

No

Repair or replace the open circuit of harness.

6. CHECK HARNESS (GROUND SHORT CIRCUIT).



Measure the resistance between body integrated unit and chassis ground using tester.

Connector & terminal

(B281) No. 4 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 7.](#)

No

Repair or replace the short circuit of the harness.

7. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).



1. Connect the body integrated unit.
2. Turn the ignition switch to ON.
3. Measure the voltage between body integrated unit and chassis ground using tester.

Connector & terminal

(B281) No. 4 (+) — Chassis ground (-):

Is the voltage 6 V or more?

Yes

Repair or replace the short circuit of the harness.

No

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

8. CHECK CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector (B281) and key actuator connector (B557).
3. Check for poor contact of connector.

Is the check result OK?

Yes

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

Repair or replace the poor contact of connector.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1016 SHIFT LOCK CIRCUIT

DTC detecting condition:

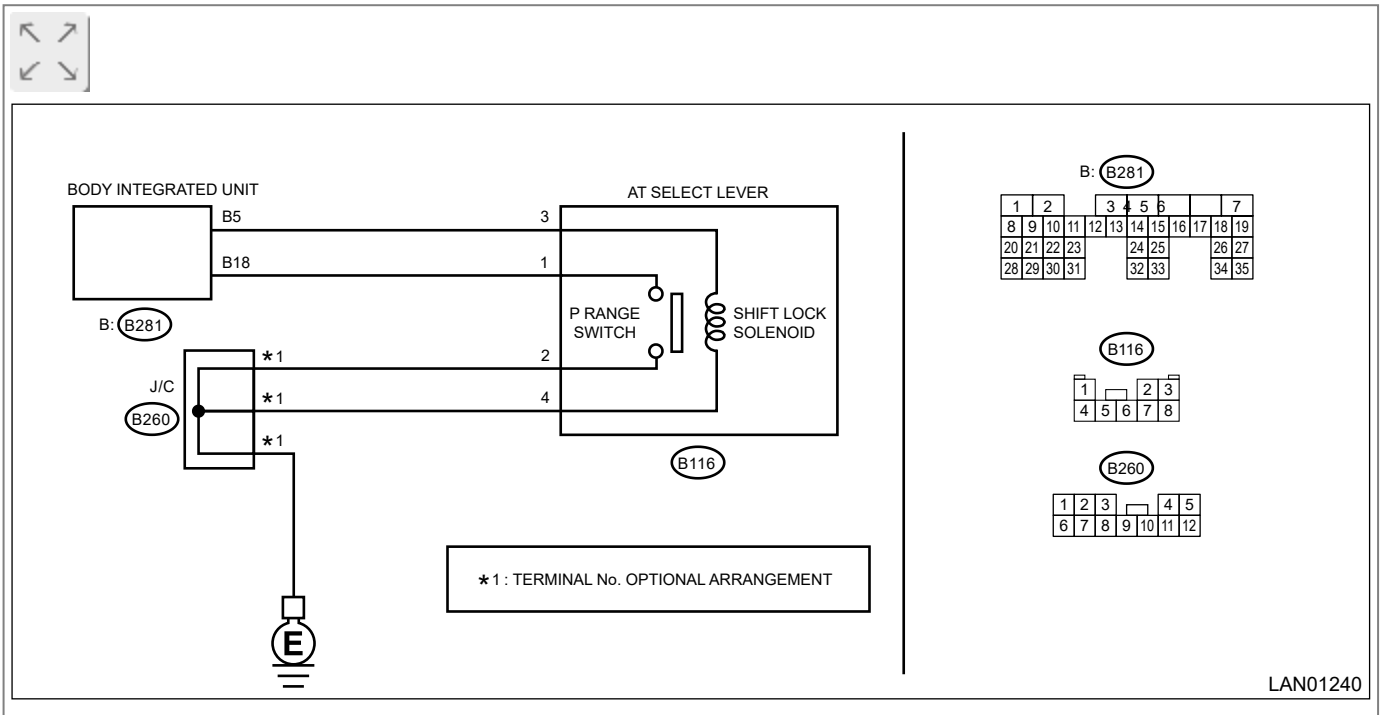
Open or power supply-output short, GND-output short in shift lock circuit.

Trouble symptom:


Shift lock does not be released or remain locked.

Wiring diagram:



Shift lock control system  [Ref. to WIRING SYSTEM>Shift Lock Control System>WIRING DIAGRAM.](#)




1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Keep the Parking range for approx. 5 seconds.
3. Read the DTC of body integrated unit using Subaru Select Monitor.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1016 displayed? (Current malfunction)


 [Go to 6.](#)
  [Go to 2.](#)

2. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the shift lock solenoid connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON, then keep the Parking range for approx. 5 seconds.
5. Read the DTC of body integrated unit using Subaru Select Monitor.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1016 displayed? (Current malfunction)

Yes

 [Go to 3.](#)

No

 [Go to 7.](#)

3. CHECK HARNESS (OPEN CIRCUIT).


1. Turn the ignition switch to OFF.
2. Disconnect the shift lock solenoid connector.
3. Using the tester, measure the resistance between terminals.

Connector & terminal

(B116) No. 4 — Chassis ground:

Is the resistance less than 10 Ω ?

Yes

 [Go to 4.](#)

No

Repair or replace the open circuit of harness.

4. CHECK SHIFT LOCK SOLENOID.

Using a tester, measure the resistance between shift lock solenoid terminals.

Terminals


No. 4 — No. 3:

Is the resistance less than 27 — 31 Ω ?

Yes

 [Go to 5.](#)

No

Replace the shift lock solenoid.  [Ref. to CONTROL SYSTEMS>AT Shift Lock Solenoid and "P" Range Switch>REMOVAL.](#)

5. CHECK SHIFT LOCK SOLENOID.

Connect the battery terminal to shift lock solenoid.

Terminals

No. 3 — Positive terminal:


No. 4 — Ground terminal:

Does the shift lock solenoid operate and then release the lock?

Yes

 [Go to 6.](#)

No

Replace the shift lock solenoid.  [Ref. to CONTROL SYSTEMS>AT Shift Lock Solenoid and "P" Range Switch>REMOVAL.](#)

6. CHECK HARNESS (OPEN CIRCUIT).

Use a tester to measure the resistance between harness terminals.

Connector & terminal

(B116) No. 3 — (B281) No. 5:

Note:

If body integrated unit and shift lock connector are not disconnected, disconnect them first and then perform measurement.

Is the resistance less than 10 Ω ?


Yes

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

No

Repair or replace the open circuit of harness.

7. CHECK DTC.

1. Depress the brake pedal at the parking range.
2. Read the DTC of body integrated unit using Subaru Select Monitor.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1016 displayed? (Current malfunction)

Yes


 [Go to 8.](#)

No

 [Go to 9.](#)

8. CHECK DTC.



1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector and shift lock connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Depress the brake pedal at the parking range.
6. Read the DTC of body integrated unit using Subaru Select Monitor.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1016 displayed? (Current malfunction)

Yes

 [Go to 4.](#)

No

 [Go to 9.](#)

9. CHECK CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector and shift lock connector.
3. Check for poor contact of connector.

Is the check result OK?

Yes

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:


In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

Repair or replace the poor contact of connector.


BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1401 METER COLLATION

For detailed diagnosis procedure, refer to IMMOBILIZER (DIAG).  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1401 METER COLLATION.](#)


BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1402 IMMOBILIZER KEY COLLATION

For detailed diagnosis procedure, refer to IMMOBILIZER (DIAG).  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1402 IMMOBILIZER KEY COLLATION.](#)


BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1405 SCU COLLATION

For detailed diagnosis procedure, refer to IMMOBILIZER (DIAG).  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1405 SCU COLLATION.](#)


BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1406 SCU_EEPROM

For detailed diagnosis procedure, refer to IMMOBILIZER (DIAG).  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1406 SCU EEPROM.](#)


BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1407 MET COMMUNICATION

For detailed diagnosis procedure, refer to IMMOBILIZER (DIAG).  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1407 MET COMMUNICATION.](#)


BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1408 METER NON-VOLATILE MEMORY

For detailed diagnosis procedure, refer to IMMOBILIZER (DIAG).  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1408 METER NON-VOLATILE MEMORY.](#)


BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1409 SCU COMMUNICATION

For detailed diagnosis procedure, refer to IMMOBILIZER (DIAG).  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1409 SCU COMMUNICATION.](#)


BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1410 TRANSPONDER COMMUNICATION

For detailed diagnosis procedure, refer to IMMOBILIZER (DIAG).  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1410 TRANSPONDER COMMUNICATION.](#)

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1411 IMMOBILIZER ANTENNA


For detailed diagnosis procedure, refer to IMMOBILIZER (DIAG).  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1411 IMMOBILIZER ANTENNA.](#)

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

Detected when malfunction occurs in CAN line. (Bus off)

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

No data is received from ECM.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM

No data is received from TCM.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

No data is received from VDC CM.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

No data is received from combination meter.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0164 LOST COMMUNICATION WITH HVAC CONTROL MODULE

No data is received from A/C CM.

Note:

Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0208 LOST COMMUNICATION WITH SEAT MEMORY

DTC detecting condition:

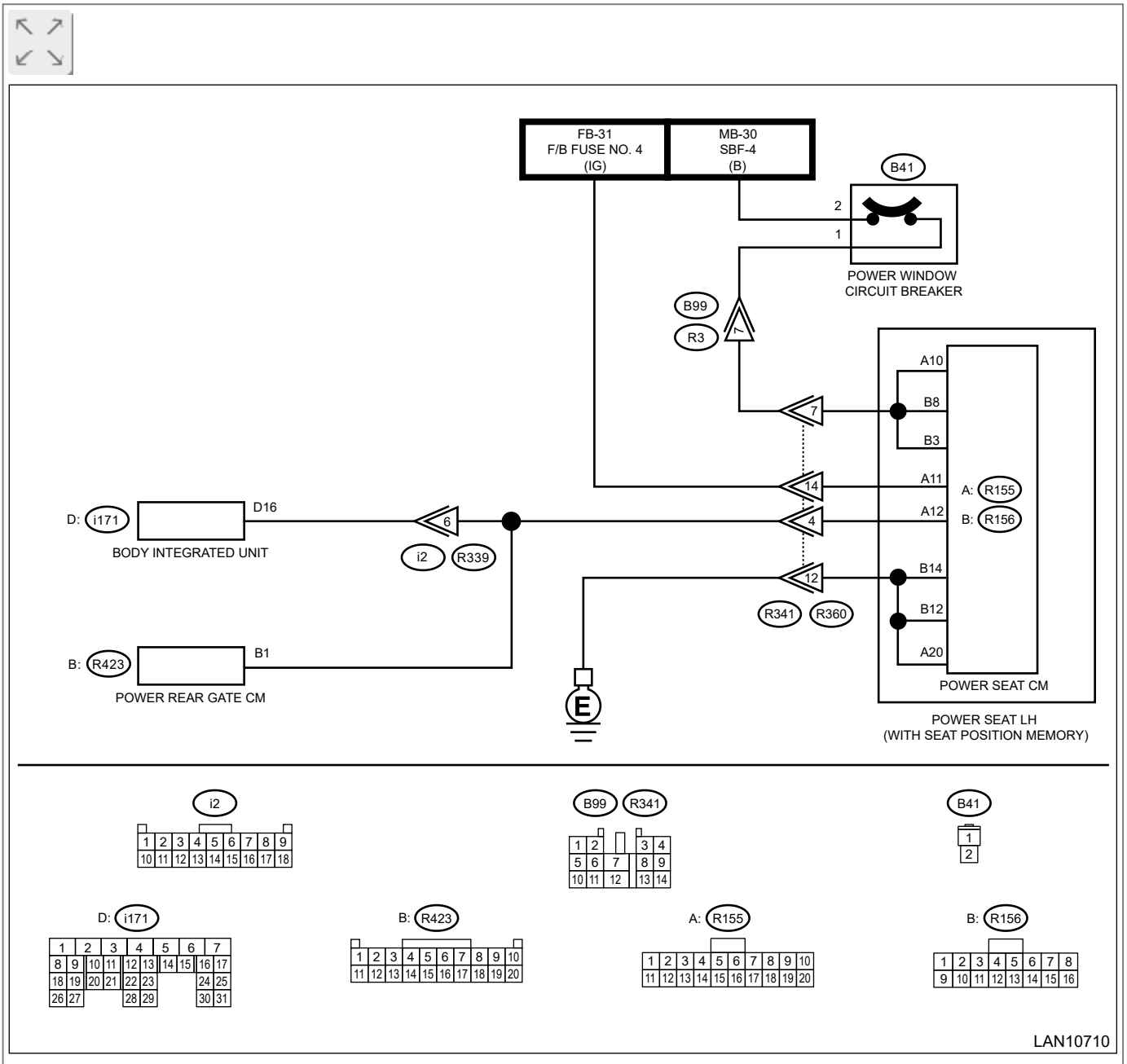
No data is received from power seat CM.

Trouble symptom:

The power seat does not operate normally.


Wiring diagram:

Power seat system  Ref. to WIRING SYSTEM>Power Seat System>WIRING DIAGRAM.




1. CHECK DTC.



Read the DTC of body integrated unit using Subaru Select Monitor.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U0208 displayed? (Current malfunction)

Yes

 [Go to 2.](#)


No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the power seat CM connector and the body integrated unit connector.
3. Connect the disconnected connectors.
4. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U0208 displayed? (Current malfunction)

Yes

 [Go to 3.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the power seat CM connector and the body integrated unit connector.
3. Using the tester, measure the resistance between terminals.

Connector & terminal

(R155) No. 12 — (i171) No. 6:

(R156) No. 12 — Chassis ground:

(R156) No. 14 — Chassis ground:

(R156) No. 20 — Chassis ground:

Is the resistance less than 10 Ω ?

Yes

 [Go to 4.](#)

No

Repair the open circuit of harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).



1. Disconnect the power rear gate CM connector. (With power rear gate)
2. Using the tester, measure the resistance between terminals.

Connector & terminal

(R155) No. 12 — Chassis ground:

Is the resistance 10 k Ω or more?

Yes

 [Go to 5.](#)

No

Repair the shorted portion of harness.

5. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).




1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between terminals.

Connector & terminal

(R155) No. 12 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes

 [Go to 6.](#)

No

Repair the shorted portion of harness.

6. CHECK HARNESS (POWER SUPPLY CIRCUIT).



1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between terminals.

Connector & terminal

(R155) No. 10 (+) — Chassis ground (-):


(R155) No. 11 (+) — Chassis ground (-):

(R156) No. 3 (+) — Chassis ground (-):

(R156) No. 8 (+) — Chassis ground (-):

Is the voltage 9 V or more?



Yes

 [Go to 7.](#)

No


Repair the open circuit of harness.

7. CHECK CONTROL MODULE.


1. Turn the ignition switch to OFF.
2. Replace the power seat CM with a properly functioning part.  [Ref. to SEATS>Power Seat System.](#)
3. Read the DTC of body integrated unit using Subaru Select Monitor.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U0208 displayed? (Current malfunction)


Yes

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

No

For models without power rear gate, malfunction occurred in the power seat CM. For vehicles with power rear gate,  [Go to 8.](#)

8. CHECK CONTROL MODULE.

1. Connect the power rear gate CM connector.
2. Read the DTC of body integrated unit using Subaru Select Monitor.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U0208 displayed? (Current malfunction)

Yes

Replace the power rear gate CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No

Malfunction occurred in the power seat CM.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0230 LOST COMMUNICATION WITH POWER REAR GATE CONTROL MODULE

DTC detecting condition:

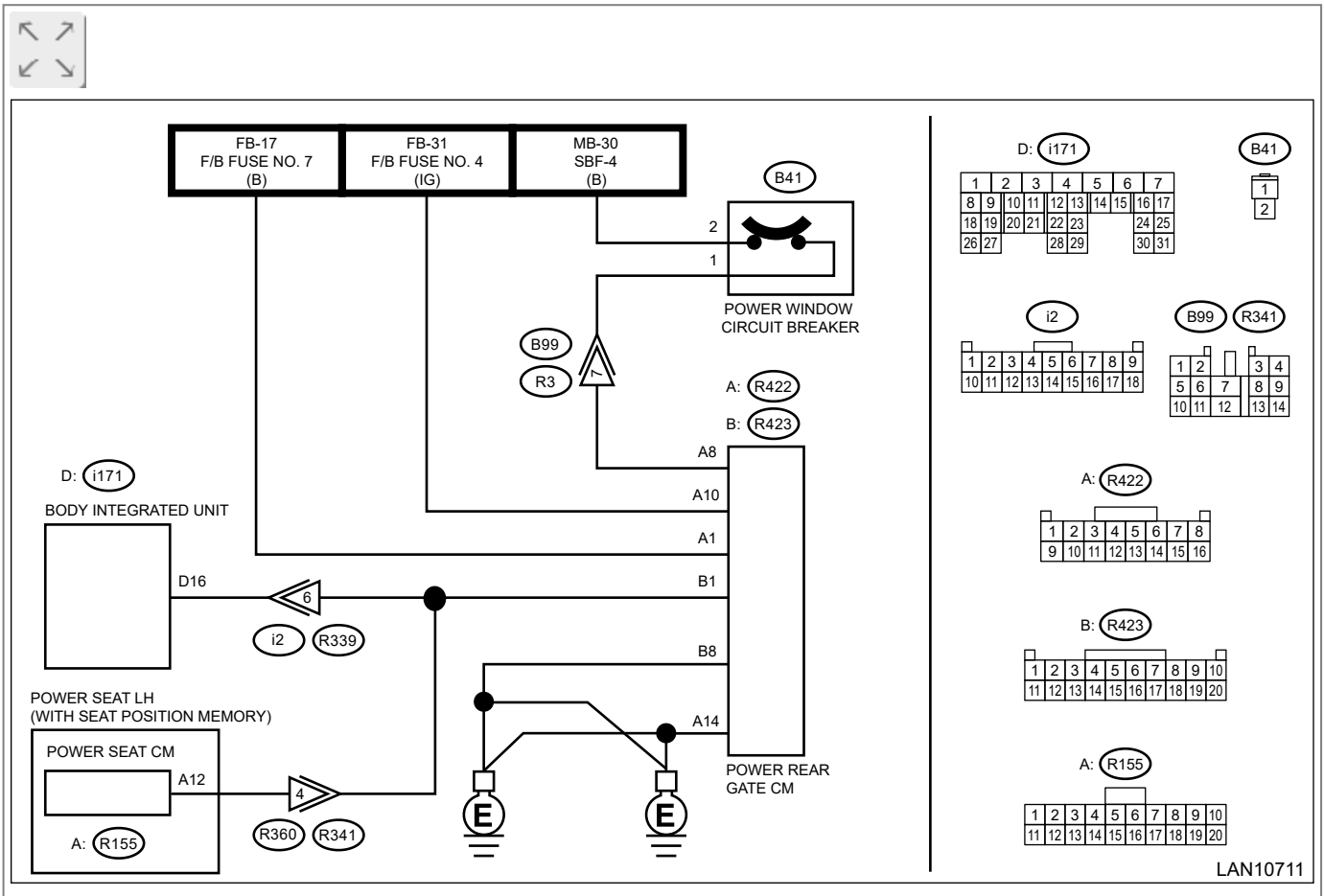
No data is received from the power rear gate CM.

Trouble symptom:

The power rear gate does not operate normally.

Wiring diagram:


Power rear gate system  Ref. to [WIRING SYSTEM>Power Rear Gate System>WIRING DIAGRAM.](#)



LAN10711


1. CHECK DTC.



Read the DTC of body integrated unit using Subaru Select Monitor.  Ref. to [BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U0230 displayed? (Current malfunction)

Yes


 [Go to 2.](#)

No

It is possible that temporary poor contact occurs. Perform the clear memory


operation.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Clear memory.](#)

2. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the power rear gate CM and body integrated unit connectors.
3. Connect the disconnected connectors.
4. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U0230 displayed? (Current malfunction)

Yes

 [Go to 3.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the power rear gate CM and body integrated unit connectors.
3. Using the tester, measure the resistance between terminals.

Connector & terminal

(i171) No. 16 — (R423) No. 1:

(R422) No. 14 — Chassis ground:

(R423) No. 8 — Chassis ground:

Is the resistance less than 10 Ω?

Yes

 [Go to 4.](#)

No

Repair the open circuit of harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).


1. Disconnect the power seat CM connector. (With power seat memory)
2. Using the tester, measure the resistance between terminals.

Connector & terminal

(R423) No. 1 — Chassis ground:

Is the resistance 10 k Ω or more?

Yes

 [Go to 5.](#)

No

Repair the shorted portion of harness.

5. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).




1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between terminals.

Connector & terminal

(R423) No. 1 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes

 [Go to 6.](#)

No

Repair the shorted portion of harness.

6. CHECK HARNESS (POWER SUPPLY CIRCUIT).



1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between terminals.

Connector & terminal

(R422) No. 1 (+) — Chassis ground (-):

(R422) No. 10 (+) — Chassis ground (-):

(R422) No. 8 (+) — Chassis ground (-):

Is the voltage 9 V or more when the IG switch is ON?

Yes

 [Go to 7.](#)



No

Repair the open circuit of harness.

7. CHECK CONTROL MODULE.




1. Turn the ignition switch to OFF.


2. Replace the power rear gate CM with a properly functioning part.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)
3. Read the DTC of body integrated unit using Subaru Select Monitor.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U0230 displayed? (Current malfunction)


Yes

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

No

For models without power seat memory, malfunction occurred in the power rear gate CM. For models with power seat memory,  [Go to 8.](#)

8. CHECK CONTROL MODULE.

1. Connect the power seat CM connector.
2. Read the DTC of body integrated unit using Subaru Select Monitor.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U0230 displayed? (Current malfunction)

Yes

Replace the power seat CM.  [Ref. to SEATS>Power Seat System.](#)

No


Malfunction occurred in the power rear gate CM.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0327 SOFTWARE INCOMPATIBILITY WITH VEHICLE SECURITY CONTROL MODULE

No data is received from keyless access CM.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"

Received error data from ECM.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0402 INVALID DATA RECEIVED FROM TCM

Received error data from TCM.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

Received error data from VDC CM.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE

Received error data from combination meter.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0424 INVALID DATA RECEIVED FROM HVAC CONTROL MODULE

Received error data from A/C CM.

Note:


Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0427 INVALID DATA RECEIVED FROM VEHICLE SECURITY CONTROL MODULE

Received error data from keyless access CM.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1201 CAN-HS COUNTER ABNORMAL

Communication is unstable because of high speed CAN communication error.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1235 LOST COMMUNICATION WITH EYESIGHT

Data does not arrive from stereo camera.

Note:


Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1433 INVALID DATA RECEIVED FROM EYESIGHT

Error data is received from stereo camera.

Note:

Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1500 KEYLESS UART COM. MALFUNCTION

1. MODEL WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM

DTC detecting condition:

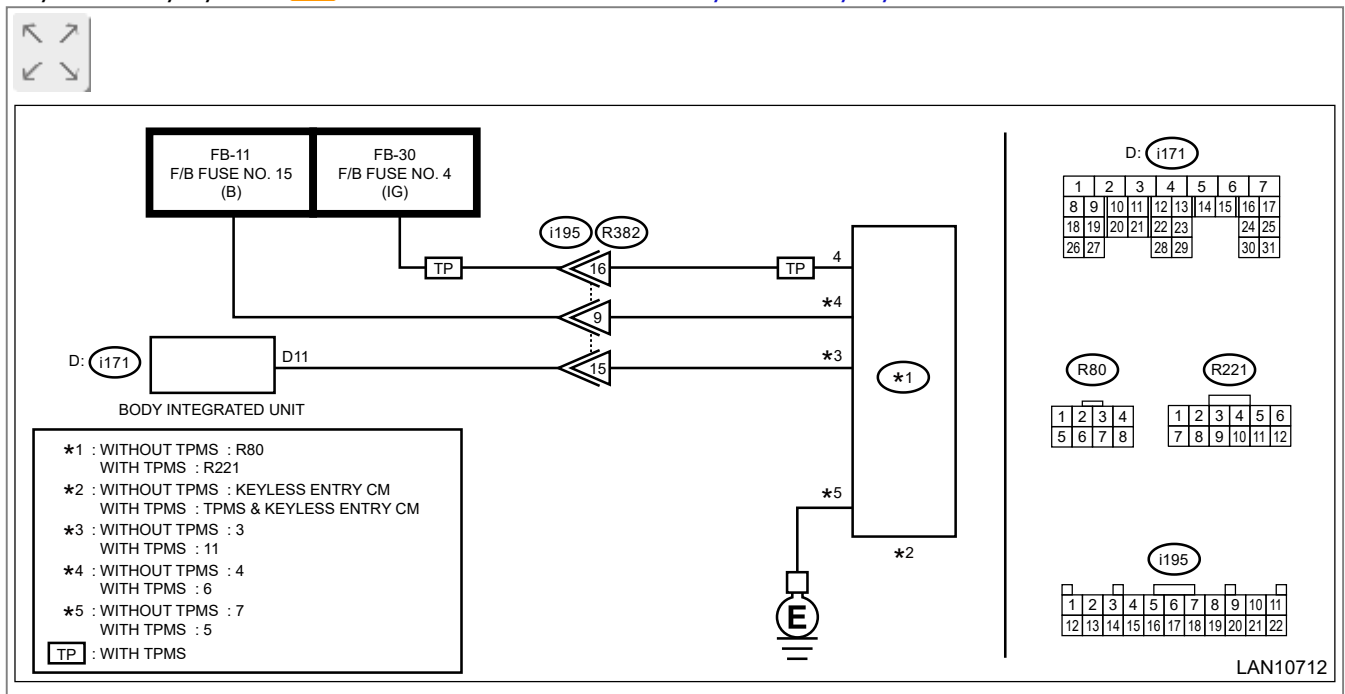
UART between the TPMS & keyless entry CM or keyless entry CM and the body integrated unit is open or shorted, or has communication failure.

Trouble symptom:


- Door lock does not operate with keyless.
- TPMS does not operate. (With the indicator blinking)

Wiring diagram:



Keyless entry system  [Ref. to WIRING SYSTEM>Keyless Entry System>WIRING DIAGRAM.](#)



1. CHECK DTC.

1. Insert the ignition key to the ignition key cylinder and remove.
2. Read the DTC of body integrated unit using Subaru Select Monitor.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U1500 displayed? (Current malfunction)

-  [Go to 2.](#)
-  [Go to 7.](#)

2. CHECK DTC.



1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit and the TPMS & keyless entry CM or keyless entry CM connector.
3. Connect the disconnected connectors.
4. Insert the ignition key to the ignition key cylinder and remove.
5. Read the DTC of body integrated unit using Subaru Select Monitor. [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U1500 displayed? (Current malfunction)

Yes

[Go to 3.](#)

No

[Go to 7.](#)

3. CHECK HARNESS (OPEN CIRCUIT).



1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit and the TPMS & keyless entry CM or keyless entry CM connector.
3. Using the tester, measure the resistance between terminals.

Connector & terminal

With TPMS

(i171) No. 11 — (R221) No. 11:

Without TPMS

(i171) No. 11 — (R80) No. 3:

Is the resistance 10 Ω or less?

Yes

[Go to 4.](#)

No

Repair the open circuit of harness or replace harness.

4. CHECK HARNESS (POWER SUPPLY CIRCUIT).



1. Turn the ignition switch to ON.
2. Use a tester to measure the voltage between the terminals.

Connector & terminal

With TPMS

(R221) No. 6 (+) — Chassis ground (-):

(R221) No. 4 (+) — Chassis ground (-):

Without TPMS

(R80) No. 4 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 5.](#)

No

Repair the power supply circuit.

5. CHECK HARNESS (GROUND CIRCUIT).

Using the tester, measure the resistance between terminals.

Connector & terminal

With TPMS

(R221) No. 5 — Chassis ground:

Without TPMS

(R80) No. 7 — Chassis ground:

Is the resistance 10 Ω or less?

Yes

 [Go to 6.](#)

No



Repair the ground circuit.

6. CHECK CONTROL MODULE.

1. Turn the ignition switch to OFF.
2. Remove the TPMS & keyless entry CM or the keyless entry CM.
3. Install a TPMS & keyless entry CM or keyless entry CM that was operating normally on another vehicle.

Does it operate with the remote control key of another vehicle?

Yes

Replace the TPMS & keyless entry CM or keyless entry CM.  [Ref. to SECURITY AND LOCKS>Keyless Entry Control Module>REMOVAL.](#)  [Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System>REMOVAL.](#)

No

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

7. CHECK CONNECTOR.

Check for poor contact of connectors used for keyless communication for poor contact.

Is the check result OK?

Yes

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

Repair or replace the poor contact of connector.

2. MODEL WITH KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM

DTC detecting condition:

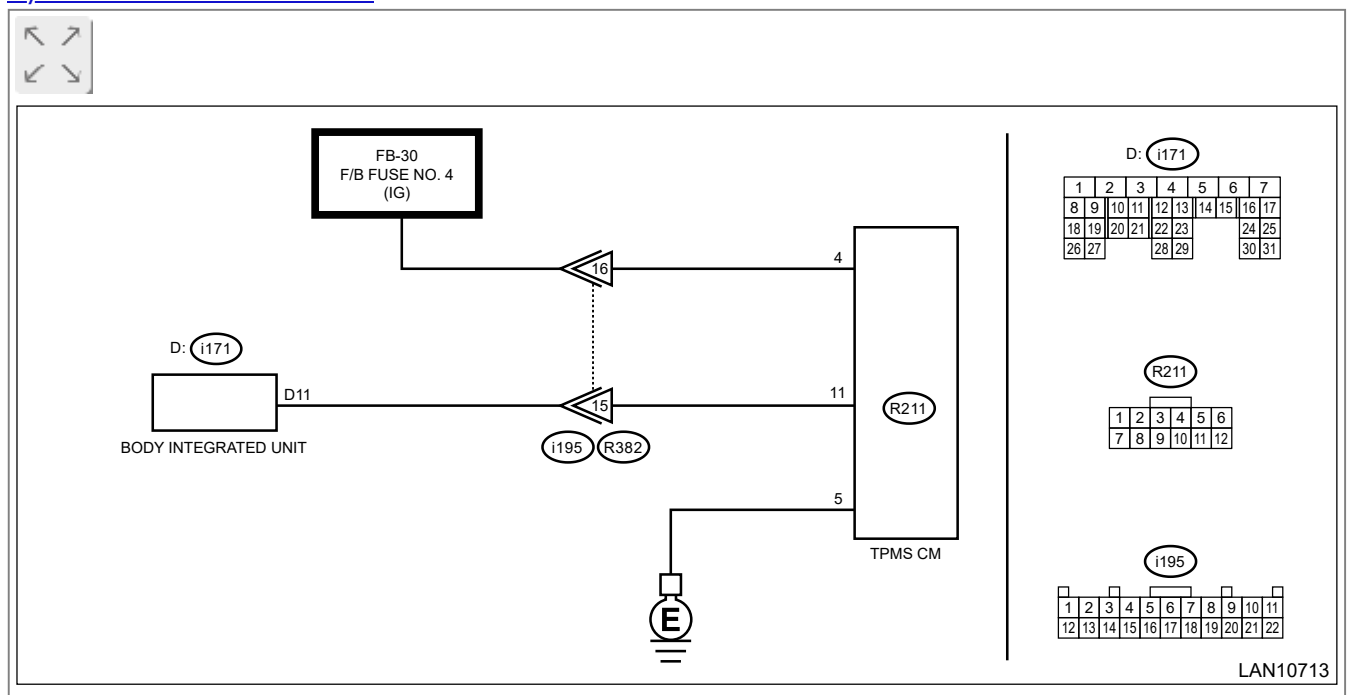
UART between the TPMS CM and the body integrated unit is open or shorted, or has communication failure.

Trouble symptom:


TPMS does not operate. (With the indicator blinking)

Wiring diagram:

Tire Pressure Monitoring System  [Ref. to WIRING SYSTEM>Tire Pressure Monitoring System>WIRING DIAGRAM.](#)




1. CHECK DTC.

1. With the access key in the vehicle, press the push button ignition switch twice without depressing the brake to turn the ignition switch to ON.
2. Read the DTC of body integrated unit using Subaru Select Monitor.  [Ref. to BODY](#)

[CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U1500 displayed? (Current malfunction)


Yes

 [Go to 2.](#)

No

 [Go to 7.](#)

2. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit and the TPMS CM connector.
3. Connect the disconnected connectors.
4. With the access key in the vehicle, press the push button ignition switch twice without depressing the brake to turn the ignition switch to ON.
5. Read the DTC of body integrated unit using Subaru Select Monitor.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U1500 displayed? (Current malfunction)

Yes

 [Go to 3.](#)

No

 [Go to 7.](#)

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit and the TPMS CM connector.
3. Using the tester, measure the resistance between terminals.

Connector & terminal

(i171) No. 11 — (R211) No. 11:

Is the resistance 10 Ω or less?

Yes

 [Go to 4.](#)

No

Repair the open circuit of harness or replace harness.

4. CHECK HARNESS (POWER SUPPLY CIRCUIT).

1. Turn the ignition switch to ON.


2. Use a tester to measure the voltage between the terminals.

Connector & terminal

(R211) No. 4 (+) — Chassis ground (—):

Is the voltage 10 V or more?

Yes

 [Go to 5.](#)

No

Repair the power supply circuit.

5. CHECK HARNESS (GROUND CIRCUIT).



Using the tester, measure the resistance between terminals.

Connector & terminal

(R211) No. 5 — Chassis ground:

Is the resistance 10 Ω or less?

Yes

 [Go to 6.](#)

No

Repair the ground circuit.


6. CHECK CONTROL MODULE.



1. Turn the ignition switch to OFF.
2. Remove the TPMS CM.
3. Install a TPMS CM that was operating normally on another vehicle.

Does it operate with the remote control key of another vehicle?

Yes

Replace the TPMS CM.  [Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System>REMOVAL > TPMS CM.](#)

No

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

7. CHECK CONNECTOR.



Check for poor contact of connectors used for keyless communication for poor contact.

Is the check result OK?



Yes

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No


Repair or replace the poor contact of connector.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Body Control], and then select [Enter].
5. On [Select Function] display, select [DTC].

Note:

- For detailed operation procedures, refer to "Application help".
- For details concerning DTC, refer to List of Diagnostic Trouble Code (DTC).
 [Ref. to BODY CONTROL\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

INSPECTION

1. HIGH BEAM ASSIST INDICATOR DOES NOT ILLUMINATE

Trouble symptom:

High beam assist indicator light does not illuminate though the operating conditions for the high beam assist are met.

Note:

When there is faulty in the combination switch, combination meter, illumination sensor for the auto lighting or the operation of auto lighting, perform the diagnosis for each system in advance.

1. CHECK BODY INTEGRATED UNIT SETTING.

Using the Subaru Select Monitor, check the data monitor [High Beam Assist Function Setting (EyeSight System)] and [High Beam Assist Current Setting] of the body control.

Is [High Beam Assist Function Setting (EyeSight System)] set to [ON], and [High Beam Assist Current Setting] set to [ON]?

Yes

 [Go to 2.](#)

No

Set [High Beam Assist Function Setting (EyeSight System)] to [ON], and set [High Beam Assist Current Setting] to [ON].

2. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs.

Are any DTCs displayed? (Current malfunction)

Yes

Perform the diagnosis for the displayed DTCs.

No

 [Go to 3.](#)

3. CHECK "EyeSight TEMPORARY STOP INDICATOR".

- 1.** Turn the ignition switch to OFF.
- 2.** Turn the ignition switch to ON.
- 3.** Check "EyeSight temporary stop indicator".

Is "EyeSight temporary stop indicator" displayed?

Yes

Perform inspection according to "Check EyeSight temporary stop code" in "EyeSight (DIAGNOSTICS)".

No

 [Go to 4.](#)

4. CHECK HIGH BEAM ASSIST INDICATOR.

1. Turn the ignition switch to ON.
2. Set the light SW position to Auto.
3. Set the dimmer Hi SW to ON.
4. Shade the illumination sensor for the auto lighting.

Does the high beam assist indicator illuminate?

Yes

The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.


Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

 [Go to 5.](#)

5. CHECK HIGH BEAM ASSIST INDICATOR.

Connect the Subaru Select Monitor, and, perform the active test [HBA indicator] for the combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Active Test.](#)

Does the high beam assist indicator illuminate?

Yes

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

No

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

2. THE LIGHTING DOES NOT SWITCH FROM LOW BEAM TO HIGH BEAM AUTOMATICALLY

Trouble symptom:

The lighting does not switch to the high beam while the high beam assist indicator is illuminating, even when there is no object in front of the vehicle.


1. CHECK HIGH BEAM ACTIVATION (CHECK BY MANUAL OPERATION).

Check for the activation of the high beam.


1. Light SW position: Second notch
2. Dimmer Hi SW: ON

Does the high beam light come on?


Yes

 [Go to 2.](#)

No

Check the headlight system.  [Ref. to LIGHTING SYSTEM>Headlight System.](#)

2. CHECK DTC.

Read the DTC related to EyeSight using the Subaru Select Monitor.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Code\(s\) Display.](#)

Are any DTCs displayed? (Current malfunction)

Yes

Perform the diagnosis for the displayed DTCs.

No

 [Go to 3.](#)

3. CHECK "EyeSight TEMPORARY STOP INDICATOR".


1. Turn the ignition switch to OFF.
2. Turn the ignition switch to ON.
3. Check "EyeSight temporary stop indicator".

Is "EyeSight temporary stop indicator" displayed?

Yes

Perform inspection according to "Check EyeSight temporary stop code" in "EyeSight (DIAGNOSTICS)".

No

 [Go to 4.](#)

4. PERFORM RECOGNIZATION TEST (JUDGMENT OF NIGHT STATUS).




1. Set the light SW position to Auto.
2. Set the dimmer Hi SW to ON.
3. With the vehicle stopped, turn the ignition switch to OFF.
4. Shade the front of the stereo camera.

Note:

It is recommended to perform the test under complete dark environment where all illumination is turned off and there is no windows in the room. If it is not possible to perform the test in complete dark environment, perform the test in a room where the direct sunlight is shielded and illumination is turned off, while the windshield, driver's seat, and passenger's seat are covered from outside of the vehicle with cloth etc. having high light-blocking effect.

Caution:

In order to avoid touching the lens of the stereo camera, do not apply light-blocking measures directly at the lens portion.

5. Turn the ignition switch to ON.
6. Using the Subaru Select Monitor, check the data monitor [Judgment Night] of the EyeSight.  [Ref. to EyeSight \(DIAGNOSTICS\)>Data Monitor.](#)

Is [Judgment Night] set to [Night]?

Yes

System is normal. It is considered that the conditions for the high beam activation are not satisfied enough for an environmental reason.

No

Replace the stereo camera.  [Ref. to EyeSight>Stereo Camera.](#)

3. THE LIGHTING DOES NOT SWITCH FROM HIGH BEAM TO LOW BEAM AUTOMATICALLY

Trouble symptom:

The lighting does not switch to the low beam, even when the high beam assist indicator is illuminating.

1. CHECK HIGH BEAM ACTIVATION (CHECK BY MANUAL OPERATION).



Check for the activation of the high beam.


1. Light SW position: Second notch
2. Dimmer Hi SW: ON

Does the high beam light come on?

Yes

 [Go to 2.](#)

No

Check the headlight system.  [Ref. to LIGHTING SYSTEM>Headlight System.](#)

2. CHECK LOW BEAM ACTIVATION (CHECK BY MANUAL OPERATION).




From the condition in step 1), turn the dimmer Hi SW to OFF.

Does it switch to low beam?

Yes


 [Go to 3.](#)

No

Check the headlight system.  [Ref. to LIGHTING SYSTEM>Headlight System.](#)

3. PERFORM RECOGNITION TEST (CHECK HBA HI PERMISSION FLAG).




1. Set the vehicle in a stopped state.
2. Set the light SW position to Auto.
3. Set the dimmer Hi SW to ON.
4. Using the Subaru Select Monitor, check the data monitor [HBA Control Permission] of EyeSight.  [Ref. to EyeSight \(DIAGNOSTICS\)>Data Monitor.](#)

Is [HBA Control Permission] set to [Allowance]?

Yes

Replace the stereo camera.  [Ref. to EyeSight>Stereo Camera.](#)




No

Check the headlight system.  [Ref. to LIGHTING SYSTEM>Headlight System.](#)

BODY CONTROL(DIAGNOSTICS) > Diagnostics with Phenomenon

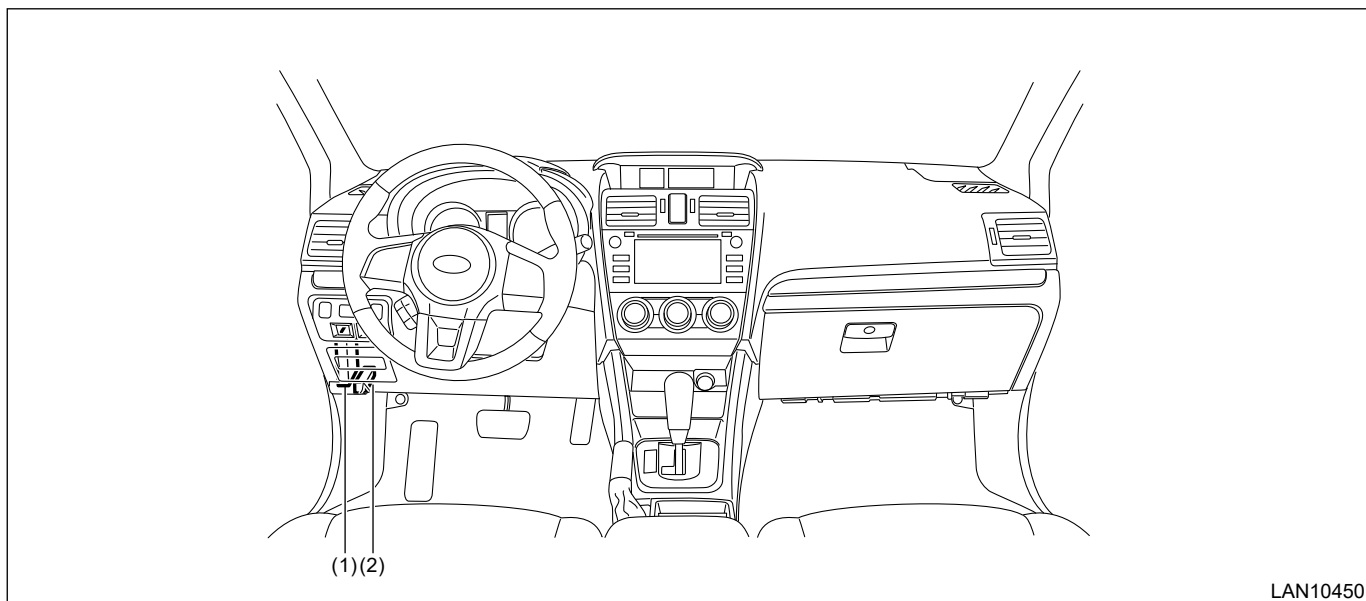
LIST

1. HIGH BEAM ASSIST SYSTEM

Symptoms	Note
High beam assist indicator does not illuminate.	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > HIGH BEAM ASSIST INDICATOR DOES NOT ILLUMINATE.
The lighting does not switch from low beam to high beam automatically	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE LIGHTING DOES NOT SWITCH FROM LOW BEAM TO HIGH BEAM AUTOMATICALLY.
The lighting does not switch from high beam to low beam automatically	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE LIGHTING DOES NOT SWITCH FROM HIGH BEAM TO LOW BEAM AUTOMATICALLY.

BODY CONTROL(DIAGNOSTICS) > Electrical Component Location

LOCATION



LAN10450

(1) Body integrated unit

(2) Data link connector

BODY CONTROL(DIAGNOSTICS) > General Description

CAUTION

1. SRS AIRBAG SYSTEM

Airbag system wiring harness is routed near the body integrated unit and body control circuits.




Caution:

- **Do not use the electrical test equipment on all airbag system wiring harnesses and connectors.**
- **Be careful not to damage the airbag system wiring harness, when servicing the body control system.**

BODY CONTROL(DIAGNOSTICS) > General Description

INSPECTION


Before performing diagnosis, check the following items which might affect body control system problems.

- 1.** Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)
- 2.** Check the fuse condition.
Make sure that ampere of the fuse is setting value, and it is not blown out.
- 3.** Check the connecting condition of harness and harness connector.
- 4.** Confirm settings of body integrated unit are corresponded to vehicle equipment.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Registration Body Integrated Unit.](#)
- 5.** Make sure that the customizing of the body integrated unit matches the vehicle equipment.
 [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Customize.](#)
- 6.** Confirm [Factory initial setting] of body integrated unit registrations is [Market].

BODY CONTROL(DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	— (Newly adopted tool)	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

BODY CONTROL(DIAGNOSTICS) > General Diagnostic Table

INSPECTION

Using the Subaru Select Monitor, read DTC, or check the following data on the current data display to make judgments.

Item	Operation	Specifications		Note
		YES	NO	
DTC	DTC is not displayed when inspecting all DTCs.	DTC is not displayed.	Perform the diagnosis for the displayed DTCs.	—
Clearance light (Low beam) (High beam)	Clearance light and low/high beams illuminate normally when the switch is operated. Indicator in the meter illuminates at the same time.	System is normal.	Check the lighting system, combination meter system and LAN system.	—
Auto light	When the area around the light control sensor is darkened after the ignition switch and the lighting switch (AUTO) are turned to ON, the clearance light and the low beam illuminate after 15 seconds. Indicator in the combination meter illuminates at the same time.	System is normal.	Check the lighting system, combination meter system and LAN system.	—
	When the ignition switch and the lighting switch (AUTO) are turned to ON after the area around the light control sensor is darkened, the clearance light and the low beam illuminate immediately. Indicator in the combination meter illuminates at the same time.			—
Fog light	Front fog light illuminates when the switch is operated. Indicator in the	System is normal.	Check the lighting system, combination	—









	meter illuminates at the same time.		meter system and LAN system.	
Rear defogger	Rear defogger operates when the switch is operated. The indicator illuminates at the same time.	System is normal.	Check the rear window defogger system and A/C system.	—
Wiper deicer	Wiper deicer operates when the switch is operated. The indicator illuminates at the same time. When the ambient temperature is 5°C (41°F) or higher, press the switch 3 seconds or more to forcibly activate the system.	System is normal.	Check the wiper deicer system and A/C system.	Wiper deicer operates when "Wiper deicer setting" of the body integrated unit is set to on.
DRL	After starting the engine and releasing the parking brake, the DRL illuminates.	System is normal.	Check the lighting system and LAN system.	—
Rear wiper	Rear wiper operates when the switch is operated.	System is normal.	Check wiper or washer system.	Depending on user customizing "Sedan/Wagon Setting" of the body integrated unit, vehicle sensory time varies.
Key interlock	<ul style="list-style-type: none"> Key cannot be removed in other than P range. Key can be removed in other than P range. 	System is normal.	Check the body control system.	—
Shift lock	The select lever can be moved from the P range to other ranges only when the brake pedal is depressed with IG ON.	System is normal.	Check the body control system.	—
Key warning switch alarm	When the driver's door is open without the key removed, the buzzer sounds.	System is normal.	Check the combination meter and body control system.	—
Door lock	The doors lock/unlock when the door switch is operated. Rear gate/trunk opens when	System is normal.	Check the security & lock	If user customizing "Sedan/Wagon Setting" is different,


	the rear gate/trunk release switch is operated.		and body control system.	trunk and rear gate do not open.
Keyless entry	The lock locks/unlocks when the keyless transmitter is operated. Trunk/rear gate unlocks when trunk/rear gate unlock button is operated.	System is normal.	Check the keyless entry and body control system.	—
Answer back	Answer-back operates when the keyless entry locks/unlocks.	System is normal.	Check the security & lock system, and LAN system.	—
Room light	The light illuminates/goes off according to the door open/close.	System is normal.	Check the room light system, security & lock system, and LAN system.	—
Map light	The light illuminates/goes off according to the door open/close. (Except for rear gate)	System is normal.	Check the spot map light, security & lock system, and LAN system.	—
Luggage/trunk light	The light illuminates/goes off according to the rear gate open/close.	System is normal.	Check the luggage/trunk light, security & lock system, and LAN system.	—
Key illumination	The light illuminates/goes off according to the driver's door open/close.	System is normal.	Check the ignition switch illumination, security & lock, and LAN system.	—
Illumination control	Illumination volume control is available.	System is normal.	Check the illumination control switch, combination meter, and body control system.	Illumination volume control is not available when user customizing "Illumination Control On/Off" of the body integrated unit is set to off.
Engine start	Engine starts.	System is normal.	Check the engine system,	—








			immobilizer, and LAN system.	
Vehicle security	Security monitoring/security canceling can be performed by operating the keyless entry.	System is normal.	Check the security & lock system, and LAN system.	Security monitoring starts and at the same time the warning buzzer sounds, when impact sensor is not connected and user customizing "Impact Sensor" of the body integrated unit is set to on.
Welcome lighting (enter)	After turning the lighting switch (AUTO) to ON, use keyless transmitter or access key to unlock. At this time, the clearance light and headlight low beam illuminates for the preset time. And, use keyless transmitter or access key to lock. At this time, the clearance light and headlight low beam go off.	System is normal.	Check the lighting system (auto light), security & lock (keyless entry) or keyless access with push button start system.	Operates when user customization item "Illumination Sensor Setting" in body integrated unit is set to ON and "Welcome Light Off Delay Time(Approaching)" is set to other than OFF.
Welcome lighting (exit)	The clearance light and headlight low beam continues to illuminate, when the ignition switch is OFF (or when the key is removed for vehicles without keyless access with push button start system) while the auto light function is operating. Use keyless transmitter or access key to lock two consecutive times. At this time, the clearance light and headlight low beam go off.	System is normal.	Check the lighting system (auto light), security & lock (keyless entry) or keyless access with push button start system.	Operates when user customization item "Illumination Sensor Setting" in body integrated unit is set to ON and "Welcome Light Off Delay Time(Exiting)" is set to other than OFF.









BODY CONTROL(DIAGNOSTICS) > List of Diagnostic Trouble Code (DTC)



LIST

DTC	Item	Content of diagnosis	Note
B1010	BODY CONTROL SYSTEM (BIU) MALFUNCTION	Body integrated unit internal error	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1010 BODY CONTROL SYSTEM (BIU) MALFUNCTION.
B1011	BATTERY CONTROL POWER SUPPLY	Voltage malfunction caused by poor contact of battery power supply control circuits	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1011 BATTERY CONTROL POWER SUPPLY.
B1012	BATTERY BACKUP POWER SUPPLY	Voltage malfunction caused by poor contact of battery power supply backup circuits	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1012 BATTERY BACKUP POWER SUPPLY.
B1013	IGNITION POWER	Voltage malfunction caused by poor contact of IGN power supply circuits	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1013 IGNITION POWER.
B1014	ACC POWER	Voltage malfunction caused by poor contact of ACC power supply circuits	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1014 ACC POWER.
B1015	KEY INTERLOCK CIRCUIT	GND-output short of key interlock circuit	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1015 KEY INTERLOCK CIRCUIT.
B1016	SHIFT LOCK CIRCUIT	Voltage malfunction caused by poor contact of shift lock circuits	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1016 SHIFT LOCK CIRCUIT.
B1401	METER COLLATION	Immobilizer related malfunction	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble

			Code (DTC)>DTC B1401 METER COLLATION.
B1402	IMMOBILIZER KEY COLLATION	Immobilizer related malfunction	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1402 IMMOBILIZER KEY COLLATION.
B1405	SCU COLLATION	Immobilizer related malfunction	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1405 SCU COLLATION.
B1406	SCU_EEPROM	Defective security control module	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1406 SCU EEPROM.
B1407	MET COMMUNICATION	Communication failure between body integrated unit and combination meter	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1407 MET COMMUNICATION.
B1408	METER NON-VOLATILE MEMORY	Defective combination meter	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1408 METER NON-VOLATILE MEMORY.
B1409	SCU COMMUNICATION	Communication failure between body integrated unit and security control module	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1409 SCU COMMUNICATION.
B1410	TRANSPONDER COMMUNICATION	Communication failure between key and body integrated unit	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1410 TRANSPONDER COMMUNICATION.
B1411	IMMOBILIZER ANTENNA	Faulty antenna	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1411 IMMOBILIZER ANTENNA.
U0073	CONTROL MODULE COMMUNICATION BUS OFF	Any unit is cut communication.	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble

			Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	Not received data from ECM.	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0101	LOST COMMUNICATION WITH TCM	Not received data from TCM.	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Data does not arrive from VDC module.	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Data does not arrive from meter.	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0164	LOST COMMUNICATION WITH HVAC CONTROL MODULE	Data does not arrive from A/C control panel.	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0164 LOST COMMUNICATION WITH HVAC CONTROL MODULE.
U0208	LOST COMMUNICATION WITH SEAT MEMORY	Communication error occurred with power seat CM.	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0208 LOST COMMUNICATION WITH SEAT MEMORY.
U0230	LOST COMMUNICATION WITH POWER REAR GATE CONTROL MODULE	Communication error occurred with power rear gate.	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0230 LOST COMMUNICATION WITH POWER REAR GATE CONTROL MODULE.
U0327	SOFTWARE	Data does not arrive	 Ref. to BODY

	INCOMPATIBILITY WITH VEHICLE SECURITY CONTROL MODULE	from keyless access CM.	CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0327 SOFTWARE INCOMPATIBILITY WITH VEHICLE SECURITY CONTROL MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	Received error data from ECM.	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".
U0402	INVALID DATA RECEIVED FROM TCM	Received error data from TCM.	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0402 INVALID DATA RECEIVED FROM TCM.
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	Error data is received from VDC module.	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	Received error data from meter.	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.
U0424	INVALID DATA RECEIVED FROM HVAC CONTROL MODULE	Error data is received from A/C control panel.	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0424 INVALID DATA RECEIVED FROM HVAC CONTROL MODULE.
U0427	INVALID DATA RECEIVED FROM VEHICLE SECURITY CONTROL MODULE	Error data is received from keyless access CM.	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0427 INVALID DATA RECEIVED FROM VEHICLE SECURITY CONTROL MODULE.
U1201	CAN-HS COUNTER ABNORMAL	Malfunction of high-speed CAN communication	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1201 CAN-HS COUNTER ABNORMAL.
U1235	LOST COMMUNICATION	Data does not arrive	 Ref. to BODY

	WITH EyeSight	from stereo camera.	CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1235 LOST COMMUNICATION WITH EyeSight.
U1433	INVALID DATA RECEIVED FROM EyeSight	Communication error occurred with stereo camera.	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1433 INVALID DATA RECEIVED FROM EyeSight.
U1500	KEYLESS UART COM. MALFUNCTION	Open or short circuit in keyless UART circuit	 Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1500 KEYLESS UART COM. MALFUNCTION.

BODY CONTROL(DIAGNOSTICS) > Registration Body Integrated Unit

OPERATION

1. CONFIRM CURRENT SETTING

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Body Control], and then select [Enter].
5. On [Select Function] display, select [Customize].
6. Save the setting.

Required items for new registration. (Except for system not equipped)



Item	Item to confirm				Remarks
	1	2	3	4	
number of regist.	1	2	3	4	Number of registered ID
Off delay time	OFF	10 Sec	20 Sec	30s	Setting for lighting off time
Auto Light Sensitivity Adjustment	Dull	Normal	Sensitive	Very sensitive	—
Power rear gate setting	Exist		Not Exist		—
Lane change signal setting	Exist		Not Exist		—
Rear wiper auto setting	Exist		Not Exist		—
Xmode SW setting	Exist		Not Exist		—
TPMS Setting	TPMS		No TPMS		—
Driver's Door Unlock Setting	ALL		Selection		—
Rear Gate Unlock Setting	ALL		Selection		—
One-touch Turn Signal System Setup	ON		OFF		—
Auto Wiper System (Rear) Setup	ON		OFF		—
Daytime Running Light(DRL) Setting for North America	Alternate DRL System		High Beam Dimming System		—
Steering Responsive Fog Lamp Setting	Exist		Not Exist		—
Head Lamp Low Beam Specification	Halogen HID LED				Fixed to Halogen
Head Lamp High Beam Specification	Halogen HID LED				Fixed to Halogen
High Beam Assist Current Setting	ON		OFF		—
High Beam Assist Function Setting (EyeSight System)	Exist		Not Exist		—
Rr Defogger op. mode	Normal		Continuous		—
Security Alarm Setup	ON		OFF		—
Impact Sensor Setup	ON		OFF		Option setting

Alarm delay setup	ON	OFF	—
Lockout prevention	ON	OFF	—
Impact sensor	Exist	Not Exist	Option setting
Answer-back buzzer setup	ON	OFF	—
Hazard answer-back setup	ON	OFF	—
Passive Alarm	ON	OFF	—
Door open warning	Exist	Not Exist	—
Dome Light Alarm Setting	ON	OFF	—
Auto A/C Setting	Exist	Not Exist	—
wiperdeicer	Exist	Not Exist	Option setting
Illumination Control On/Off	Exist	Not Exist	—
Sedan/Wagon Setting	Wagon	Sedan	—
MT/AT Setting	MT	AT	—
Seat Memory Setting	Exist	Not Exist	—
Illumination Sensor Setting	Exist	Not Exist	—
Factory initial setting	Factory	Market	Do not change to factory mode.
Auto Wiper/INT Setting	AUTO	INT	—
Welcome Light Off Delay Time(Approaching)	OFF 30 seconds 60 seconds 90 seconds		—
Welcome Lighting (Exiting)	OFF 30 seconds 60 seconds 90 seconds		—
Keyless Buzzer Volume	1 2 3 4 5 6 7		—

2. REGISTRATION BODY INTEGRATED UNIT (FUNCTION SETTING)

Caution:


For the body integrated unit, function selection is available to control the entire vehicle systems. It is possible to control the original functions of vehicle when registrations of body integrated unit and function setting are corresponded to vehicle equipment. If registrations and function setting are different from vehicle equipment, vehicle system does not operate normally and diagnosis cannot be performed correctly. Pay attention to following item.

- **Be sure to correspond registrations, or User Customizing settings to vehicle equipment.**
- **Do not change the settings of vehicle improperly.**
- **Make sure that the key illumination does not blink with ignition switch ON, or that the body integrated unit registration item Factory initial setting is set to Market. If [Factory initial setting] is set to Factory, the key illumination blinks when the ignition switch is turned ON, to notify that the settings are not confirmed. (For models with keyless access with push button start system, the room light blinks.)**
- **Key illumination does not blink with ignition switch turned to ON and go off with door closed. (Except for model with the keyless access with push button start system)**
- **Be sure to register immobilizer if body integrated unit is replaced with a new part. (Models without the keyless access with push button start system)**
- **Make a registration of immobilizer when the parts related to immobilizer have been replaced. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a**

separate volume.

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Body Control], and then select [Enter].
5. On [Select Function] display, select [Customize].

Note:

For the vehicle requiring the destination setting, if the destination setting is not finished, display can not be shifted into customizing screen.  Ref. to [BODY CONTROL\(DIAGNOSTICS\)>Registration Body Integrated Unit>OPERATION > DESTINATION SETTING.](#)

6. Change the setting to the contents saved at confirmation of current setting.

Caution:

- **To perform normal operation of vehicle and diagnosis, the above settings must match the actual vehicle equipment.**
- **When the body integrated unit is new or in Factory mode, the key illumination blinks, and user customizing is incomplete. Check the user customizing settings. (For models with keyless access with push button start system, the room light blinks.)**
- **Be sure not to change Factory initial setting except when installing a new body integrated unit.**


Note:

“Factory” mode:

- **Body integrated unit has not been set yet. It can be recognized by key illumination blinking with ignition switch turned to ON. (Except for model with keyless access)**
- **All replacement body integrated units are set to “Factory” mode. When replacing a body integrated unit, be sure to perform the registration operation.**

“Market” mode:

- **Each settings have been set. It can be recognized by key ring illumination coming on in concocting with room light and going off with ignition switch turned to ON. For model with keyless access with push button start system, it can be recognized by room light not blinking with ignition switch turned to ON.**

7. Perform [Factory initial setting]. On [Customize] of Subaru Select Monitor, select Factory initial setting.
8. Change the mode from Factory to Market.
9. Turn the ignition switch to OFF to settle the setting.
10. Perform the User Customizing.  Ref. to [BODY CONTROL\(DIAGNOSTICS\)>Customize.](#)
11. Change the Subaru Select Monitor system selection to [Immobilizer], and register the immobilizer according to the “REGISTRATION MANUAL FOR IMMOBILIZER” provided as a separate volume. (Except for model with keyless access with push button start system or model without immobilizer)
12. For vehicles with remote engine starter, refer to “REGISTRATION MANUAL FOR IMMOBILIZER” provided as a separate volume and perform registration of the remote engine starter. (Except for model with the keyless access with push button start system)

3. DESTINATION SETTING

Note:

For the vehicle requiring the destination setting, if the destination setting is not finished, display can not be shifted into customizing screen.

1. CONFIRM CURRENT SETTING.



Always perform confirmation of current setting before replacing the module.

Record the contents of the destination setting.

Note:

Refer to the data monitor [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Data Monitor. and current setting](#) [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Registration Body Integrated Unit>OPERATION >CONFIRM CURRENT SETTING. to confirm the current setting.](#)

Is the current setting recorded?

Yes

[Go to 2.](#)

No

Confirm the current setting. [Go to 1.](#)

2. CONFIRM DESTINATION SETTING.



1. Connect the Subaru Select Monitor, and run the application.
2. On [Start] display, select [Diagnosis].
3. On [Vehicle selection] display, input the target vehicle information and select [OK].
4. On [Main Menu] display, select [Each System].
5. On [Select System] display, select [Body Control], and then select [Enter].
6. On [Select Function] display, select [Customize].
7. The vehicle destination screen is displayed.

Is the vehicle destination setting screen displayed?

Yes

[Go to 3.](#)

No

[Go to 4.](#)

3. CONFIRM DESTINATION SETTING.



Confirm the screen displayed on Subaru Select Monitor and the actual vehicle destination.

Is it necessary to change the destination setting?

Yes

Select Yes, and [Go to 4.](#)

No

Select No, and [Go to 5.](#)

4. ENTER DESTINATION CODE.



Enter the appropriate code in the screen.

U4, U5, U6, C4 and C0, C5 (models with keyless access with push button start system): U400

C0, C5 (models without the keyless access with push button start system): C000

Is the appropriate code entered?

Yes

Select OK, and [Go to 5.](#)

No

Enter the destination code. [Go to 4.](#)

5. REGISTER VEHICLE EQUIPMENT.



Customizing screen is displayed.

Note:

Match the each item setting of body integrated unit registration item list with the vehicle equipment.

Do all setting contents match with the vehicle equipment specification?

Yes

[Go to 6.](#)

No

Change the items until each content setting match with the vehicle equipment specification. [Go to 5.](#)

6. CONFIRM MARKET MODE.



1. On the customizing screen, select the Factory initial setting to change the setting from Factory mode to Market mode.

2. Turn the ignition switch to OFF.

Note:

When the setting is changed from "Factory" mode to "Market" mode, turning the ignition switch from ON → OFF confirms the setting.

3. Turn the ignition switch to ON, and check the contents of settings.

Is the mode changed to "Market" mode?

Yes

[Go to 7.](#)

No

Perform the destination setting from the first step. [Go to 1.](#)

7. CONFIRM MARKET MODE.



Check the following.

- Destination: When set to U4, U5, U6, C4 and C0, C5 (models with keyless access with push button start system)
The "destination setting" of the data monitor is set to U4, U5, U6, C4.
- Destination: When set to C0, C5 (models without keyless access with push button start system)
The "destination setting" of the data monitor is set to C0, C5.

Is the display the same as indicated?

Yes

Registration of body integrated unit is finished.

No

It is possible that harness malfunction may occur. Perform the diagnosis.

Note:

How to confirm when the destination code is not known.

Option code (destination code + OP code)	Application range	Destination code
U4**	Must be set for all vehicles.	U400
U5**		
U6**		
C4**		
C0**	Only models without keyless access with push button start system need settings.	C000
C5**		

PROCEDURE



Caution:

Remove foreign matter (dust, water, oil etc.) from the VDCCM&H/U connector during removal and installation.

Note:

- To check the harness for open or short circuits, shake problem spot or connector.
- Refer to "Check List for Interview".  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Check List for Interview.](#)

1. CHECK PRE-INSPECTION.

1. Ask the customer when and how the trouble occurred using the interview check list.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Check List for Interview.](#)
2. Before performing diagnostics, check the component which might affect VDC problems.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>General Description>INSPECTION.](#)

Is the check result OK?


Yes

 [Go to 2.](#)


No

Repair or replace each component.

2. CHECK INDICATION OF DTC.


1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Read the DTC using the Subaru Select Monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Note:


If the communication function of the Subaru Select Monitor cannot be executed properly, check the communication circuit.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>INSPECTION > COMMUNICATION FOR INITIALIZING IMPOSSIBLE.](#)

Is DTC displayed on Subaru Select Monitor?


Yes

Record the DTC, time stamp and freeze frame data.  [Go to 4.](#)





Note:

- For the time stamp, refer to LAN section.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>General Description>CAUTION > TIME STAMP.](#)
- Depending on DTCs, time stamp may not be stored.

No

 [Go to 3.](#)

3. PERFORM GENERAL DIAGNOSTICS.




1. Perform the inspection by referring to "General Diagnostic Table".  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>General Diagnostic Table.](#)
2. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)
5. Check that the DTC is not displayed.

Do the VDC warning light & VDC indicator light, VDC OFF indicator light and ABS warning light go off after starting the engine?

Yes

Finish the diagnosis.


No



Check the combination meter circuit.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Warning Light Illumination Pattern>ABS WARNING LIGHT DOES NOT GO OFF.](#)  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Warning Light Illumination Pattern>VDC WARNING LIGHT AND VDC INDICATOR LIGHT DO NOT GO OFF.](#)  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Warning Light Illumination Pattern>VDC OFF INDICATOR LIGHT DOES NOT GO OFF.](#)

4. PERFORM DIAGNOSIS.

1. Refer to "List of Diagnostic Trouble Code (DTC)".

Note:

For the DTC list, refer to "List of Diagnostic Trouble Code (DTC)".  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

2. Correct the cause of trouble.
3. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
4. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)

5. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is DTC displayed?

Yes

Repeat step 4 until DTC is not shown.

No

Finish the diagnosis.

BRAKE CONTROL (DIAGNOSTICS) > Check List for Interview

CHECK

Check the following item about the vehicle’s state.

1. STATE OF ABS WARNING LIGHT



ABS warning light illuminates.	<input type="checkbox"/> Always <input type="checkbox"/> Sometimes <input type="checkbox"/> Only once <input type="checkbox"/> Does not illuminate • When/How long does it illuminate?		
Ignition key position	<input type="checkbox"/> LOCK <input type="checkbox"/> ACC <input type="checkbox"/> ON (before starting engine) <input type="checkbox"/> START <input type="checkbox"/> ON (after starting engine, engine is running) <input type="checkbox"/> ON (after starting engine, engine is at a standstill)		
Timing	<input type="checkbox"/> Immediately after turning the ignition switch to ON <input type="checkbox"/> Immediately after turning the ignition switch to START		
	<input type="checkbox"/> While accelerating	—	km/h
		—	MPH
	<input type="checkbox"/> While driving at a constant speed	km/h	MPH
		—	MPH
	<input type="checkbox"/> While decelerating	—	km/h
		—	MPH
	<input type="checkbox"/> When turning to the right	Steering angle:	deg
		Steering time:	Sec.
	<input type="checkbox"/> When turning to the left	Steering angle:	deg
Steering time:		Sec.	
<input type="checkbox"/> When other electrical parts are operating • Part name: • Operating condition:			

2. STATE OF VDC WARNING LIGHT & VDC INDICATOR LIGHT



VDC warning light & VDC indicator light illuminates.	<input type="checkbox"/> Always <input type="checkbox"/> Sometimes <input type="checkbox"/> Only once <input type="checkbox"/> Does not illuminate • When/How long does it illuminate?		

Ignition key position	<input type="checkbox"/> LOCK <input type="checkbox"/> ACC <input type="checkbox"/> ON (before starting engine) <input type="checkbox"/> START <input type="checkbox"/> ON (after starting engine, engine is running) <input type="checkbox"/> ON (after starting engine, engine is at a standstill)			
Timing	<input type="checkbox"/> Immediately after turning the ignition switch to ON <input type="checkbox"/> Immediately after turning the ignition switch to START			
	<input type="checkbox"/> While accelerating	—		km/h
		—		MPH
	<input type="checkbox"/> While driving at a constant speed	km/h	MPH	
	<input type="checkbox"/> While decelerating	—		km/h
		—		MPH
	<input type="checkbox"/> When turning to the right	Steering angle:	deg	
		Steering time:	Sec.	
	<input type="checkbox"/> When turning to the left	Steering angle:	deg	
Steering time:		Sec.		
<input type="checkbox"/> When other electrical parts are operating				
<ul style="list-style-type: none"> • Part name: • Operating condition: 				

3. STATE OF VDC OFF INDICATOR LIGHT



VDC OFF indicator light illuminates.	<input type="checkbox"/> Always <input type="checkbox"/> Sometimes <input type="checkbox"/> Only once <input type="checkbox"/> Does not illuminate <ul style="list-style-type: none"> • When/How long does it illuminate? 			
Ignition key position	<input type="checkbox"/> LOCK <input type="checkbox"/> ACC <input type="checkbox"/> ON (before starting engine) <input type="checkbox"/> START <input type="checkbox"/> ON (after starting engine, engine is running) <input type="checkbox"/> ON (after starting engine, engine is at a standstill)			
Timing	<input type="checkbox"/> Immediately after turning the ignition switch to ON <input type="checkbox"/> Immediately after turning the ignition switch to START			
	<input type="checkbox"/> While accelerating	—		km/h
		—		MPH
	<input type="checkbox"/> While driving at a constant speed	km/h	MPH	
	<input type="checkbox"/> While decelerating	—		km/h
—		MPH		

<input type="checkbox"/> When turning to the right	Steering angle:	deg
	Steering time:	Sec.
<input type="checkbox"/> When turning to the left	Steering angle:	deg
	Steering time:	Sec.
<input type="checkbox"/> When other electrical parts are operating		
• Part name:		
• Operating condition:		

4. CONDITIONS UNDER WHICH TROUBLE OCCURS



Environment	a) Weather	<input type="checkbox"/> Fine <input type="checkbox"/> Cloudy <input type="checkbox"/> Rainy <input type="checkbox"/> Snowy <input type="checkbox"/> Others:	
	b) Ambient temperature	°C (°F)	
	c) Road	<input type="checkbox"/> Inner city <input type="checkbox"/> Suburbs <input type="checkbox"/> Highway <input type="checkbox"/> Local street <input type="checkbox"/> Uphill <input type="checkbox"/> Downhill <input type="checkbox"/> Paved road <input type="checkbox"/> Gravel road <input type="checkbox"/> Muddy road <input type="checkbox"/> Sandy place <input type="checkbox"/> Straight road <input type="checkbox"/> Sharp curve <input type="checkbox"/> Gentle curve <input type="checkbox"/> S-curve <input type="checkbox"/> Road with a slope on both sides <input type="checkbox"/> Others:	
	d) Road surface	<input type="checkbox"/> Dry <input type="checkbox"/> Wet <input type="checkbox"/> Covered with fresh snow <input type="checkbox"/> Covered with hardened snow <input type="checkbox"/> Frozen slope <input type="checkbox"/> Others:	
Condition	a) Brakes	Deceleration:	G
		<input type="checkbox"/> continuous / <input type="checkbox"/> intermittent	
	b) Accelerator	Acceleration:	G
	<input type="checkbox"/> continuous / <input type="checkbox"/> intermittent		
	c) Vehicle speed	km/h	MPH

	<input type="checkbox"/> Advancing <input type="checkbox"/> While accelerating <input type="checkbox"/> While decelerating <input type="checkbox"/> At low speed <input type="checkbox"/> When turning <input type="checkbox"/> Others:
d) Tire inflation pressure	Front RH tire: kPa Front LH tire: kPa Rear RH tire: kPa Rear LH tire: kPa
e) Degree of wear	Front RH tire: mm (in) Front LH tire: mm (in) Rear RH tire: mm (in) Rear LH tire: mm (in)
f) Steering wheel	<input type="checkbox"/> Sharp turning <input type="checkbox"/> Gentle turning <input type="checkbox"/> Straight forward motion <input type="checkbox"/> Gentle return <input type="checkbox"/> Sharp return
g) Tire/Wheel size	<input type="checkbox"/> Specified size <input type="checkbox"/> Except specification ()
h) Tire variation	<input type="checkbox"/> Summer tire <input type="checkbox"/> Studless tire (brand:)
i) Tire chain is attached:	<input type="checkbox"/> Yes / <input type="checkbox"/> No
j) Using T-type tires:	<input type="checkbox"/> Yes / <input type="checkbox"/> No
k) Condition of suspension alignment:	
l) Load condition:	
m) Repaired parts are used:	<input type="checkbox"/> Yes / <input type="checkbox"/> No
• Content:	
n) Others:	

BRAKE CONTROL (DIAGNOSTICS) > Clear memory

OPERATION

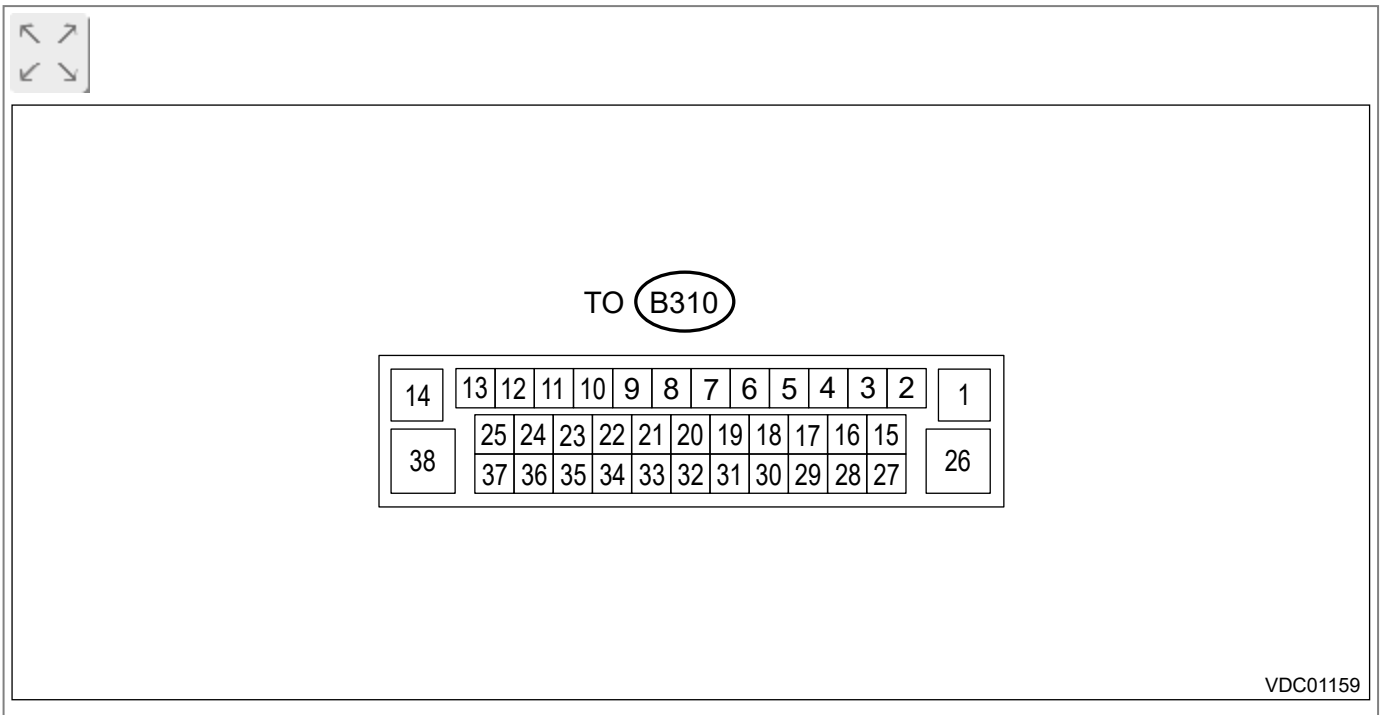
- 1.** On [Start] display, select [Diagnosis].
- 2.** On [Vehicle selection] display, enter vehicle information and select [OK].
- 3.** On [Main Menu] display, select [Each System].
- 4.** On [Select System] display, select [Brake Control].
- 5.** On [Select Function] display, select [DTC].
- 6.** On [DTC] display, select [Clear memory].

Note:

For detailed operation procedures, refer to “Application help”.

BRAKE CONTROL (DIAGNOSTICS) > Control Module I/O Signal

ELECTRICAL SPECIFICATION



Note:

- Terminal numbers in VDCCM&H/U connector (on the control module side) are shown in the figure.
- When the connector is removed from the VDCCM&H/U, the brake warning light (EBD warning light), ABS warning light, VDC warning light & VDC indicator light, VDC OFF indicator light, and the hill start assist warning light illuminate.

Content			Terminal No. (+) – (–)	Input/Output signal
				Measured value and measuring conditions
Power supply			4 – 14	10 – 15 V when the ignition switch is ON.
ABS wheel speed sensor	Front LH wheel	Power supply	20 – 14	0 – 18 V when the ignition switch is ON.
		Signal	33 (*1)	7 – 14 mA: Rectangle waveform
		Signal	8 (*2)	7 – 14 mA: Rectangle waveform
	Front RH wheel	Power supply	17 – 14	0 – 18 V when the ignition switch is ON.
		Signal	29	7 – 14 mA: Rectangle waveform
	Rear LH wheel	Power supply	7 – 14	0 – 18 V when the ignition switch is ON.
Signal		19	7 – 14 mA: Rectangle waveform	
Rear RH wheel	Power	18 –	0 – 18 V when the ignition switch is ON.	


	supply	14	
	Signal	5	7 – 14 mA: Rectangle waveform
CAN communication line (H)		2	Pulse signal
CAN communication line (L)		15	Pulse signal
Valve relay power supply		1 – 14	10 – 15 V
Motor relay power supply		26 – 38	10 – 15 V
Brake light relay power supply (model with X mode and model with EyeSight)		28 – 14	10 – 15 V when the ignition switch is ON.
Stop light switch		6 – 14	1.5 V or less when the stop light is OFF; 10 – 15 V when the stop light is ON.
Vehicle speed output signal		27	0 ↔ 12 V pulse
VDC OFF switch		37 – 14	1 Ω or less when the OFF switch is "ON"; 1 MΩ or more when the switch is "OFF".
Ground		14	—
Ground		38	—

*1: Models without EyeSight

*2: Models with EyeSight

BRAKE CONTROL (DIAGNOSTICS) > Control Module I/O Signal

WIRING DIAGRAM

Refer to "Vehicle Dynamics Control System" in the wiring diagram.  [Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1211 FRONT RIGHT ABS SENSOR CIRCUIT

Note:

For the diagnostic procedure, refer to "DTC C1241 REAR LEFT ABS SENSOR CIRCUIT".

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC C1241 REAR LEFT ABS SENSOR CIRCUIT.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1212 FRONT RIGHT ABS SENSOR SIGNAL

Note:

For the diagnostic procedure, refer to "DTC C1242 REAR LEFT ABS SENSOR SIGNAL".

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC C1242 REAR LEFT ABS SENSOR SIGNAL.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1221 FRONT LEFT ABS SENSOR CIRCUIT

Note:

For the diagnostic procedure, refer to "DTC C1241 REAR LEFT ABS SENSOR CIRCUIT".

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC C1241 REAR LEFT ABS SENSOR CIRCUIT.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1222 FRONT LEFT ABS SENSOR SIGNAL

Note:

For the diagnostic procedure, refer to "DTC C1242 REAR LEFT ABS SENSOR SIGNAL".

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC C1242 REAR LEFT ABS SENSOR SIGNAL.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1231 REAR RIGHT ABS SENSOR CIRCUIT

Note:

For the diagnostic procedure, refer to "DTC C1241 REAR LEFT ABS SENSOR CIRCUIT".

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC C1241 REAR LEFT ABS SENSOR CIRCUIT.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1232 REAR RIGHT ABS SENSOR SIGNAL

Note:

For the diagnostic procedure, refer to "DTC C1242 REAR LEFT ABS SENSOR SIGNAL".

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC C1242 REAR LEFT ABS SENSOR SIGNAL.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1241 REAR LEFT ABS SENSOR CIRCUIT

DTC detecting condition:

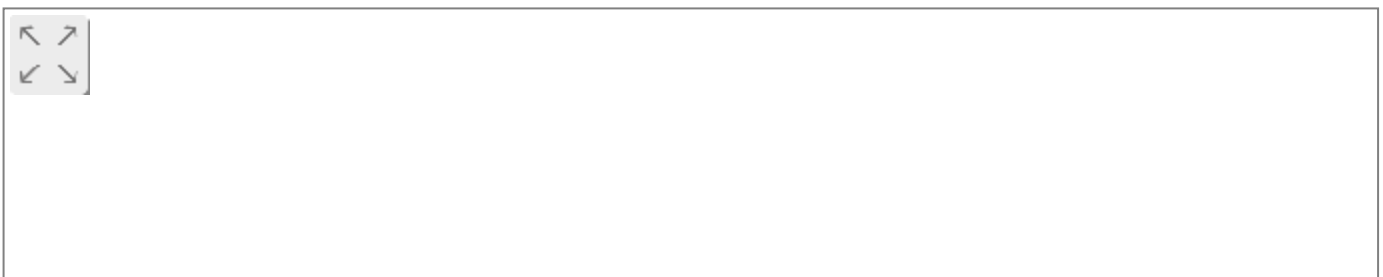
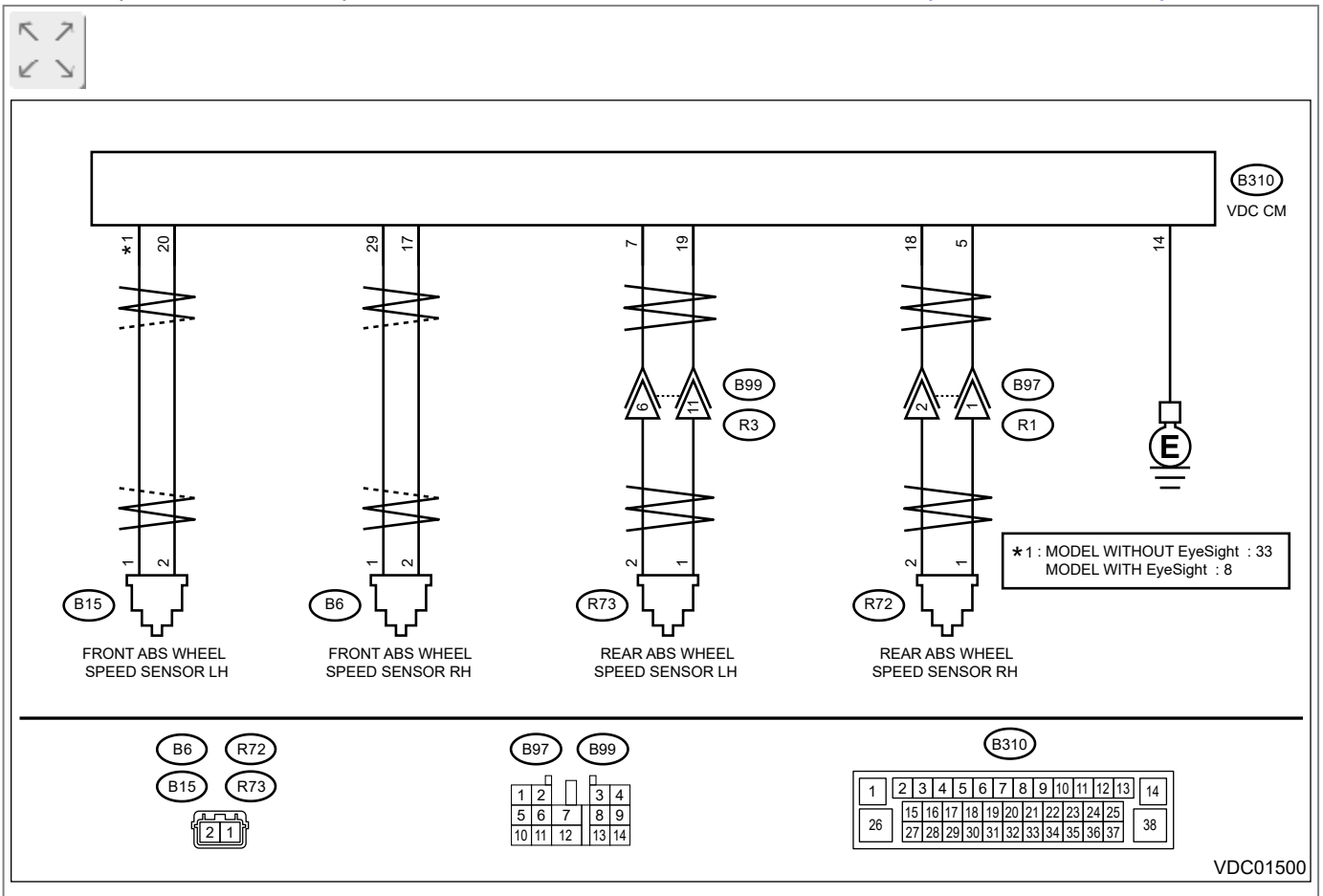
- Defective ABS wheel speed sensor (broken wire, input voltage too high)
- Defective harness connector

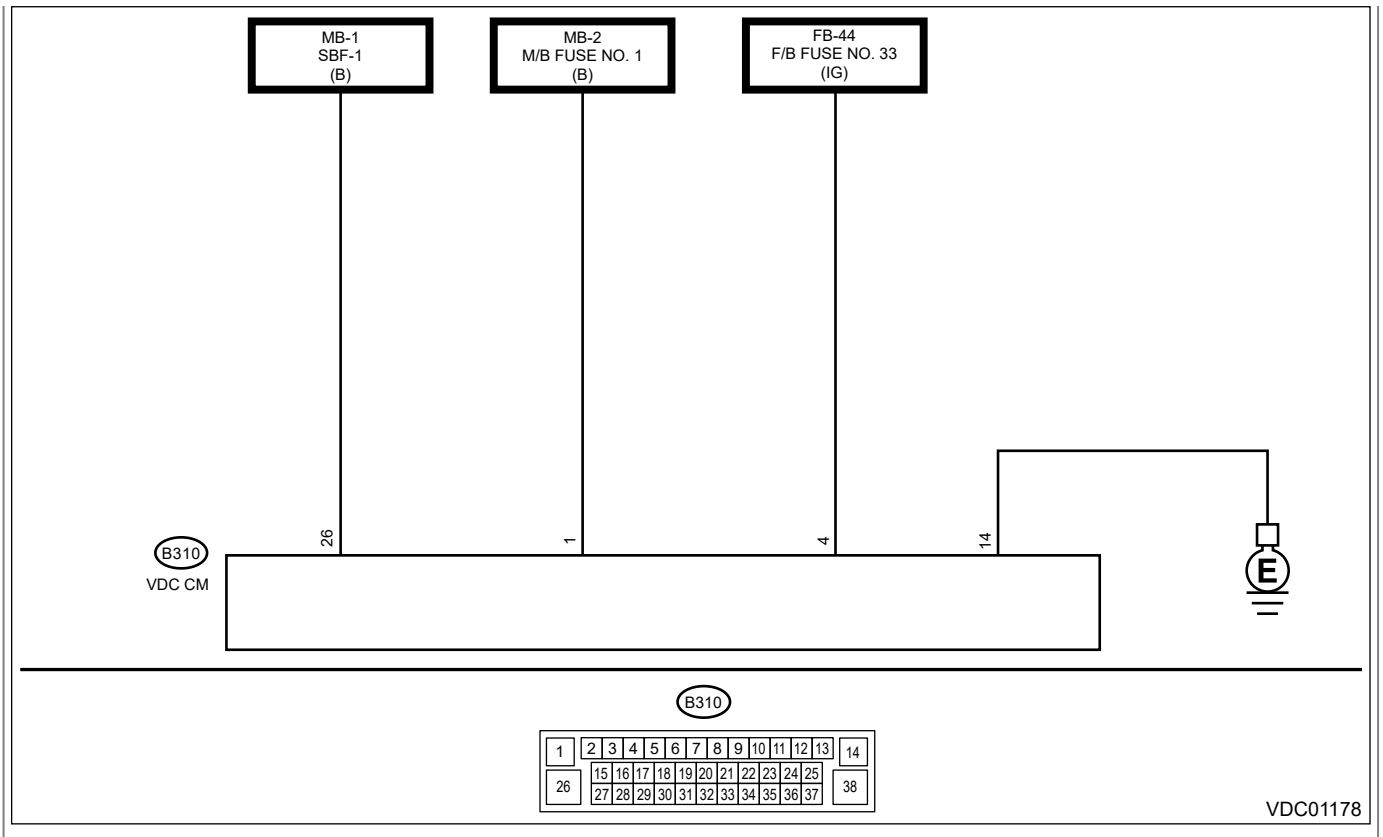
Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- Hill descent control does not operate. (Model with X mode)
- EyeSight does not operate. (Model with EyeSight)

Wiring diagram:

Vehicle dynamics control system  [Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.](#)





1. CHECK POOR CONTACT OF CONNECTOR. ▶

Check if there is poor contact between VDCCM&H/U and ABS wheel speed sensor.

Is there poor contact?

Yes

Repair the connector.

No

[Go to 2.](#)

2. CHECK HARNESS CONNECTOR BETWEEN VDCCM&H/U AND ABS WHEEL SPEED SENSOR (CHECK FOR OPEN CIRCUIT). ▶

1. Turn the ignition switch to OFF.
2. Disconnect the connector (B310) from the VDCCM&H/U.
3. Disconnect the connector from ABS wheel speed sensor.
4. Measure the resistance between VDCCM&H/U connector and ABS wheel speed sensor connector.

Connector & terminal

DTC C1211

(B310) No. 29 — (B6) No. 1:

(B310) No. 17 — (B6) No. 2:

DTC C1221

(B310) No. 33 — (B15) No. 1: (model without EyeSight)

(B310) No. 8 — (B15) No. 1: (model with EyeSight)

(B310) No. 20 — (B15) No. 2:

DTC C1231

(B310) No. 5 — (R72) No. 1:

(B310) No. 18 — (R72) No. 2:


DTC C1241

(B310) No. 19 — (R73) No. 1:

(B310) No. 7 — (R73) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the harness connector between VDCCM&H/U and ABS wheel speed sensor.

3. CHECK GROUND SHORT OF HARNESS.

Measure the resistance between VDCCM&H/U connector and chassis ground.

Connector & terminal

DTC C1211

(B310) No. 29 — Chassis ground:

DTC C1221

(B310) No. 33 — Chassis ground: (model without EyeSight)

(B310) No. 8 — Chassis ground: (model with EyeSight)

DTC C1231


(B310) No. 5 — Chassis ground:

DTC C1241

(B310) No. 19 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair the harness connector between VDCCM&H/U and ABS wheel speed sensor.

4. CHECK ABS WHEEL SPEED SENSOR POWER SUPPLY CIRCUIT.

1. Connect the VDCCM&H/U connector.

2. Connect the ABS wheel speed sensor connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between ABS wheel speed sensor connector and chassis ground.

Connector & terminal

DTC C1211

(B6) No. 2 (+) — Chassis ground (-):

DTC C1221

(B15) No. 2 (+) — Chassis ground (-):

DTC C1231


(R72) No. 2 (+) — Chassis ground (-):

DTC C1241


(R73) No. 2 (+) — Chassis ground (-):

Is the voltage 5 — 16 V?

Yes

 [Go to 6.](#)

No

 [Go to 5.](#)

5. CHECK VDCCM&H/U POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the VDCCM&H/U connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between VDCCM&H/U connector terminals.

Connector & terminal

(B310) No. 4 (+) — (B310) No. 14 (-):

(B310) No. 1 (+) — (B310) No. 14 (-):

(B310) No. 26 (+) — (B310) No. 14 (-):

Is the voltage 10 — 15 V?


Yes


 [Go to 6.](#)

No

Check the generator, battery and VDCCM&H/U power supply circuit.


6. CHECK ABS WHEEL SPEED SENSOR SIGNAL.

1. Prepare an oscilloscope.
2. Check the ABS wheel speed sensor.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Front ABS Wheel Speed Sensor>INSPECTION > CHECK ABS WHEEL SPEED](#)



[SENSOR UNIT.](#)  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Rear ABS Wheel Speed Sensor>INSPECTION > CHECK ABS WHEEL SPEED SENSOR UNIT.](#)

Is the pattern the same waveform as shown in the figure?




Yes

 [Go to 7.](#)

No


Replace the ABS wheel speed sensor.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Front ABS Wheel Speed Sensor.](#)  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Rear ABS Wheel Speed Sensor.](#)

7. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No


 [Go to 8.](#)

8. CHECK DETECTION OF OTHER DTCS FOR VDC.

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1242 REAR LEFT ABS SENSOR SIGNAL



DTC detecting condition:

- Defective ABS wheel speed sensor signal (noise, irregular signal, etc.)
- Defective harness connector

Trouble symptom:


- ABS does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- Hill descent control does not operate. (Model with X mode)
- EyeSight does not operate. (Model with EyeSight)

1. CHECK ABS WHEEL SPEED SENSOR AND FREEZE FRAME DATA USING SUBARU SELECT MONITOR.

1. Using the Subaru Select Monitor, check the freeze frame data when DTC is detected.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)
2. Compare [FR Wheel Speed], [FL Wheel Speed], [RR Wheel Speed] and [RL Wheel Speed] to determine a sensor that is not indicating the same value.
3. Check the data monitor of the wheel speed sensor that is not indicating the same value.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Does the speed indicated on the current data change in response to the speedometer reading during acceleration/deceleration when the steering wheel is in the straight-ahead position? And, are the values on the freeze frame data of the vehicle speed from the four wheels indicated as almost identical?

Yes

 [Go to 2.](#)

No

 [Go to 7.](#)

2. CHECK POOR CONTACT OF CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check for poor contact of the connector between VDCCM&H/U and ABS wheel speed sensor.

Is there poor contact of connectors between VDCCM&H/U and ABS wheel speed sensor?

Yes

Repair the connector.

No

 [Go to 3.](#)

3. CHECK CAUSE OF SIGNAL NOISE.

Make sure the radio wave devices and electronic components are installed correctly.

Are the radio wave devices and electronic components installed correctly?

Yes

 [Go to 4.](#)

No

Install the radio wave devices and electronic components properly.

4. CHECK CAUSE OF SIGNAL NOISE.

Check if the noise sources (such as an antenna) are installed near the sensor harness.

Are noise sources installed?




Yes

Install the noise sources apart from sensor harness.

No


 [Go to 5.](#)

5. CHECK VDCCM&H/U.


1. Connect all connectors.
2. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No


 [Go to 6.](#)

6. CHECK DETECTION OF OTHER DTCS FOR VDC.

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)


No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

7. CHECK INSTALLATION OF ABS WHEEL SPEED SENSOR.

Are the ABS wheel speed sensor installation bolts tightened to 7.5 N·m (0.76 kgf-m, 5.5 ft-lb)?



Yes

 [Go to 8.](#)

No

Tighten the ABS wheel speed sensor installation bolts.

8. CHECK ABS WHEEL SPEED SENSOR SIGNAL.

1. Prepare an oscilloscope.
2. Check the ABS wheel speed sensor.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Front ABS Wheel Speed Sensor>INSPECTION > CHECK ABS WHEEL SPEED SENSOR UNIT.](#)  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Rear ABS Wheel Speed Sensor>INSPECTION > CHECK ABS WHEEL SPEED SENSOR UNIT.](#)

Does the oscilloscope indicate the waveform pattern as shown in the figure when the tires are turning? Or does the oscilloscope indication repeat the waveform pattern like shown in the figure when the tire is slowly turned in equal speed for one rotation or more?

Yes

 [Go to 10.](#)

No

 [Go to 9.](#)


9. CHECK ABS WHEEL SPEED SENSOR OR MAGNETIC ENCODER.

Are there foreign matters adhered to the tip of ABS wheel speed sensor or magnetic encoder? Or is there any breakage or damage?

Yes

Remove dirt thoroughly. Also replace the ABS wheel speed sensor or magnetic encoder as a unit with hub unit bearing if it is broken or damaged.

No


 [Go to 10.](#)

10. CHECK CAUSE OF SIGNAL NOISE.

Make sure the radio wave devices and electronic components are installed correctly.

Are the radio wave devices and electronic components installed correctly?

Yes

 [Go to 11.](#)

No

Install the radio wave devices and electronic components properly.

11. CHECK CAUSE OF SIGNAL NOISE.

Check if the noise sources (such as an antenna) are installed near the sensor harness.

Are noise sources installed?




Yes

Install the noise sources apart from sensor harness.

No

 [Go to 12.](#)

12. CHECK VDCCM&H/U.


1. Connect all connectors.
2. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?


Yes

 [Go to 13.](#)

No



 [Go to 14.](#)

13. CHECK FREEZE FRAME DATA OF ABS WHEEL SPEED SENSOR USING SUBARU SELECT MONITOR.


1. Using the Subaru Select Monitor, select Freeze frame data.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)
2. Read the ABS wheel speed sensor output.

Is the ABS wheel speed sensor output different compared with other wheels?

Yes

Replace the ABS wheel speed sensor which has a difference.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Front ABS Wheel Speed Sensor.](#)  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Rear ABS Wheel Speed Sensor.](#)

No


Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

14. CHECK DETECTION OF OTHER DTCS FOR VDC.

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

Note:

Though the ABS warning light may remain on at this time, this is normal. Drive the vehicle at 60 km/h (37 MPH) or more in order to turn ABS warning light off. Be sure to drive the vehicle and check that the warning light goes off.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1251 WHEEL SPEED SENSOR SYSTEM

Note:

For the diagnostic procedure, refer to "DTC C1241 REAR LEFT ABS SENSOR CIRCUIT".

 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1241 REAR LEFT ABS SENSOR CIRCUIT.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1252 WHEEL SPEED SENSOR SIGNAL OF ONE OF THE WHEELS

DTC detecting condition:

- Defective ABS wheel speed sensor signal (noise, irregular signal, etc.)
- Defective magnetic encoder
- When a wheel is turned freely for a long time

Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- EBD may not operate.
- Hill start assist does not operate.
- Hill descent control does not operate. (Model with X mode)
- EyeSight does not operate. (Model with EyeSight)

Note:


Brake warning light comes on as well as ABS warning light when EBD does not operate.

1. WHETHER A WHEEL TURNED FREELY OR NOT.

Check if the wheels have been turned freely for one minute or more, such as when the vehicle is jacked-up, under full-lock cornering or when the wheels are not in contact with road surface.

Did the wheels turn freely?

Yes

VDC is normal. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)

Note:

This diagnostic trouble code may sometimes occur if the wheels turn freely for a long time, for example when the vehicle is towed or jacked-up, or when steering wheel is continuously turned all the way.

No


 [Go to 2.](#)

2. CHECK TIRE SPECIFICATIONS.

Turn the ignition switch to OFF.

Are the tire specifications correct?

Yes

 [Go to 3.](#)

No

Replace the tire.


3. CHECK WEAR OF TIRE.

Is the tire worn excessively?

Yes

Replace the tire.


No

 [Go to 4.](#)

4. CHECK TIRE INFLATION PRESSURE.

Is the tire pressure correct?

Yes

 [Go to 5.](#)


No

Adjust the tire pressure.

5. CHECK INSTALLATION OF ABS WHEEL SPEED SENSOR.

Are the ABS wheel speed sensor installation bolts tightened to 7.5 N·m (0.76 kgf-m, 5.5 ft-lb)? (Four wheels)



Yes

 [Go to 6.](#)

No

Tighten the ABS wheel speed sensor installation bolts.

6. CHECK ABS WHEEL SPEED SENSOR SIGNAL.

1. Prepare an oscilloscope.
2. Check the ABS wheel speed sensor.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Front ABS Wheel Speed Sensor>INSPECTION > CHECK ABS WHEEL SPEED SENSOR UNIT.](#)  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Rear ABS Wheel Speed Sensor>INSPECTION > CHECK ABS WHEEL SPEED SENSOR UNIT.](#)

Does the oscilloscope indicate the waveform pattern as shown in the figure when the tires are turning? Or does the oscilloscope indication repeat the waveform pattern like shown in the figure when the tire is slowly turned in equal speed for one rotation or more? (Four wheels)

Yes

 [Go to 8.](#)

No

 [Go to 7.](#)

7. CHECK ABS WHEEL SPEED SENSOR OR MAGNETIC ENCODER.

Are there foreign matters adhered to the tip of ABS wheel speed sensor or magnetic encoder? Or is there any breakage or damage? (Four wheels)




Yes

Remove dirt thoroughly. Also replace the ABS wheel speed sensor or magnetic encoder as a unit with hub unit bearing if it is broken or damaged.

No


 [Go to 8.](#)

8. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No


 [Go to 9.](#)

9. CHECK DETECTION OF OTHER DTCS FOR VDC.

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)


No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1311 FR HOLD VALVE


Note:

For the diagnostic procedure, refer to “DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION”.  Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1312 FR PRESSURE REDUCING VALVE


Note:

For the diagnostic procedure, refer to “DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION”.  Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1321 FL HOLD VALVE


Note:

For the diagnostic procedure, refer to “DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION”.  Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1322 FL PRESSURE REDUCING VALVE


Note:

For the diagnostic procedure, refer to “DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION”.  Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1331 RR HOLD VALVE


Note:

For the diagnostic procedure, refer to “DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION”.  Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1332 RR PRESSURE REDUCING VALVE


Note:

For the diagnostic procedure, refer to “DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION”.  Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1341 RL HOLD VALVE


Note:

For the diagnostic procedure, refer to “DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION”.  Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1342 RL PRESSURE REDUCING VALVE


Note:

For the diagnostic procedure, refer to “DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION”.  Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1351 NORMAL OPENING VALVE 1


Note:

For the diagnostic procedure, refer to “DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION”.  Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1352 NORMAL OPENING VALVE 2


Note:

For the diagnostic procedure, refer to “DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION”.  Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1361 NORMAL CLOSING VALVE 1

Note:

For the diagnostic procedure, refer to “DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION”.  Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1362 NORMAL CLOSING VALVE 2

DTC detecting condition:

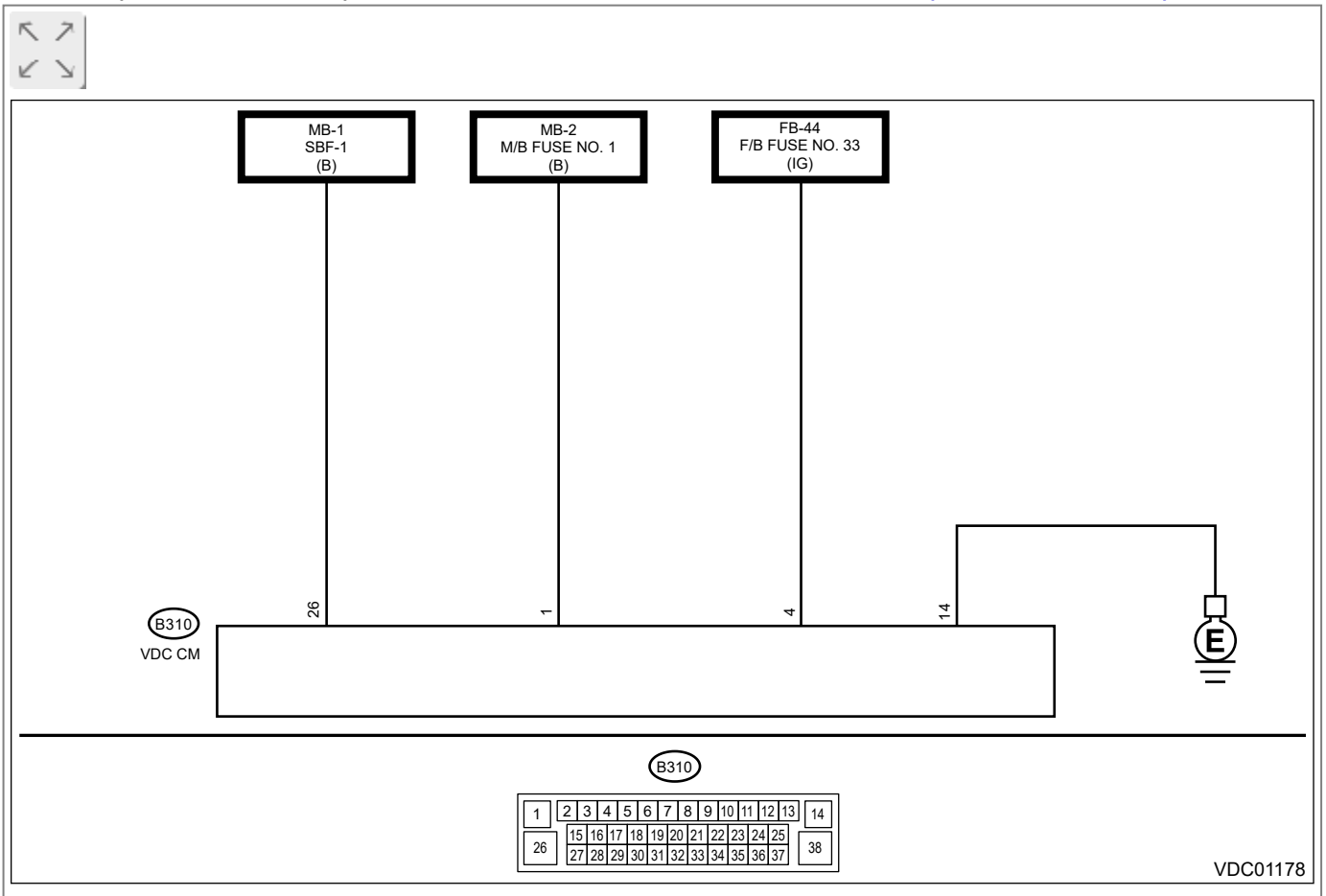
- Defective harness connector
- Defective VDCH/U solenoid valve

Trouble symptom:

- ABS does not operate.
- EBD does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- Hill descent control does not operate. (Model with X mode)
- EyeSight does not operate. (Model with EyeSight)

Wiring diagram:

Vehicle dynamics control system  Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.



1. CHECK VDCCM&H/U INPUT VOLTAGE.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the VDCCM&H/U.


3. Run the engine at idle.
4. Measure the voltage between VDCCM&H/U connector and chassis ground.

Connector & terminal

- (B310) No. 4 (+) — Chassis ground (-):
- (B310) No. 1 (+) — Chassis ground (-):
- (B310) No. 26 (+) — Chassis ground (-):

Is the voltage 10 — 15 V?

Yes

 [Go to 2.](#)

No

Repair the power supply circuit including the battery.

2. CHECK VDCCM&H/U GROUND CIRCUIT (CHECK FOR OPEN CIRCUIT).



1. Turn the ignition switch to OFF.
2. Measure the resistance between VDCCM&H/U connector and chassis ground.

Connector & terminal

- (B310) No. 14 — Chassis ground:

Is the resistance less than 10 Ω ?

Yes

 [Go to 3.](#)

No

Repair the VDCCM&H/U ground harness.

3. CHECK POOR CONTACT OF CONNECTORS.



Is there poor contact of connector between generator, battery and VDCCM&H/U?

Yes

Repair the connector.


No

 [Go to 4.](#)

4. CHECK VDCCM&H/U.




1. Connect all connectors.
2. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)

3. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)

4. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM&H/U.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\).](#)

No


 [Go to 5.](#)

5. CHECK DETECTION OF OTHER DTCS FOR VDC.

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1411 ELECTRICAL CONTROL MODULE

DTC detecting condition:

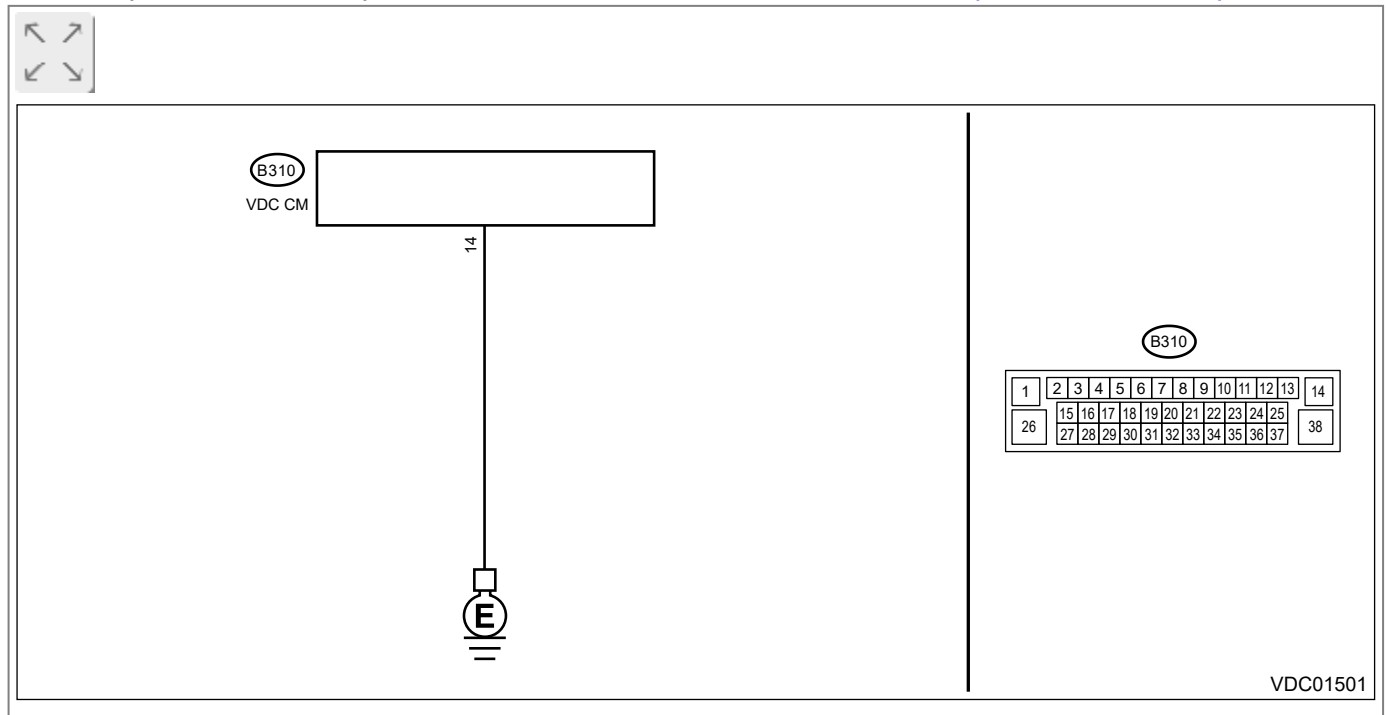
Defective VDCCM

Trouble symptom:

- ABS does not operate.
- EBD does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- Hill descent control does not operate. (Model with X mode)
- EyeSight does not operate. (Model with EyeSight)

Wiring diagram:

Vehicle dynamics control system  [Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.](#)



1. CHECK VDCCM&H/U GROUND CIRCUIT (CHECK FOR OPEN CIRCUIT).


1. Turn the ignition switch to OFF.
2. Disconnect the connector from the VDCCM&H/U.
3. Measure the resistance between VDCCM&H/U and chassis ground.

Connector & terminal

(B310) No. 14 — Chassis ground:

Is the resistance less than 10 Ω?

Yes

 [Go to 2.](#)

No

Repair the VDCCM&H/U ground harness.


2. CHECK POOR CONTACT OF CONNECTORS.

Is there poor contact of the connector between the battery, ignition switch and VDCCM&H/U?

Yes

Repair the connector.

No

 [Go to 3.](#)

3. CHECK CAUSE OF SIGNAL NOISE.

Are the radio wave devices and electronic components installed correctly?

Yes

 [Go to 4.](#)

No

Install the radio wave devices and electronic components properly.

4. CHECK CAUSE OF SIGNAL NOISE.

Is there a noise source (such as an antenna) installed near the sensor harness and VDCCM?




Yes

Install the noise sources apart from sensor harness and VDCCM.

No

 [Go to 5.](#)


5. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble](#)


[Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No

 [Go to 6.](#)


6. CHECK DETECTION OF OTHER DTCS FOR VDC.



 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1412 SELECTED PARAMETER

DTC detecting condition:

VDCCM parameter selection error

Trouble symptom:

- ABS does not operate.
- EBD does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- Hill descent control does not operate. (Model with X mode)
- EyeSight does not operate. (Model with EyeSight)

Note:

When the VDCCM or VDCCM&H/U is replaced, this DTC may be stored.

1. CHECK VDCCM&H/U IDENTIFICATION SYMBOL.

Check the identification symbol attached on the H/U. [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>General Description>SPECIFICATION.](#)

Is the identification symbol correct?

Yes

[Go to 2.](#)

No

Replace the VDCCM&H/U. [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\).](#)

2. CHECK PARAMETER SELECTED IN VDCCM.

[Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > PARAMETER CHECK.](#)

Does the parameter registered in the VDCCM match the relevant vehicle?

Yes

Replace the VDCCM&H/U. [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\).](#)

No

Select and register the correct parameter. [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > PARAMETER SELECTION.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1413 POWER SUPPLY VOLTAGE

DTC detecting condition:

Improper VDCCM&H/U power supply voltage

Trouble symptom:

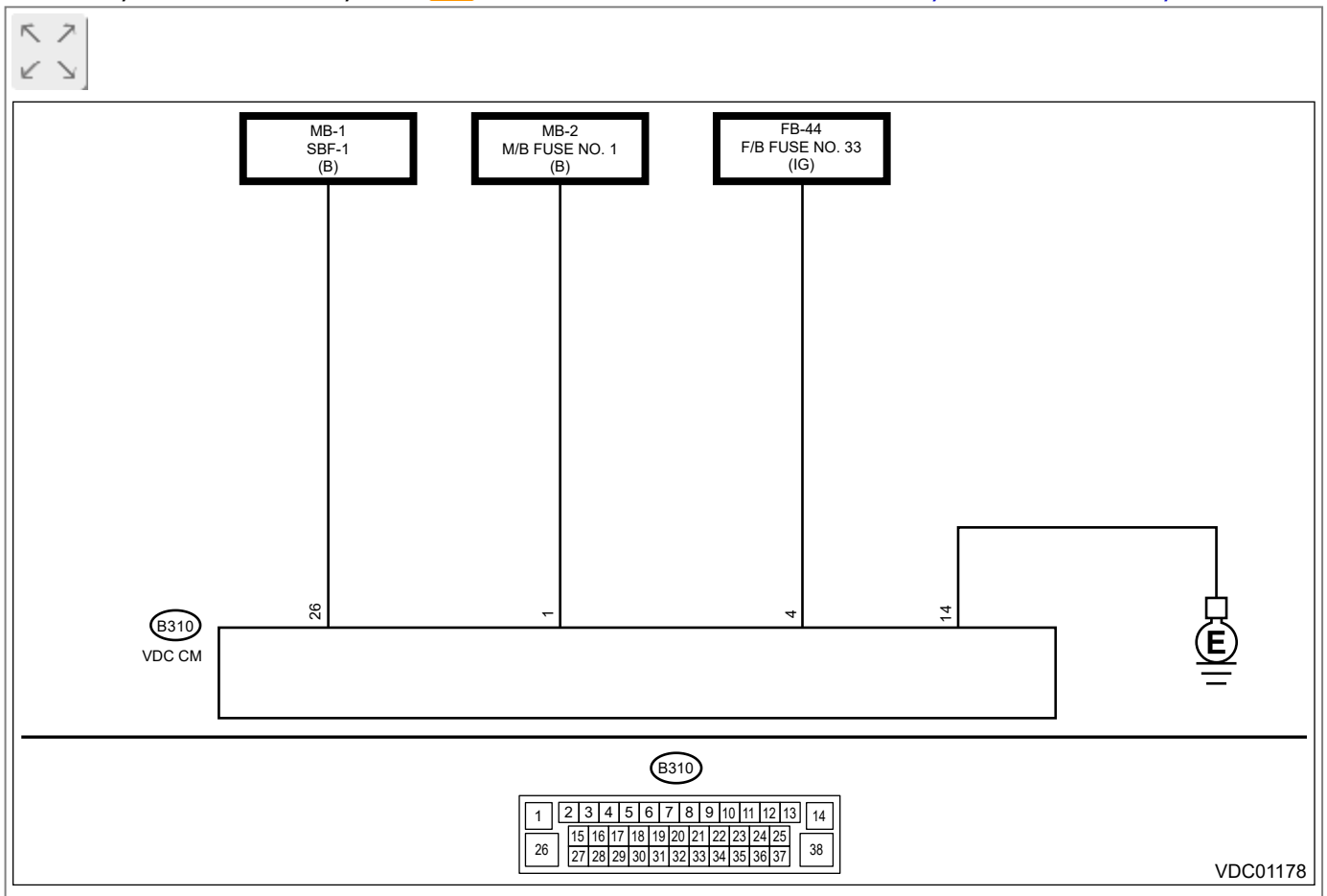
- ABS does not operate.
- EBD may not operate.
- VDC does not operate.
- Hill start assist does not operate.
- Hill descent control does not operate. (Model with X mode)
- EyeSight does not operate. (Model with EyeSight)

Note:

Warning lights go off if voltage returns.

Wiring diagram:

Vehicle dynamics control system  [Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.](#)



1. CHECK GENERATOR.

1. Start the engine.


2. Run the engine at idle after warming up.
3. Measure the voltage between generator terminal B and chassis ground.

Terminals

Generator terminal B (+) — Chassis ground (-):

Is the voltage 10 — 15 V?

Yes

 [Go to 2.](#)

No

Repair the generator.

2. CHECK BATTERY TERMINAL.



Turn the ignition switch to OFF.

Are the positive and negative battery terminals clamped tightly?

Yes

 [Go to 3.](#)

No

Tighten the terminal.

3. CHECK VDCCM&H/U INPUT VOLTAGE.



1. Disconnect the connector from the VDCCM&H/U.
2. Run the engine at idle.
3. Operate devices such as headlights, air conditioner, rear defogger, etc. which produce an electrical load.
4. Measure the voltage between VDCCM&H/U connector and chassis ground.

Connector & terminal

(B310) No. 4 (+) — Chassis ground (-):

(B310) No. 1 (+) — Chassis ground (-):

(B310) No. 26 (+) — Chassis ground (-):

Is the voltage 10 — 15 V?

Yes

 [Go to 4.](#)

No

Repair the power supply circuit.

4. CHECK VDCCM&H/U GROUND CIRCUIT (CHECK FOR OPEN CIRCUIT).




1. Turn the ignition switch to OFF.
2. Measure the resistance between VDCCM&H/U connector and chassis ground.

Connector & terminal

(B310) No. 14 — Chassis ground:

Is the resistance less than 10 Ω?

Yes

 [Go to 5.](#)

No

Repair the VDCCM&H/U ground harness.

5. CHECK POOR CONTACT OF CONNECTORS.




Is there poor contact of connector between generator, battery and VDCCM&H/U?

Yes




Repair the connector.

No

 [Go to 6.](#)


6. CHECK VDCCM&H/U.



1. Connect all connectors.
2. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No

 [Go to 7.](#)


7. CHECK DETECTION OF OTHER DTCS FOR VDC.



 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1422 VDC INTERRUPTION FOR ENGINE CONVENIENCE

DTC detecting condition:

ECM prohibits the cooperation control.


Trouble symptom:

VDC does not operate.

Note:

Warning lights go off if the cooperation control of ECM returns.

1. CHECK COOPERATION CONTROL FEASIBILITY OF ECM USING SUBARU SELECT MONITOR.

1. Start the engine, and run the engine at idle approximately 5 minutes.
2. Connecting the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
3. Check [E/G Control Stop Flag] on the display screen.

Is "1" displayed in [E/G Control Stop Flag]?

Yes

 [Go to 4.](#)

No


 [Go to 2.](#)

2. CHECK WARNING LIGHT.


Check whether the [VDC Warning Lamp] illuminates after driving for 1 minute or more at a speed of 10 km/h (6 MPH) or more.

Does the [VDC Warning Lamp] come on?

Yes

 [Go to 3.](#)

No

VDC is normal. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)

Note:

DTC may be recorded if cranking is performed during driving.

3. CHECK POOR CONTACT OF CONNECTORS.

Is there poor contact of ECM connector?



Yes

Repair the connector.

No



 [Go to 4.](#)

4. CHECK DTC CONCERNING ECM.

Read the DTC relating the ECM using the Subaru Select Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?




Yes

Perform the diagnosis according to DTC.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


 [Go to 5.](#)

5. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No


 [Go to 6.](#)

6. CHECK DETECTION OF OTHER DTCS FOR VDC.

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1423 DIFFERENT ECU SPECIFICATIONS

DTC detecting condition:

Different control module specification

Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- Hill descent control does not operate. (Model with X mode)
- EyeSight does not operate. (Model with EyeSight)

Note:

When parameter selection for VDCCM is improper, this DTC may be memorized.

1. CHECK VDCCM&H/U IDENTIFICATION SYMBOL.

Check the identification symbol attached on the H/U. [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>General Description>SPECIFICATION.](#)

Is the identification symbol correct?

Yes

[Go to 2.](#)

No

Replace the VDCCM&H/U. [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\).](#)

2. CHECK PARAMETER SELECTED IN VDCCM.

[Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > PARAMETER CHECK.](#)

Does the parameter registered in the VDCCM match the relevant vehicle?

Yes

CVT model: [Go to 3.](#)

MT model: [Go to 5.](#)

No

Select and register the correct parameter. [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > PARAMETER SELECTION.](#)

3. CHECK TCM SPECIFICATION.

Check the TCM specification.

Is the specification of TCM same as vehicle specification?

Yes

[Go to 4.](#)

No

Replace the TCM. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

4. CHECK CVT SYSTEM.

1. Start the engine.
2. Read the DTC of the CVT system. [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is DTC of CVT system displayed?

Yes

Perform the diagnosis according to DTC. [Ref. to TRANSMISSION \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 5.](#)

5. CHECK ECM SPECIFICATION.

Check the ECM specification.

Is the specification of ECM same as vehicle specification?



Yes

[Go to 6.](#)

No



Replace the ECM. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#) [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DQ\)>Engine Control Module \(ECM\).](#)

6. CHECK ENGINE SYSTEM.

1. Start the engine.
2. Read DTC of the engine system.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is engine system DTC displayed?




Yes

Perform the diagnosis according to DTC.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


 [Go to 7.](#)

7. CHECK VDCCM&H/U.

1. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
2. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
3. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No


 [Go to 8.](#)

8. CHECK DETECTION OF OTHER DTCS FOR VDC.

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1424 ECM

DTC detecting condition:

ECM malfunctioning

Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- Hill descent control does not operate. (Model with X mode)
- EyeSight does not operate. (Model with EyeSight)

1. CHECK ECM.

1. Start the engine.
2. Read the DTC of the ECM. [🔗 Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#) [🔗 Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes

Perform the diagnosis according to DTC. [🔗 Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#) [🔗 Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[🔗 Go to 2.](#)

2. CHECK VDCCM&H/U.

1. Clear the memory. [🔗 Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
2. Perform the Inspection Mode. [🔗 Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
3. Read the DTC. [🔗 Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only. [🔗 Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No

[🔗 Go to 3.](#)


3. CHECK DETECTION OF OTHER DTCS FOR VDC.



 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1431 AT

DTC detecting condition:

Defective TCM

Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- Hill descent control does not operate. (Model with X mode)
- EyeSight does not operate. (Model with EyeSight)

1. CHECK TCM.

1. Start the engine.
2. Read the DTC of the TCM. [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes

Perform the diagnosis according to DTC. [Ref. to TRANSMISSION \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 2.](#)

2. CHECK VDCCM&H/U.


1. Turn the ignition switch to OFF.
2. After turning the ignition switch to ON for approx. 10 seconds, turn it to OFF.
3. Turn the ignition switch to ON again.
4. Clear the memory. [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
5. Perform the Inspection Mode. [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
6. Read the DTC. [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only. [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No

 [Go to 3.](#)


3. CHECK DETECTION OF OTHER DTCS FOR VDC.



 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1432 DIFFERENT ECU SPECIFICATIONS

Note:

For the diagnostic procedure, refer to “DTC C1423 DIFFERENT ECU SPECIFICATIONS”.

 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1423 DIFFERENT ECU SPECIFICATIONS.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1441 EYESIGHT REQUEST PRESSURE ABNORMAL

DTC detecting condition:

Defective stereo camera

Trouble symptom:

EyeSight does not operate. (Model with EyeSight)

1. CHECK DTC DETECTION OF OTHER SYSTEM.

Is any other DTC displayed?


Yes

Perform the diagnosis according to DTC.

No


 [Go to 2.](#)

2. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is there any fault in LAN system?

Yes

Perform the diagnosis according to DTC for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 3.](#)


3. CHECK POOR CONTACT OF CONNECTORS.

Is there poor contact of the stereo camera connector?


Yes

Repair the connector.

No

 [Go to 4.](#)

4. CHECK STEREO CAMERA.

Perform the diagnosis for the EyeSight system.  [Ref. to EyeSight \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is the stereo camera normal?




Yes

 [Go to 5.](#)

No


Check the EyeSight system.

5. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1511 VALVE RELAY

DTC detecting condition:

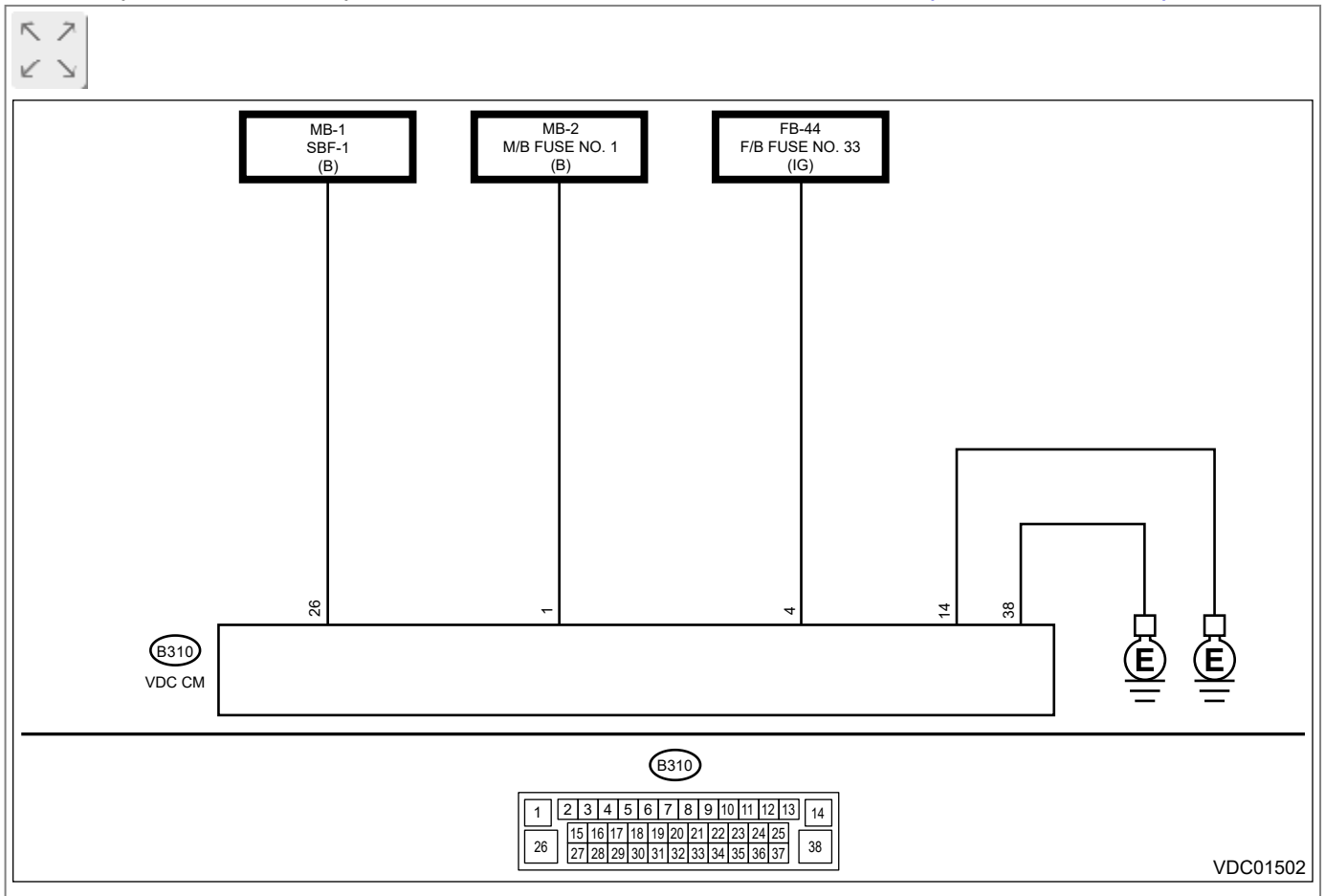
Defective valve relay

Trouble symptom:

- ABS does not operate.
- EBD does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- Hill descent control does not operate. (Model with X mode)
- EyeSight does not operate. (Model with EyeSight)

Wiring diagram:

Vehicle dynamics control system  [Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.](#)



1. CHECK VDCCM&H/U INPUT VOLTAGE.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the VDCCM&H/U.
3. Run the engine at idle.

4. Measure the voltage between VDCCM&H/U connector and chassis ground.


Connector & terminal

(B310) No. 1 (+) — Chassis ground (-):

(B310) No. 4 (+) — Chassis ground (-):

Is the voltage 10 — 15 V?

Yes

 [Go to 2.](#)

No

Repair the power supply circuit.

2. CHECK VDCCM&H/U INPUT VOLTAGE.

Calculate the voltage difference measured in step 1.

A: (B310) No. 1 (+) — Chassis ground (-):

B: (B310) No. 4 (+) — Chassis ground (-):

Is the voltage difference between A and B 2 V or more?

Yes

Repair the power supply circuit.

No

 [Go to 3.](#)

3. CHECK VDCCM&H/U GROUND CIRCUIT (CHECK FOR OPEN CIRCUIT).

1. Turn the ignition switch to OFF.

2. Measure the resistance between VDCCM&H/U connector and chassis ground.

Connector & terminal

(B310) No. 14 — Chassis ground:

Is the resistance less than 10 Ω ?

Yes

 [Go to 4.](#)

No

Repair the VDCCM&H/U ground harness.

4. CHECK POOR CONTACT OF CONNECTORS.

Is there poor contact of connector between generator, battery and VDCCM&H/U?




Yes

Repair the connector.

No


 [Go to 5.](#)

5. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No


 [Go to 6.](#)

6. CHECK DETECTION OF OTHER DTCS FOR VDC.

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)


No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1512 VALVE SYSTEM

Note:

For the diagnostic procedure, refer to “DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION”.  Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1521 MOTOR RELAY

DTC detecting condition:

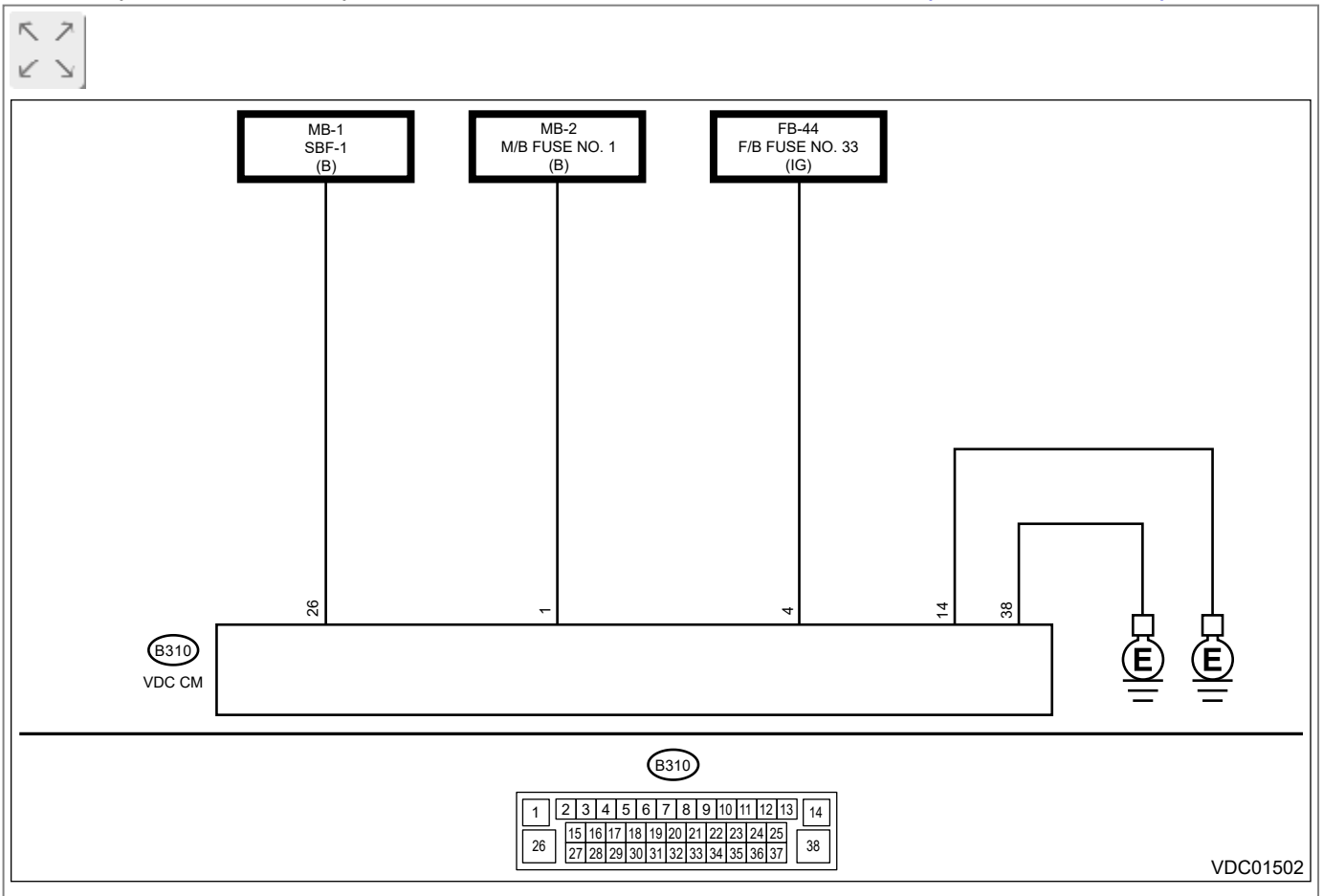
- Defective motor and motor relay
- Defective harness connector

Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- EBD may not operate.
- Hill start assist does not operate.
- Hill descent control does not operate. (Model with X mode)
- EyeSight does not operate. (Model with EyeSight)

Wiring diagram:

Vehicle dynamics control system  Ref. to [WIRING SYSTEM>Vehicle Dynamics Control System.](#)



1. CHECK VDCCM&H/U INPUT VOLTAGE.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the VDCCM&H/U.

3. Turn the ignition switch to ON.
4. Measure the voltage between VDCCM&H/U connector and chassis ground.

Connector & terminal

(B310) No. 4 (+) — Chassis ground (-):

(B310) No. 26 (+) — Chassis ground (-):

Is the voltage 10 — 15 V?

Yes

 [Go to 2.](#)

No

Repair the VDCCM&H/U power supply circuit.

2. CHECK VDCCM&H/U INPUT VOLTAGE.



Calculate the voltage difference measured in step 1.

A: (B310) No. 4 (+) — Chassis ground (-):


B: (B310) No. 26 (+) — Chassis ground (-):

Is the voltage difference between A and B 2 V or more?

Yes

Repair the power supply circuit.

No

 [Go to 3.](#)

3. CHECK INSTALLATION OF VDCCM&H/U GROUND.



Is the VDCCM&H/U ground terminal installation bolt (ground bolt fixing onto the side frame upper face) installed correctly?

Yes

 [Go to 4.](#)

No

Install the VDCCM&H/U ground terminal installation bolt correctly.

4. CHECK VDCCM&H/U GROUND CIRCUIT (CHECK FOR OPEN CIRCUIT).



1. Turn the ignition switch to OFF.
2. Measure the resistance between VDCCM&H/U connector and chassis ground.


Connector & terminal

(B310) No. 14 — Chassis ground:

(B310) No. 38 — Chassis ground:

Is the resistance less than 10 Ω ?

Yes

 [Go to 5.](#)

No

Repair the VDCCM&H/U ground harness.

5. CHECK VDCCM&H/U MOTOR RELAY.



Measure the resistance between VDCCM&H/U terminals.

Terminals


No. 26 —No. 38:

Is the resistance 1 M Ω or more?

Yes

 [Go to 6.](#)

No

Replace the VDCCM&H/U.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\).](#)

6. CHECK POOR CONTACT OF CONNECTORS.




Turn the ignition switch to OFF.

Is there poor contact of connector between generator, battery and VDCCM&H/U?

Yes




Repair the connector.

No

 [Go to 7.](#)


7. CHECK VDCCM&H/U.




1. Connect all connectors.
2. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM&H/U.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\).](#)

No

 [Go to 8.](#)


8. CHECK DETECTION OF OTHER DTCS FOR VDC.



 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1531 BLS OFF STUCK

DTC detecting condition:

Defective stop light switch

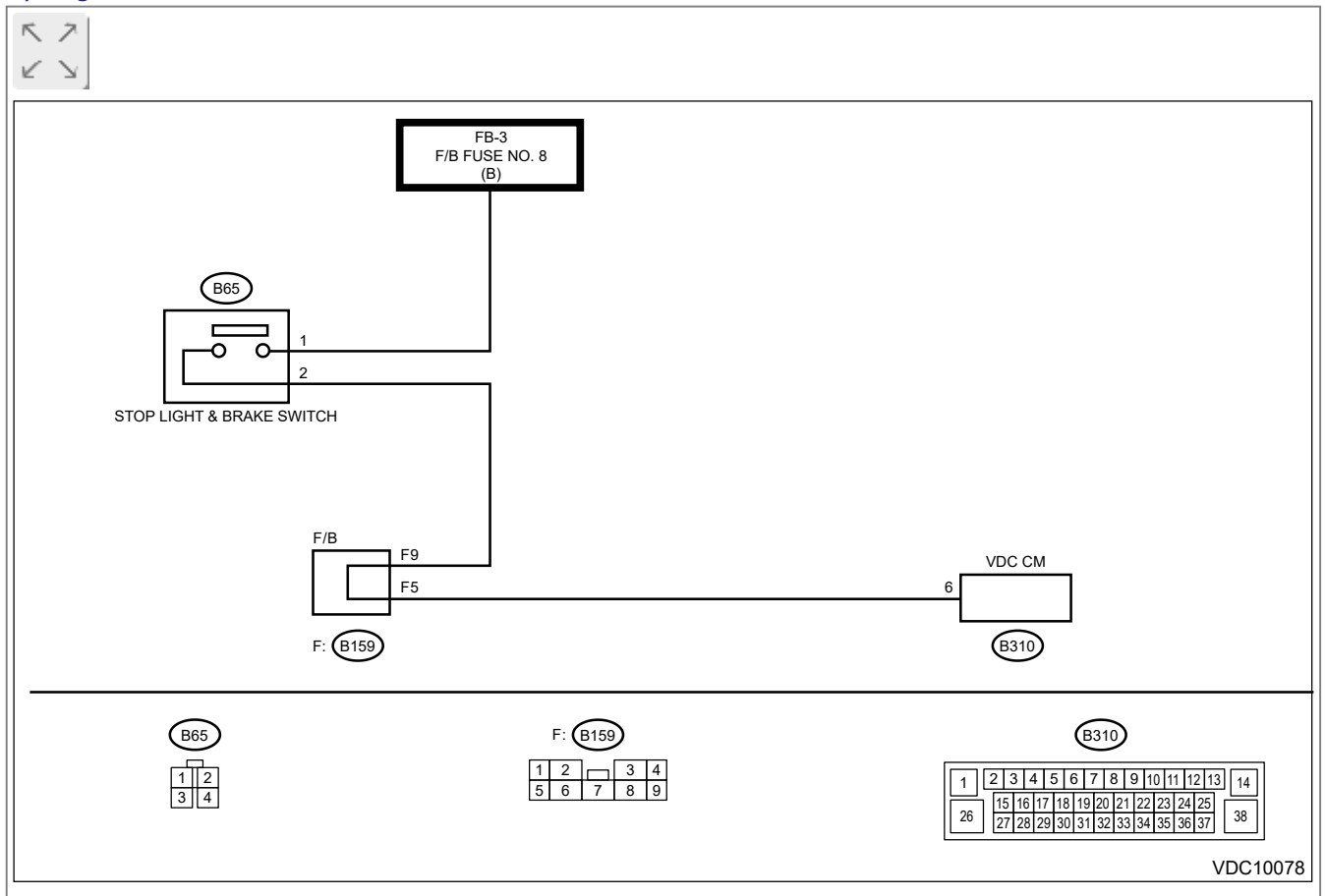
Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- Hill descent control does not operate. (Model with X mode)
- EyeSight does not operate. (Model with EyeSight)


1. NON-TURBO MODEL (WITHOUT EyeSight AND X MODE)

WIRING DIAGRAM:

Stop light system  [Ref. to WIRING SYSTEM>Stop Light System>WIRING DIAGRAM > WITHOUT EyeSight AND X MODE.](#)



1. CHECK STOP LIGHT SWITCH.


1. Check the stop light switch.  [Ref. to BRAKE>Stop Light Switch>INSTALLATION.](#)

Is the installation position of the stop light switch correct?

Yes

 [Go to 2.](#)

No

Adjust the installation position of the stop light switch.  [Ref. to BRAKE>Stop Light Switch>INSTALLATION.](#)

2. CHECK STOP LIGHT SWITCH.

1. Turn the ignition switch to OFF.
2. Disconnect the stop light switch connector.
3. Measure the resistance of stop light switch terminals.

Terminals

No. 1 —No. 2:

Is the resistance 1 Ω or less when the stop light switch is ON (when pedal is depressed)?

Yes

 [Go to 3.](#)

No

Replace the stop light switch.  [Ref. to BRAKE>Stop Light Switch.](#)

3. CHECK STOP LIGHT POWER SUPPLY.

Measure the voltage between stop light switch terminal and chassis ground.

Connector & terminal

(B65) No. 1 (+) — Chassis ground (—):

Is the voltage 10 — 15 V?

Yes

 [Go to 4.](#)

No

Repair the stop light power supply circuit.

4. CHECK STOP LIGHT SWITCH HARNESS (CHECK FOR OPEN CIRCUIT).

1. Disconnect the connector from the VDCCM&H/U.
2. Measure the resistance between VDCCM&H/U and stop light switch.

Connector & terminal

(B65) No. 2 — (B310) No. 6:

Is the resistance less than 1 Ω ?



Yes

 [Go to 5.](#)

No

Repair the stop light switch circuit.

5. CHECK POOR CONTACT OF CONNECTORS.

Is there poor contact of connector between stop light switch and VDCCM&H/U?




Yes

Repair the connector.

No


 [Go to 6.](#)

6. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No


 [Go to 7.](#)

7. CHECK DETECTION OF OTHER DTCS FOR VDC.

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

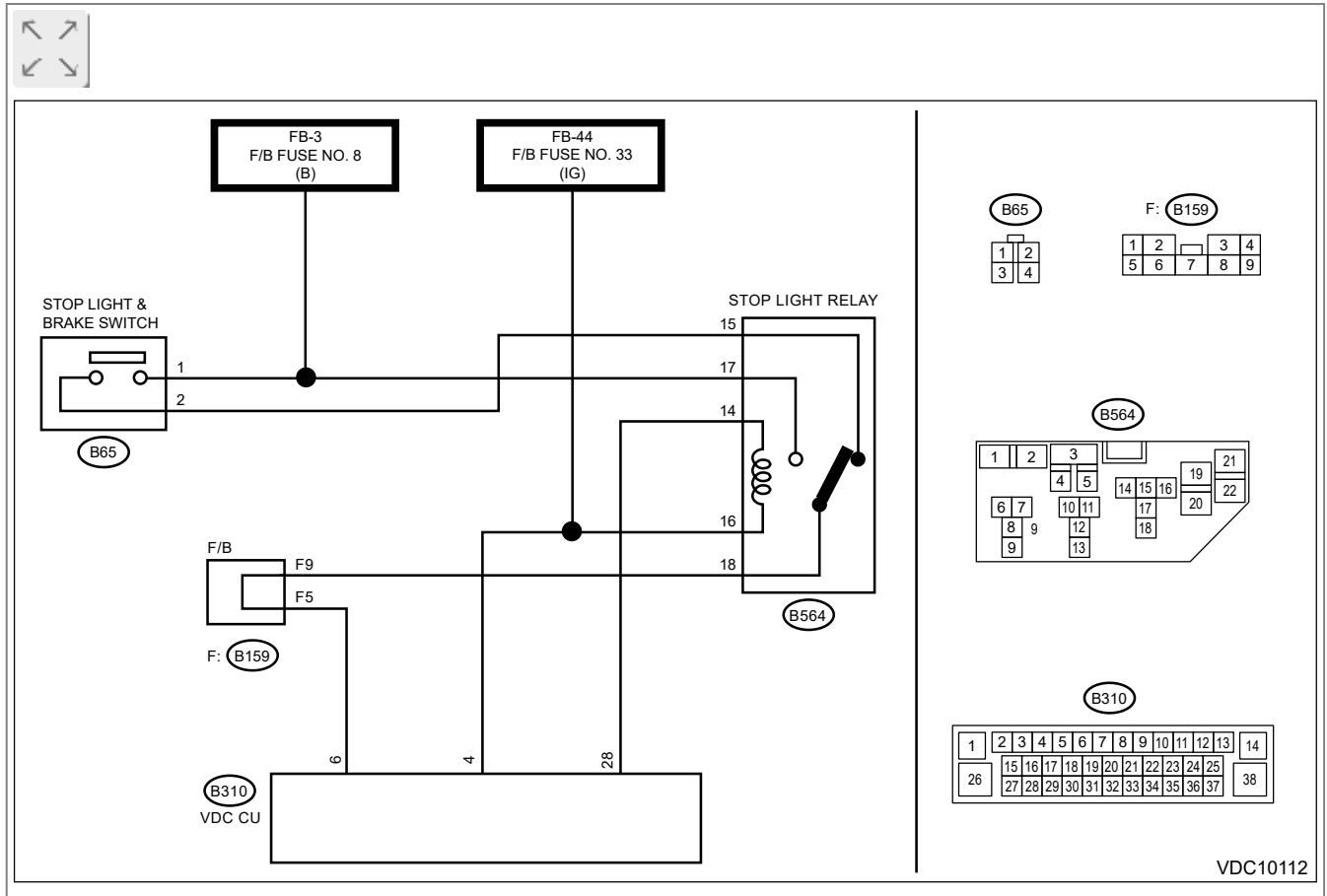
No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.


2. EXCEPT FOR NON-TURBO MODEL (WITHOUT EyeSight AND X MODE)

WIRING DIAGRAM:

Stop light system  Ref. to [WIRING SYSTEM>Stop Light System>WIRING DIAGRAM > EXCEPT FOR MODEL WITHOUT EyeSight AND X MODE.](#)



1. CHECK STOP LIGHT SWITCH.


1. Check the stop light switch.  Ref. to [BRAKE>Stop Light Switch>INSTALLATION.](#)

Is the check result OK?

Yes

 [Go to 2.](#)

No

Adjust the installation position of the stop light switch.  Ref. to [BRAKE>Stop Light Switch>INSTALLATION.](#)

2. CHECK STOP LIGHT SWITCH.


- 1.** Disconnect the stop light switch connector.
- 2.** Measure the resistance of stop light switch terminals.

Terminals

No. 1 —No. 2:

Is the resistance less than 1 Ω when the stop light switch is ON (when pedal is depressed)?

Yes

 [Go to 3.](#)

No

Replace the stop light switch.  [Ref. to BRAKE>Stop Light Switch.](#)

3. CHECK STOP LIGHT RELAY.



Measure the resistance of stop light relay terminals.

Terminals

No. 15 —No. 18:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Replace the stop light relay.

4. CHECK VDCCM&H/U CONNECTOR.



Disconnect the connector from the VDCCM&H/U.

Is there poor contact or damage of the VDCCM&H/U connector?

Yes

Repair the VDCCM&H/U connector.

No

 [Go to 5.](#)

5. CHECK STOP LIGHT SWITCH CIRCUIT (CHECK FOR OPEN CIRCUIT).



Measure the resistance of stop light switch circuit.

Connector & terminal

(B310) No. 6 — (B564) No. 18:

(B65) No. 2 — (B564) No. 15:

(B65) No. 1 — (F/B fuse) No. 8:

Is the resistance less than 1 Ω ?



 [Go to 6.](#)

Yes

No

Repair the stop light switch circuit.

6. CHECK STOP LIGHT SWITCH CIRCUIT.


1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between brake light relay and chassis ground.

Connector & terminal

(B564) No. 18 (+) — Chassis ground (-):

Is the voltage 10 V or more when the stop light switch is ON (when pedal is depressed)?




Yes

 [Go to 7.](#)

No


Repair the stop light switch circuit.

7. CHECK VDCCM&H/U.

1. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
2. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
3. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No


 [Go to 8.](#)

8. CHECK DETECTION OF OTHER DTCS FOR VDC.

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1532 BLS ON STUCK

DTC detecting condition:

Defective stop light switch

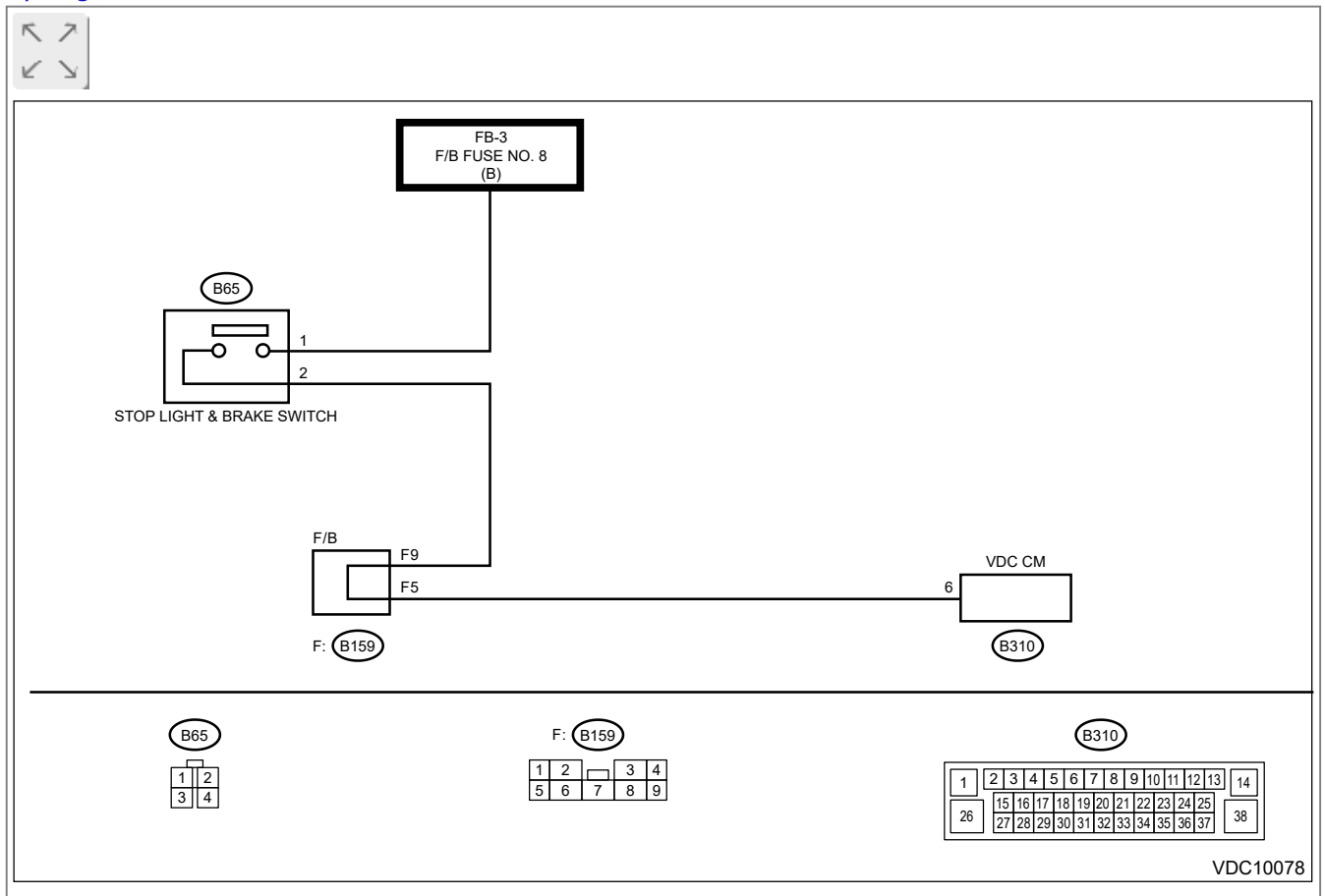
Trouble symptom:

- ABS does not operate sometimes.
- VDC does not operate sometimes.
- Hill start assist does not operate.
- Hill descent control does not operate sometimes. (Model with X mode)
- EyeSight does not operate sometimes. (Model with EyeSight)

1. NON-TURBO MODEL (WITHOUT EyeSight AND X MODE)

WIRING DIAGRAM:

Stop light system  Ref. to [WIRING SYSTEM>Stop Light System>WIRING DIAGRAM > WITHOUT EyeSight AND X MODE.](#)



1. INTERVIEW CUSTOMERS.

Make sure that the operation was performed in which accelerator pedal and brake pedal were depressed simultaneously (with depressing brake pedal with left foot).

Were the acceleration pedal and brake pedal depressed simultaneously?

Yes

System is normal. (DTC may be recorded if the brake pedal is always depressed while driving.)

No

 [Go to 2.](#)

2. CHECK STOP LIGHT SWITCH.

1. Turn the ignition switch to OFF.
2. Disconnect the stop light switch connector.
3. Measure the resistance of stop light switch terminals.

Terminals

No. 1 —No. 2:

Is the resistance 1 M Ω or more when stop light switch is OFF (when pedal is not depressed)?

Yes

 [Go to 3.](#)

No

Replace the stop light switch.  [Ref. to BRAKE>Stop Light Switch.](#)

3. CHECK STOP LIGHT SWITCH HARNESS.

1. Disconnect the connector from the VDCCM&H/U.
2. Measure the resistance between VDCCM&H/U connector and chassis ground.

Connector & terminal

(B310) No. 6 — Chassis ground:

Is the resistance 1 M Ω or more?




Yes

 [Go to 4.](#)

No

Repair the stop light switch circuit.


4. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble](#)

[Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No


 [Go to 5.](#)

5. CHECK DETECTION OF OTHER DTCS FOR VDC.

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

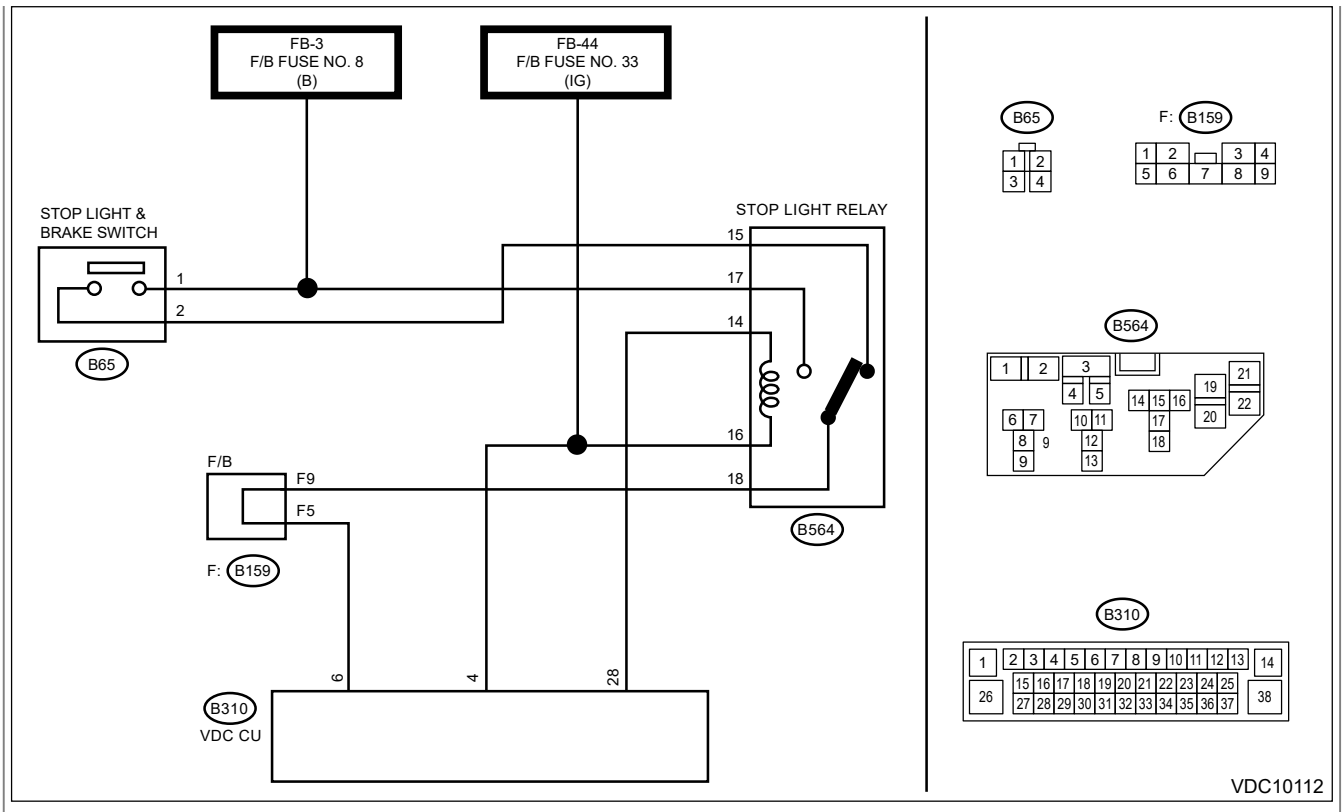
Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

2. EXCEPT FOR NON-TURBO MODEL (WITHOUT EyeSight AND X MODE)

WIRING DIAGRAM:

Stop light system  [Ref. to WIRING SYSTEM>Stop Light System>WIRING DIAGRAM > EXCEPT FOR MODEL WITHOUT EyeSight AND X MODE.](#)





1. INTERVIEW CUSTOMERS.

Make sure that the operation was performed in which accelerator pedal and brake pedal were depressed simultaneously (with depressing brake pedal with left foot).

Were the acceleration pedal and brake pedal depressed simultaneously?

Yes

System is normal. (DTC may be recorded if the brake pedal is always depressed while driving.)

No

 [Go to 2.](#)

2. CHECK STOP LIGHT RELAY.

1. Turn the ignition switch to OFF.
2. Measure the resistance of stop light relay terminals.

Terminals


No. 17 —No. 18:

Is the resistance less than 1 Ω ?

Yes

Replace the stop light relay.

No

 [Go to 3.](#)

3. CHECK VDCCM&H/U CONNECTOR.

Disconnect the connector from the VDCCM&H/U.

Is there poor contact or damage of the VDCCM&H/U connector?

Yes

Repair the VDCCM&H/U connector.

No

 [Go to 4.](#)

4. CHECK STOP LIGHT SWITCH CIRCUIT.

1. Turn the ignition switch to ON.
2. Measure the voltage between stop light switch and chassis ground.

Connector & terminal

(B564) No. 18 (+) — Chassis ground (–):

Is the voltage 10 V or more when the stop light switch is OFF (when pedal is not depressed)?




Yes

Repair the stop light switch circuit.

No


 [Go to 5.](#)

5. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No


 [Go to 6.](#)

6. CHECK DETECTION OF OTHER DTCS FOR VDC.

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)


No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1541 CLUTCH OFF FAULT

Note:

For the diagnostic procedure, refer to "DTC C1542 CLUTCH ON FAULT".  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC C1542 CLUTCH ON FAULT.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1542 CLUTCH ON FAULT

DTC detecting condition:

Abnormal clutch signal

Trouble symptom:

Hill start assist does not operate.

Note:

Depending on the user clutch operation patterns, the hill start assist warning light may illuminate for a while, and then go off.

Illumination condition:


While the vehicle speed is 10 km/h (6 MPH) or above, and the clutch switch signal ON (depressed) condition continues five minutes or more, if the vehicle speed lowers to 10 km/h (6 MPH) or below, the module judges as abnormal (clutch switch stuck ON), and then turns on the warning light.

Turning off condition:

If the clutch switch signal OFF (foot released) condition continues for 2 seconds, the module turns off the warning light.

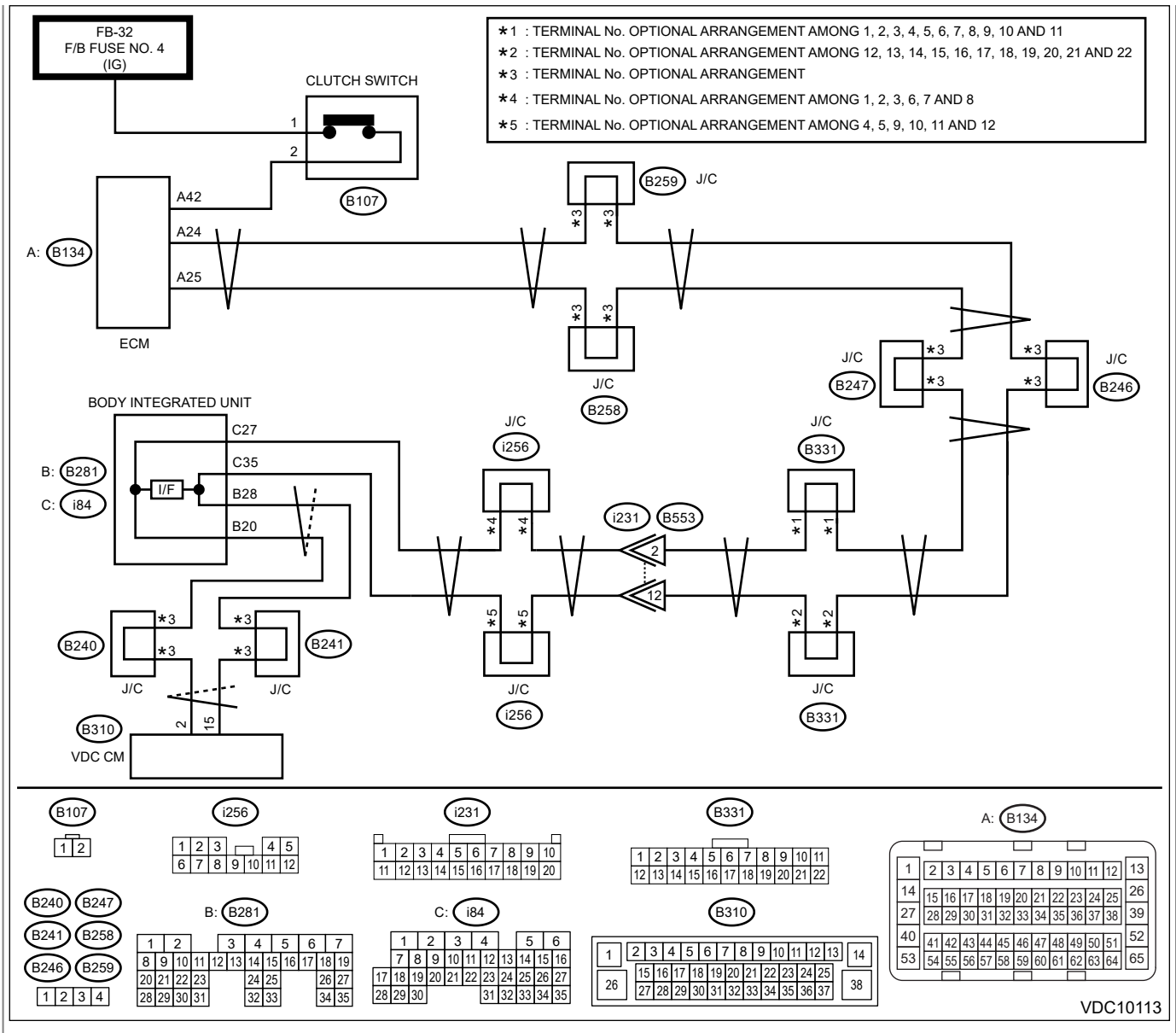
The hill start assist function does not operate, while the warning light illuminates.

Wiring diagram:

Engine electrical system  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM > NON-TURBO MODEL \(WITHOUT PUSH BUTTON START\).](#)

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM > NON-TURBO MODEL.](#)





1. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is there any fault in LAN system?


Yes

Perform the diagnosis according to DTC for LAN system. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 2.](#)

2. CHECK CLUTCH SIGNAL USING SUBARU SELECT MONITOR.

1. Using the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
2. Read [Clutch switch] indicated on the display screen.

Is "OFF" displayed when the clutch pedal is not depressed, and is "ON" displayed when depressed?


Yes

 [Go to 5.](#)

No

 [Go to 3.](#)

3. CHECK CLUTCH SIGNAL OF ECM USING SUBARU SELECT MONITOR.

1. Using the Subaru Select Monitor, select Data monitor in ECM.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
2. Read [Clutch switch] indicated on the display screen.

Is "OFF" displayed when the clutch pedal is not depressed, and is "ON" displayed when depressed?

Yes

 [Go to 5.](#)

No

 [Go to 4.](#)

4. CHECK HARNESS BETWEEN ECM AND CLUTCH SWITCH (CHECK FOR OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from ECM and clutch switch.
3. Measure the resistance of harness between ECM and clutch switch connector.


Connector & terminal

(B134) No. 42 — (B107) No. 2:

Is the resistance less than 1 Ω ?

Yes




Repair the power supply circuit of clutch switch. Or replace the clutch switch.

 [Ref. to CLUTCH SYSTEM>Clutch Switch.](#)

No


Repair the harness between ECM and clutch switch connector.

5. CHECK VDCCM&H/U.


1. Connect all connectors.
2. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No


 [Go to 6.](#)

6. CHECK DETECTION OF OTHER DTCS FOR VDC.

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)


No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1561 REVERSE OFF FAULT

Note:

For the diagnostic procedure, refer to "DTC C1562 REVERSE ON FAULT".  Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1562 REVERSE ON FAULT.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1562 REVERSE ON FAULT


DTC detecting condition:


Abnormal reverse signal

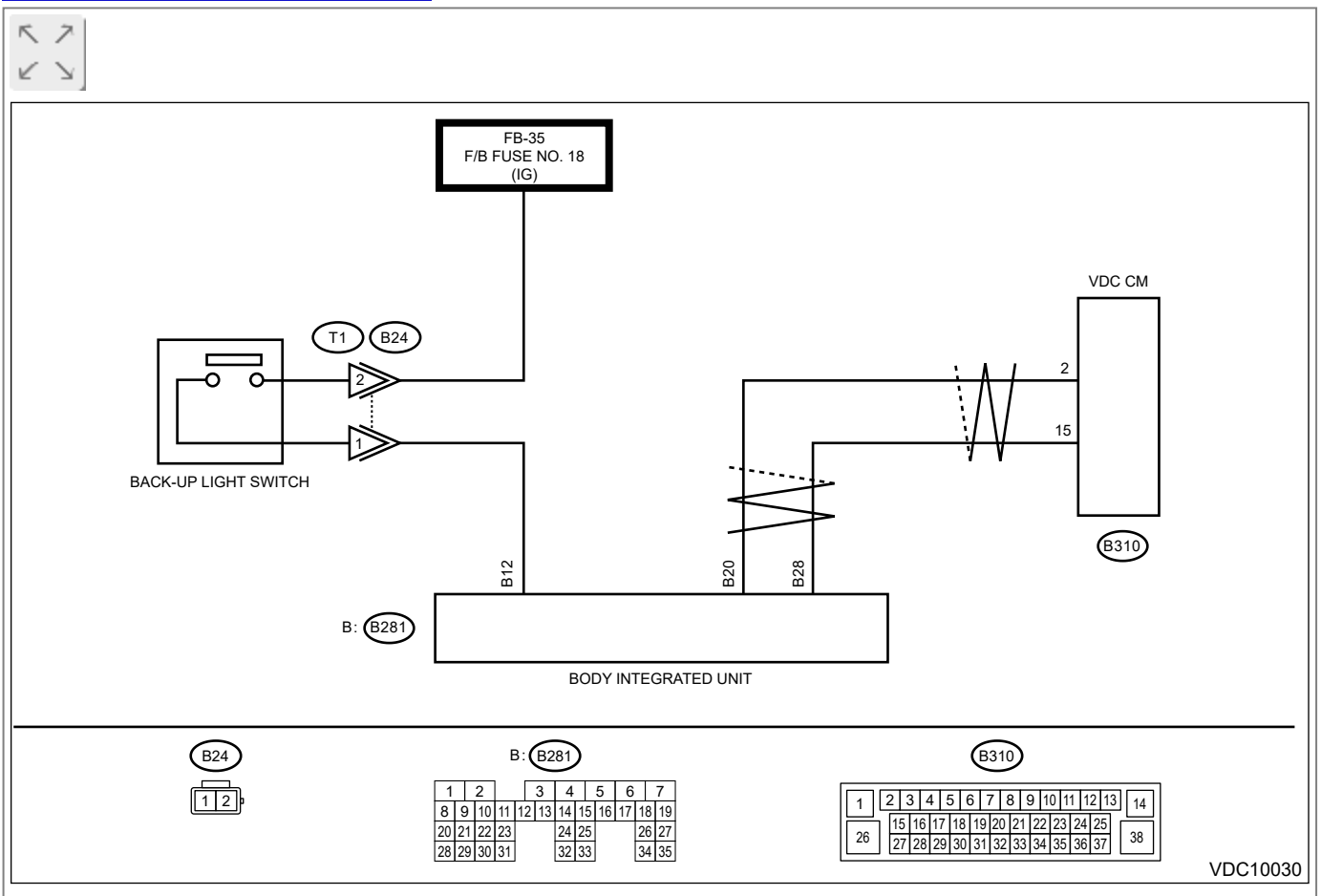
Trouble symptom:

Hill start assist does not operate.


Wiring diagram:

Back-up light system  [Ref. to WIRING SYSTEM>Back-up Light System>WIRING DIAGRAM > NON-TURBO MODEL.](#)

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM > NON-TURBO MODEL.](#)




1. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is there any fault in LAN system?




Yes

Perform the diagnosis according to DTC for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 2.](#)

2. CHECK REVERSE SIGNAL USING SUBARU SELECT MONITOR.

1. Using the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
2. Read [Reverse Signal] indicated on the display screen.

Is "OFF" displayed when the shift lever is placed in any position other than reverse, and is "ON" displayed in reverse position?

Yes

 [Go to 5.](#)

No

 [Go to 3.](#)

3. CHECK BACK-UP LIGHT ILLUMINATION.

1. Turn the ignition switch to ON.
2. Place the shift lever in reverse position.

Does the back-up light illuminate?

Yes

 [Go to 4.](#)

No

Repair the back-up light circuit.

4. CHECK HARNESS BETWEEN BODY INTEGRATED UNIT AND BACK-UP LIGHT SWITCH (CHECK FOR OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from body integrated unit and back-up light switch.
3. Measure the resistance of harness between body integrated unit and back-up light switch connector.

Connector & terminal

(B281) No. 12 — (B24) No. 1:

Is the resistance less than 1 Ω ?




Yes

Replace the back-up light switch.  [Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL\(6MT\)>Switches and Harness.](#)

No


Repair the harness between body integrated unit and back-up light switch connector.

5. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No


 [Go to 6.](#)

6. CHECK DETECTION OF OTHER DTCS FOR VDC.

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1571 BRAKE LAMP RELAY OFF STUCK

DTC detecting condition:

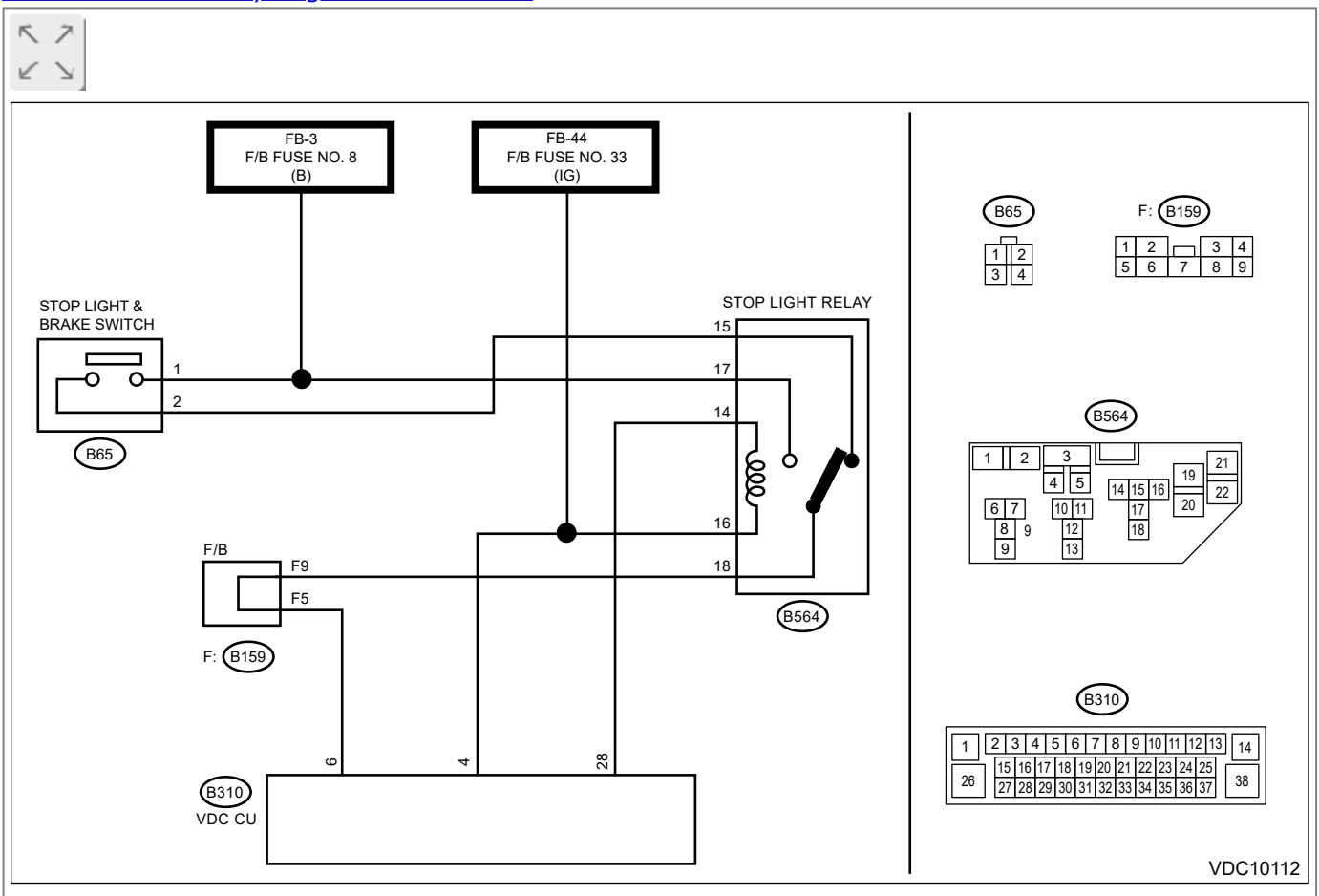
Defective stop light relay signal

Trouble symptom:


- Hill descent control does not operate. (Model with X mode)
- EyeSight does not operate. (Model with EyeSight)
- Brake lights do not illuminate sometimes.

Wiring diagram:

Stop light system  [Ref. to WIRING SYSTEM>Stop Light System>WIRING DIAGRAM > EXCEPT FOR MODEL WITHOUT EyeSight AND X MODE.](#)




1. CHECK DTC.

Check the DTC using Subaru Select Monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs related to the stop light switch displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 2.](#)

2. CHECK STOP LIGHT RELAY.



1. Turn the ignition switch to OFF.
2. Remove the stop light relay.
3. Measure the resistance between stop light relay terminals No. 14 — No. 16 when the battery voltage is applied.

Terminals

No. 17 —No. 18:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Replace the stop light relay.

3. CHECK VDCCM&H/U CONNECTOR.



Disconnect the connector from the VDCCM&H/U.

Is there poor contact or damage of the VDCCM&H/U connector?

Yes

Repair the VDCCM&H/U connector.

No

 [Go to 4.](#)

4. CHECK STOP LIGHT SWITCH CIRCUIT.



Measure the resistance between the stop light relay and the fuse.

Connector & terminal

(B564) No. 17 — (F/B fuse) No. 8:

Is the resistance less than 1 Ω ?

Yes

 [Go to 5.](#)

No

Repair or replace the open circuit in the power supply circuit including the fuse.

5. CHECK STOP LIGHT SWITCH CIRCUIT.




1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between stop light relay and chassis ground.

Connector & terminal

(B564) No. 17 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 6.](#)

No

Repair or replace the open circuit in the power supply circuit including the fuse.

6. CHECK STOP LIGHT RELAY CIRCUIT.



1. Turn the ignition switch to OFF.
2. Remove the stop light relay.
3. Turn the ignition switch to ON.
4. Measure the voltage between stop light relay and chassis ground.

Connector & terminal


(B564) No. 14 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Repair the stop light relay circuit.

No

 [Go to 7.](#)

7. CHECK STOP LIGHT RELAY CIRCUIT.




Measure the voltage between stop light relay and chassis ground.

Connector & terminal

(B564) No. 16 (+) — Chassis ground (-):

Is the voltage 10 V or more?



Yes

 [Go to 8.](#)

No


Repair the ignition power supply circuit.

8. CHECK VDCCM&H/U.

1. Turn the ignition switch to OFF.
2. Connect all connectors and relays.
3. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
4. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No


 [Go to 9.](#)

9. CHECK DETECTION OF OTHER DTCS FOR VDC.

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1572 BRAKE LAMP RELAY ON STUCK

DTC detecting condition:

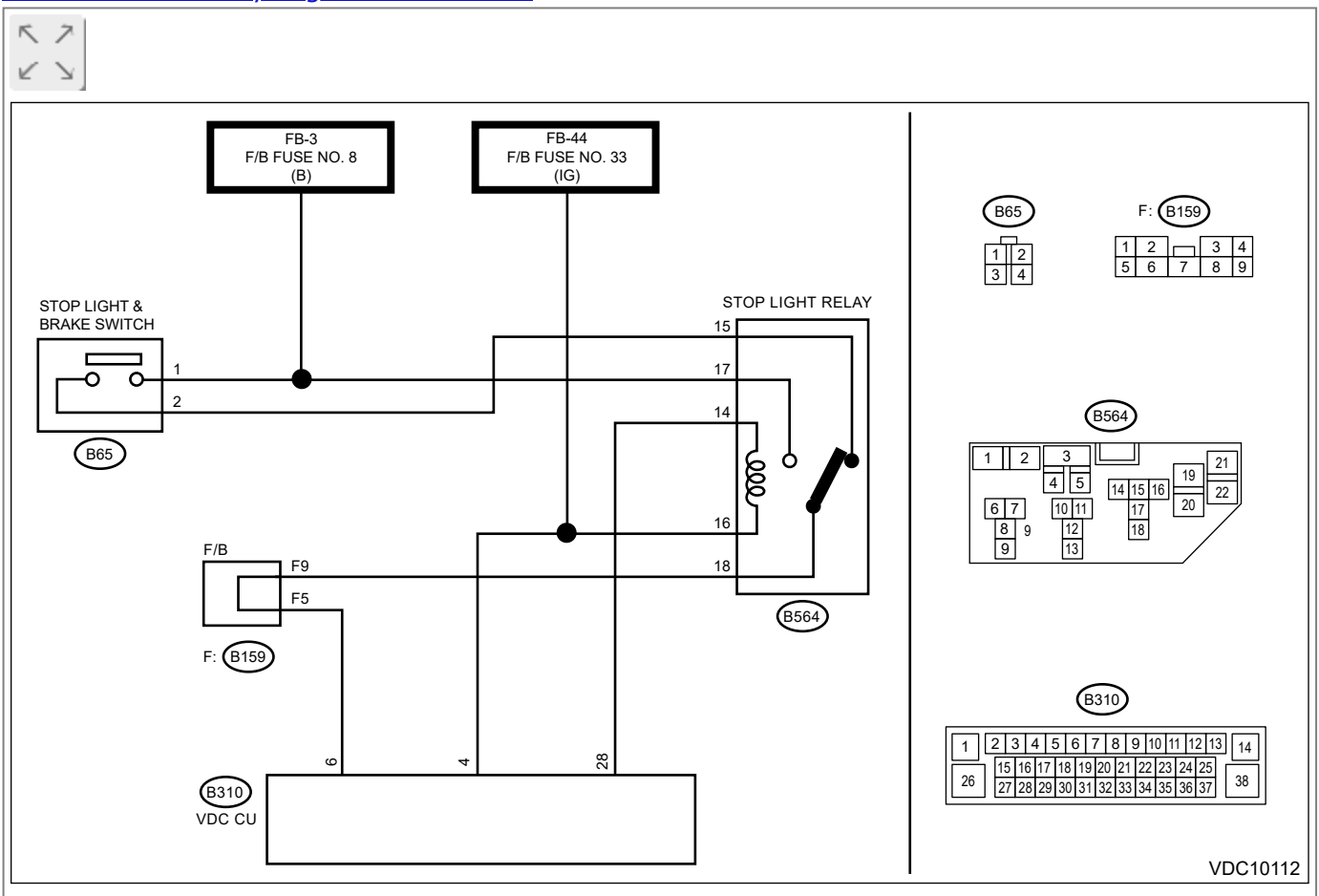
Defective stop light relay signal

Trouble symptom:

- Hill descent control does not operate. (Model with X mode)
- EyeSight does not operate. (Model with EyeSight)
- Brake lights do not go off sometimes.

Wiring diagram:

Stop light system  [Ref. to WIRING SYSTEM>Stop Light System>WIRING DIAGRAM > EXCEPT FOR MODEL WITHOUT EyeSight AND X MODE.](#)



1. CHECK FUSE.


1. Turn the ignition switch to OFF.
2. Check the fuse (No. 33).

Is the fuse blown out?

Yes

Replace the fuse (No. 33).

No

 [Go to 2.](#)

2. CHECK STOP LIGHT RELAY.




Measure the resistance between brake light relay terminals.

Terminals

No. 14 —No. 16:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Replace the stop light relay.

3. CHECK VDCCM&H/U CONNECTOR.




Disconnect the connector from the VDCCM&H/U.

Is there poor contact or damage of the VDCCM&H/U connector?

Yes

Repair the VDCCM&H/U connector.

No

 [Go to 4.](#)

4. CHECK STOP LIGHT RELAY CIRCUIT.



Measure the resistance between the stop light relay and the fuse or the VDCCM&H/U connector.


Connector & terminal

(B564) No. 14 — (B310) No. 28:

(B564) No. 16 — (F/B fuse) No. 33:

Is the resistance less than 1 Ω ?

Yes

 [Go to 5.](#)

No

Repair the stop light relay circuit.

5. CHECK STOP LIGHT RELAY CIRCUIT.



1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between stop light relay and chassis ground.

Connector & terminal

(B564) No. 16 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes



 [Go to 6.](#)

No

Repair the stop light relay circuit.


6. CHECK VDCCM&H/U.



1. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
2. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No

 [Go to 7.](#)


7. CHECK DETECTION OF OTHER DTCS FOR VDC.



 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1711 STEERING ANGLE SENSOR

DTC detecting condition:

Defective steering angle sensor

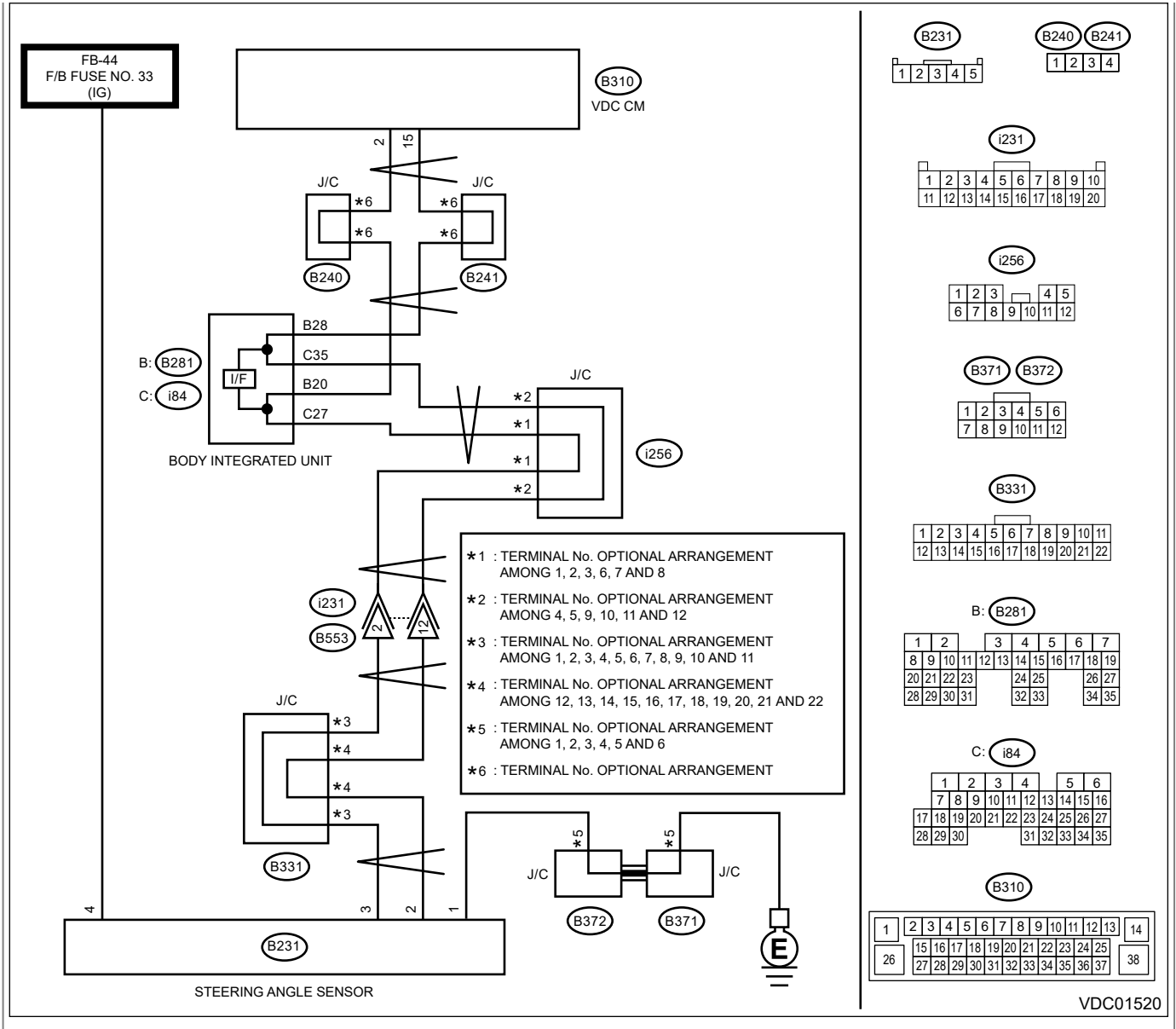
Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- Hill descent control does not operate. (Model with X mode)
- EyeSight does not operate. (Model with EyeSight)

Wiring diagram:

Vehicle dynamics control system  [Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.](#)





1. CHECK POWER SUPPLY FOR STEERING ANGLE SENSOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from steering angle sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between steering angle sensor and chassis ground.

Connector & terminal

(B231) No. 4 (+) — Chassis ground (-):

Is the voltage 10 — 15 V?

Yes

Go to 2.

Repair the steering angle sensor power supply circuit including the fuse.

No

2. CHECK GROUND CIRCUIT OF STEERING ANGLE SENSOR (CHECK FOR OPEN CIRCUIT).


Measure the resistance between steering angle sensor and chassis ground.

Connector & terminal

(B231) No. 1 — Chassis ground:

Is the resistance less than 10 Ω ?

Yes

 [Go to 3.](#)

No

Repair ground circuit in the steering angle sensor.

3. CHECK STEERING ANGLE SENSOR HARNESS (CHECK FOR OPEN CIRCUIT).

1. Disconnect the connector from the VDCCM&H/U.
2. Measure the resistance between VDCCM&H/U and steering angel sensor.

Connector & terminal

(B231) No. 2 — (B310) No. 15:

(B231) No. 3 — (B310) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Repair the harness between the steering angle sensor and VDCCM&H/U.

4. CHECK GROUND SHORT CIRCUIT OF STEERING ANGLE SENSOR HARNESS.

Measure the resistance between steering angle sensor and chassis ground.

Connector & terminal


(B231) No. 2 — Chassis ground:

(B231) No. 3 — Chassis ground:

Is the resistance 10 Ω or more?

Yes

Yes

 [Go to 5.](#)

No

Repair the harness between the steering angle sensor and VDCCM&H/U.

5. CHECK STEERING WHEEL.


1. Drive the vehicle on a flat road.
2. Park the vehicle straight.
3. Check the steering wheel for deviation from center.

Is the deviation from the center of steering wheel less than 5°?


Yes

 [Go to 6.](#)

No



Perform the centering adjustment of steering wheel, and perform the VDC sensor midpoint setting mode.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.](#)

6. CHECK OUTPUT OF STEERING ANGLE SENSOR USING SUBARU SELECT MONITOR.

1. Adjust steering wheel to the center position.
2. Using the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
3. Read [Steering Angle Sensor] indicated on the display screen.

Is the value of [Steering Angle Sensor] -10° — 10° ?

Yes




Perform the VDC sensor midpoint setting mode.  [Go to 7.](#)  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.](#)

No

Check the installation of the steering wheel and steering angle sensor.


7. CHECK STEERING ANGLE SENSOR USING SUBARU SELECT MONITOR.

1. Turn the ignition switch to OFF.

2. Connect all connectors.
3. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
4. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
5. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the steering angle sensor.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Steering Angle Sensor.](#)

No


 [Go to 8.](#)

8. CHECK DETECTION OF OTHER DTCS FOR VDC.

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1721 YAW RATE SENSOR

DTC detecting condition:

Defective yaw rate & G sensor

Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- Hill descent control does not operate. (Model with X mode)
- EyeSight does not operate. (Model with EyeSight)

1. MODELS WITHOUT EyeSight

1. INTERVIEW CUSTOMERS.

Check if the vehicle ran the road with banks or sandy surface (which does not mean a dirt road).

Did the vehicle run the road with banks or sandy surface (which does not mean a dirt road)?

Yes

VDCCM&H/U may record DTC when the vehicle ran the road with banks or sandy surface (which does not mean a dirt road).

No

[Go to 2.](#)

2. CHECK INSTALLATION OF VDCCM&H/U.

Is VDCCM&H/U installed properly without being tilted?

Is the bracket deformation-free?

Are the VDCCM&H/U installation bolts installed without missing or getting loose?

Yes

[Go to 3.](#)


No

Repair the defective part.

- Install VDCCM&H/U properly.
- Replace the bracket if faulty.
- Tighten the VDCCM&H/U installation bolt. [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>General Description>COMPONENT > VDC CONTROL MODULE AND HYDRAULIC CONTROL UNIT \(VDCCM&H/U\).](#)

[Go to 3.](#)

3. CHECK OUTPUT OF YAW RATE & G SENSOR WITH SUBARU SELECT MONITOR.


1. Drive the vehicle on a flat road.
2. Park the vehicle straight.
3. Using the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
4. Read [Yaw Rate Sensor] indicated on the display screen.

Is the reading of [Yaw Rate Sensor] $-4 - 4$ deg/s?


Yes

 [Go to 4.](#)

No

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

4. CHECK OUTPUT OF STEERING ANGLE SENSOR WITH SUBARU SELECT MONITOR.

1. Drive the vehicle on a flat road.
2. Park the vehicle straight.
3. Using the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
4. Read [Steering Angle Sensor] indicated on the display screen.

Is the value of [Steering Angle Sensor] $-10 - 10^\circ$?




Yes

 [Go to 5.](#)

No


Perform the centering adjustment of steering wheel.

5. CHECK VDCCM&H/U.

1. Turn the ignition switch to OFF.
2. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No

 [Go to 6.](#)


6. CHECK DETECTION OF OTHER DTCS FOR VDC.



 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)


No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

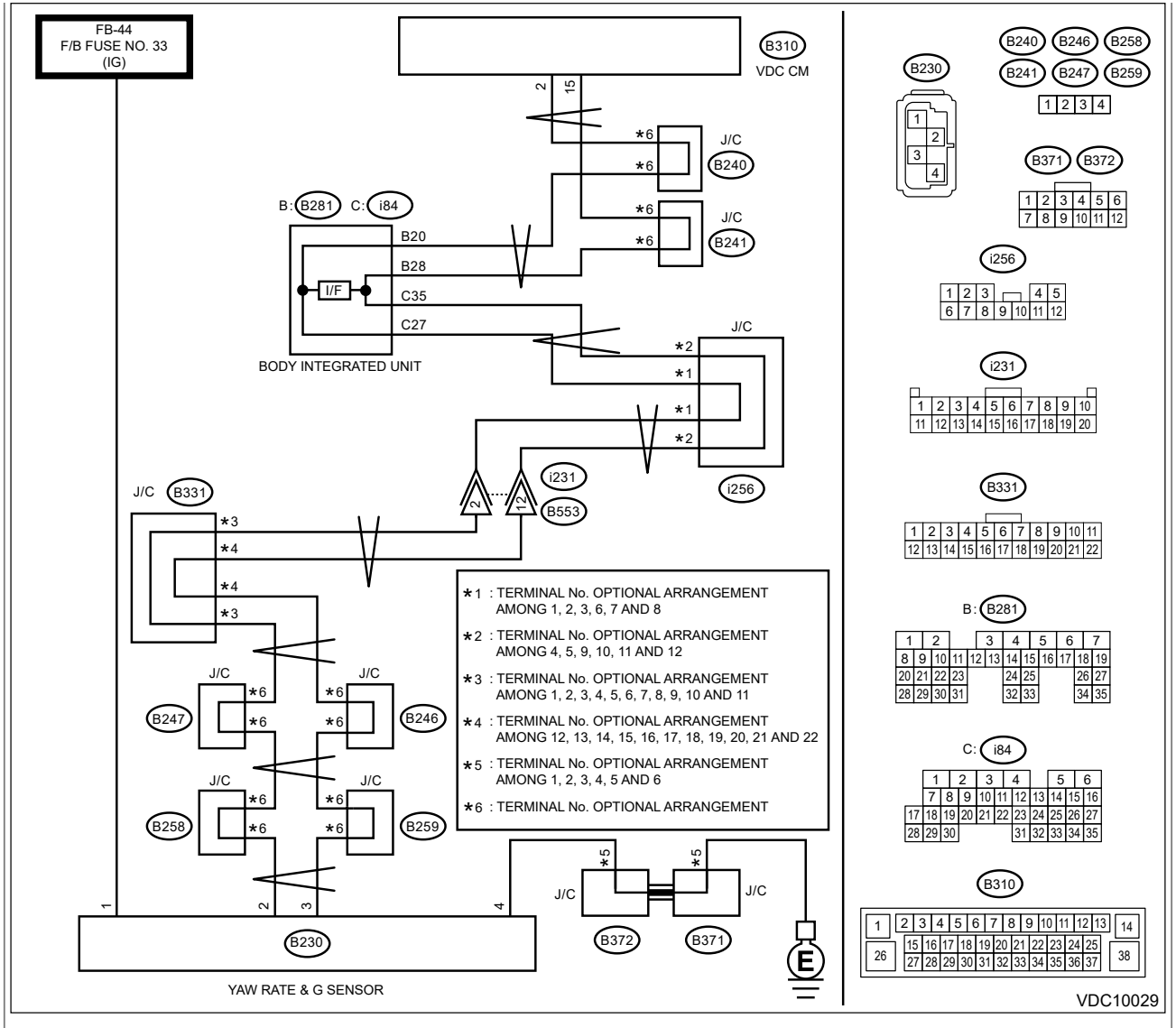
2. MODELS WITH EyeSight

Wiring diagram:


- Non-turbo model

Vehicle dynamics control system  [Ref. to WIRING SYSTEM>Vehicle Dynamics Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)

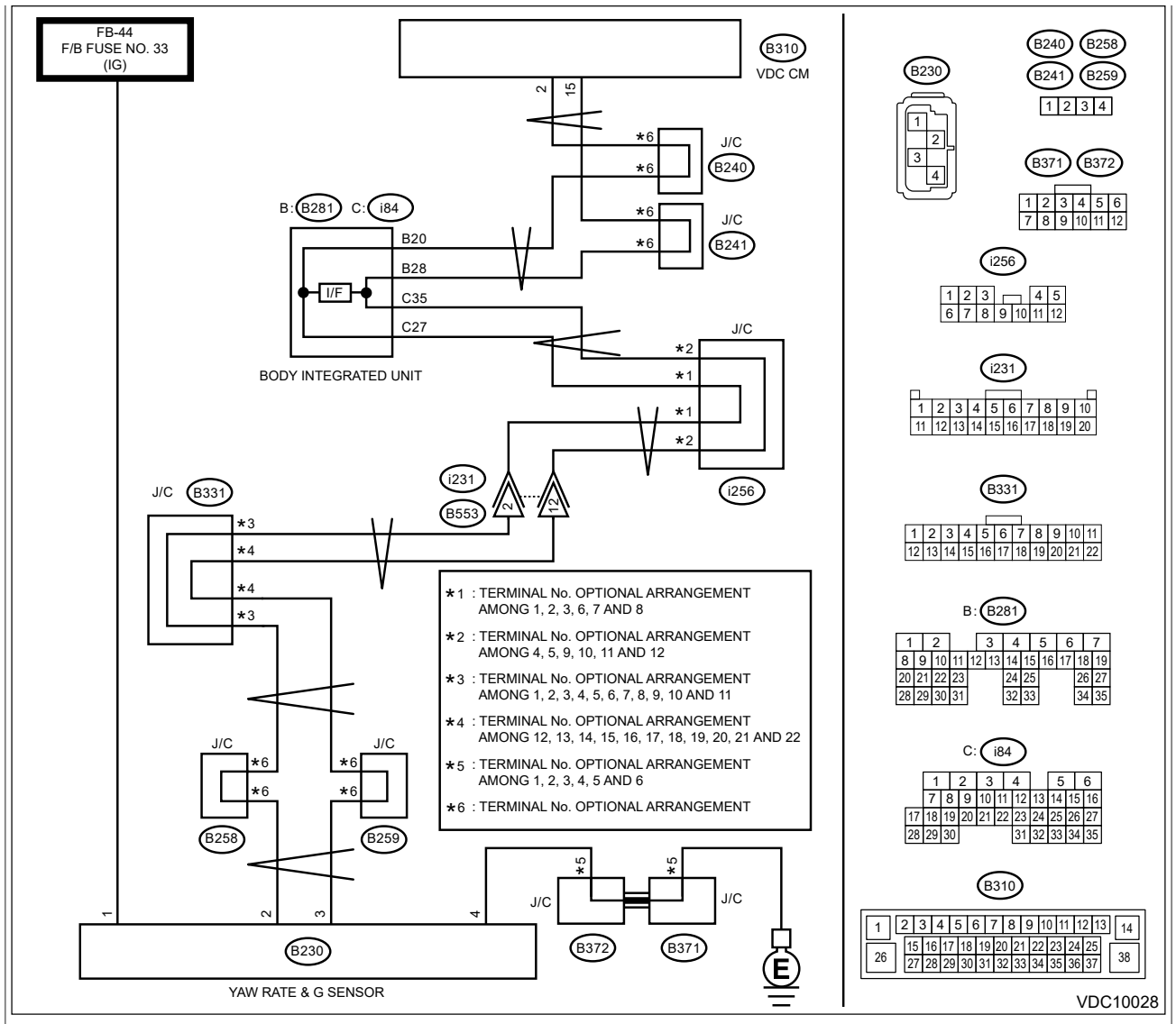




- Turbo model

Vehicle dynamics control system  [Ref. to WIRING SYSTEM>Vehicle Dynamics Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. INTERVIEW CUSTOMERS.

Check if the vehicle ran the road with banks or sandy surface (which does not mean a dirt road).

Did the vehicle run the road with banks or sandy surface (which does not mean a dirt road)?

Yes

VDCCM&H/U may record DTC when the vehicle ran the road with banks or sandy surface (which does not mean a dirt road).


No

[Go to 2.](#)

2. CHECK YAW RATE & G SENSOR INSTALLATION.

Is the yaw rate & G sensor installation bolt tightened to 7.5 N·m (0.76 kgf-m, 5.5 ft-lb)?

Yes

 [Go to 3.](#)

No

Tighten the yaw rate & G sensor installation bolt.

3. CHECK POWER SUPPLY OF YAW RATE & G SENSOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from yaw rate & G sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between yaw rate & G sensor and chassis ground.

Connector & terminal

(B230) No. 1 (+) — Chassis ground (-):

Is the voltage 10 — 15 V?

Yes

 [Go to 4.](#)

No

Repair the yaw rate & G sensor power supply circuit.

4. CHECK YAW RATE & G SENSOR GROUND CIRCUIT.

Measure the resistance between yaw rate & G sensor and chassis ground.

Connector & terminal

(B230) No. 4 — Chassis ground:

Is the resistance less than 10 Ω ?


Yes

 [Go to 5.](#)

No

Repair the yaw rate & G sensor ground circuit.

5. CHECK OUTPUT OF YAW RATE & G SENSOR WITH SUBARU SELECT MONITOR.


1. Drive the vehicle on a flat road.
2. Park the vehicle straight.
3. Using the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
4. Read [Yaw Rate Sensor] indicated on the display screen.

Is the reading of [Yaw Rate Sensor] -4 — 4 deg/s?




 [Go to 6.](#)

Yes

No

Replace the yaw rate & G sensor.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Yaw Rate and G Sensor.](#)

6. CHECK YAW RATE & G SENSOR.


1. Turn the ignition switch to OFF.
2. Connect all connectors.
3. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
4. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
5. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?





Yes

 [Go to 7.](#)

No


 [Go to 8.](#)

7. CHECK VDCCM&H/U.

1. Turn the ignition switch to OFF.
2. Replace the yaw rate & G sensor.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Yaw Rate and G Sensor.](#)
3. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
4. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
5. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No


 [Go to 9.](#)

8. CHECK DETECTION OF OTHER DTCS FOR VDC.

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.


9. CHECK DETECTION OF OTHER DTCS FOR VDC.



 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Malfunction is found in original yaw rate & G sensor.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1731 G SENSOR ABNORMAL

Note:

For the diagnostic procedure, refer to "DTC C1732 LATERAL G SENSOR ABNORMAL".

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC C1732 LATERAL G SENSOR.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1732 LATERAL G SENSOR

DTC detecting condition:

Defective lateral G sensor

Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- Hill descent control does not operate. (Model with X mode)
- EyeSight does not operate. (Model with EyeSight)

1. MODELS WITHOUT EyeSight

1. CHECK INSTALLATION OF VDCCM&H/U.

Is VDCCM&H/U installed properly without being tilted?

Is the bracket deformation-free?



Are the VDCCM&H/U installation bolts installed without missing or getting loose?

Yes


 [Go to 2.](#)

No

Repair the defective part.

- Install VDCCM&H/U properly.
 - Replace the bracket if faulty.
 - Tighten the VDCCM&H/U installation bolt.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>General Description>COMPONENT > VDC CONTROL MODULE AND HYDRAULIC CONTROL UNIT \(VDCCM&H/U\).](#)
-  [Go to 2.](#)

2. CHECK OUTPUT OF STEERING ANGLE SENSOR USING SUBARU SELECT MONITOR.

1. Park the vehicle straight on a level surface.
2. Using the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
3. Read [Steering Angle Sensor] indicated on the display screen.

Is the value of [Steering Angle Sensor] $-10 - 10^{\circ}$?


Yes

 [Go to 3.](#)

No

Check the installation of steering angle sensor.

3. CHECK OUTPUT OF LATERAL G SENSOR AND LONGITUDINAL G SENSOR WITH SUBARU SELECT MONITOR.


1. Park the vehicle straight on a level surface.
2. Using the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
3. Read [Lateral G Sensor] and [Longitudinal G Sensor] indicated on the display screen.

Are the values of [Lateral G Sensor] and [Longitudinal G Sensor] $-2 - 2 \text{ m/s}^2$?


Yes

 [Go to 4.](#)

No

Recheck from step 1, and if the problem is not solved, go to 7.  [Go to 7.](#)

4. SET 0 POINT OF LATERAL G SENSOR AND LONGITUDINAL G SENSOR WITH SUBARU SELECT MONITOR.


1. Using the Subaru Select Monitor, select Work Support.
2. Perform the VDC sensor midpoint setting mode.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.](#)

Is the 0 point setting successful?

Yes

 [Go to 5.](#)

No

Recheck from step 1, and when the 0 point setting is not possible, replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

5. PERFORM DRIVING TEST.

Drive approximately 10 minutes, and check if the warning lights illuminate or improperly operate during driving.


In a safe place, drive the vehicle while alternating acceleration and deceleration as much as possible.

Did the ABS warning light or VDC warning light remain off?
Does ABS or VDC operate without malfunction?


Yes

 [Go to 6.](#)

No

Recheck from step 1, and when the warning lights illuminate or improperly operate, replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

6. CHECK OUTPUT OF LATERAL G SENSOR AND LONGITUDINAL G SENSOR WITH SUBARU SELECT MONITOR.


1. Park the vehicle on a level surface.
2. Using the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
3. Read [Lateral G Sensor] and [Longitudinal G Sensor] indicated on the display screen.

Are the values of [Lateral G Sensor] and [Longitudinal G Sensor] $-1.5 - 1.5 \text{ m/s}^2$?


Yes

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

No

Recheck from step 1, and if the problem is not solved, replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

7. CHECK OUTPUT OF LATERAL G SENSOR AND LONGITUDINAL G SENSOR WITH SUBARU SELECT MONITOR.


1. Remove the VDCCM&H/U installation bolt and bracket.
2. Keep VDCCM&H/U in a horizontal position.
3. Using the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
4. Read [Lateral G Sensor] and [Longitudinal G Sensor] indicated on the display screen.

When the VDCCM & H/U is in a horizontal position, are the values of [Lateral G Sensor] and [Longitudinal G Sensor] $-1.5 - 1.5 \text{ m/s}^2$?

Yes

Check the bracket and brake pipe, and install VDCCM&H/U in a horizontal position to the vehicle.

No

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

2. MODELS WITH EyeSight

1. CHECK YAW RATE & G SENSOR INSTALLATION.

Is the yaw rate & G sensor installation bolt tightened to 7.5 N·m (0.76 kgf·m, 5.5 ft·lb)?


Yes

 [Go to 2.](#)

No

Tighten the yaw rate & G sensor attachment bolt.

2. CHECK OUTPUT OF LATERAL G SENSOR WITH SUBARU SELECT MONITOR.

1. Park the vehicle on a level surface.
2. Using the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
3. Read [Lateral G Sensor] indicated on the display screen.

Is the value of [Lateral G Sensor] $-1.5 - 1.5 \text{ m/s}^2$?


Yes

 [Go to 3.](#)

No


Replace the yaw rate & G sensor.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Yaw Rate and G Sensor.](#)

3. CHECK OUTPUT OF LATERAL G SENSOR WITH SUBARU SELECT MONITOR.

1. Turn the ignition switch to OFF.
2. Remove the yaw rate & G sensor from vehicle.
3. Using the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
4. Read [Lateral G Sensor] indicated on the display screen.

When the yaw rate & G sensor is inclined 90° to the right, is the value of [Lateral G Sensor] 6.8 – 12.8 m/s²?

Yes

 [Go to 4.](#)

No

Replace the yaw rate & G sensor.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Yaw Rate and G Sensor.](#)

4. CHECK LATERAL G SENSOR WITH SUBARU SELECT MONITOR.

Read [Lateral G Sensor] indicated on the display screen.

When the yaw rate & G sensor is inclined 90° to the left, is the value of [Lateral G Sensor] –6.8 – –12.8 m/s²?

Yes

 [Go to 5.](#)

No

Replace the yaw rate & G sensor.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Yaw Rate and G Sensor.](#)

5. CHECK POOR CONTACT OF CONNECTORS.

Turn the ignition switch to OFF.

Is there poor contact of connector between VDCCM&H/U and yaw rate & G sensor?




Yes

Repair the connector.

No


 [Go to 6.](#)

6. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No

 [Go to 7.](#)


7. CHECK DETECTION OF OTHER DTCS FOR VDC.



 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1733 LONGITUDINAL G SENSOR

DTC detecting condition:


Defective longitudinal G sensor

Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- Hill descent control does not operate. (Model with X mode)
- EyeSight does not operate. (Model with EyeSight)

1. MODELS WITHOUT EyeSight

Note:

For the diagnostic procedure, refer to "DTC C1732 LATERAL G SENSOR ABNORMAL".  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC C1732 LATERAL G SENSOR.](#)


2. MODELS WITH EyeSight

1. WHETHER A WHEEL TURNED FREELY OR NOT.

Check if the wheels have been turned freely for one minute or more, such as when the vehicle is jacked-up, under full-lock cornering or when the wheels are not in contact with road surface.

Did the wheels turn freely?


Yes

VDC is normal. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)

No

 [Go to 2.](#)

2. CHECK OUTPUT OF LONGITUDINAL G SENSOR USING SUBARU SELECT MONITOR.


1. Park the vehicle on a level surface.
2. Using the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
3. Read [Longitudinal G Sensor] indicated on the display screen.

Is the value of [Longitudinal G Sensor] $-1.2 - 1.2 \text{ m/s}^2$?



Yes

 [Go to 3.](#)

No

Replace the yaw rate & G sensor.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Yaw Rate and G Sensor.](#)

3. CHECK OUTPUT OF LONGITUDINAL G SENSOR USING SUBARU SELECT MONITOR.

1. Turn the ignition switch to OFF.
2. Remove the yaw rate & G sensor from vehicle.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Yaw Rate and G Sensor.](#)
3. Using the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
4. Read [Longitudinal G Sensor] indicated on the display screen.

When the yaw rate & G sensor is inclined 90° to the front, is the value of [Longitudinal G Sensor] $-6.8 - -12.8 \text{ m/s}^2$?

Yes

 [Go to 4.](#)

No

Replace the yaw rate & G sensor.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Yaw Rate and G Sensor.](#)

4. CHECK OUTPUT OF LONGITUDINAL G SENSOR USING SUBARU SELECT MONITOR.

Read [Longitudinal G Sensor] indicated on the display screen.

When the yaw rate & G sensor is inclined 90° to the rear, is the value of [Longitudinal G Sensor] $6.8 - 12.8 \text{ m/s}^2$?

Yes

 [Go to 5.](#)

No

Replace the yaw rate & G sensor.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Yaw Rate and G Sensor.](#)

5. CHECK POOR CONTACT OF CONNECTOR.

Turn the ignition switch to OFF.

Is there poor contact of connector between VDCCM&H/U and yaw rate & G sensor?




Yes

Repair the connector.

No


 [Go to 6.](#)

6. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No


 [Go to 7.](#)

7. CHECK DETECTION OF OTHER DTCS FOR VDC.

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1741 PRESSURE SENSOR

DTC detecting condition:

Defective pressure sensor

Trouble symptom:


- ABS does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- Hill descent control does not operate. (Model with X mode)
- EyeSight does not operate. (Model with EyeSight)

1. CHECK STOP LIGHT SWITCH CIRCUIT.

Check stop light switch open circuit.

Is the check result OK?

Yes

 [Go to 2.](#)


No

Repair the stop light switch circuit.

Note:

If there is malfunction in the stop light circuit, DTC may be recorded in the memory.

2. CHECK STOP LIGHT SWITCH.


Check the ON position of the stop light switch.  [Ref. to BRAKE>Stop Light Switch>ADJUSTMENT.](#)

Is the check result OK?


Yes

 [Go to 3.](#)

No


Adjust the installation position of the stop light switch.  [Ref. to BRAKE>Stop Light Switch>ADJUSTMENT.](#)

3. CHECK OUTPUT OF PRESSURE SENSOR WITH SUBARU SELECT MONITOR.


1. Using the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
2. Read [Pressure Sensor] indicated on the display screen.

With the brake pedal released, is the value of [Pressure Sensor] 0 – 11 bar?


Yes

 [Go to 4.](#)

No

Replace the VDCCM&H/U.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\).](#)

4. CHECK OUTPUT OF PRESSURE SENSOR WITH SUBARU SELECT MONITOR.


1. Using the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
2. Read [Pressure Sensor] indicated on the display screen.

When the brake pedal is operated, does the value of [Pressure Sensor] change in accordance with the brake pedal?




Yes

 [Go to 5.](#)

No


Replace the VDCCM&H/U.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\).](#)

5. CHECK VDCCM&H/U.

1. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
2. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
3. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM&H/U.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\).](#)

No

 [Go to 6.](#)


6. CHECK DETECTION OF OTHER DTCS FOR VDC.



 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1742 WHEEL CYLINDER PRESSURE SENSOR


DTC detecting condition:

Defective pressure sensor

Trouble symptom:

EyeSight does not operate. (Model with EyeSight)

1. CHECK OUTPUT OF PRESSURE SENSOR WITH SUBARU SELECT MONITOR.


1. Using the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
2. Read [FL Wheel Cylinder Pressure Sensor Output] and [FR Wheel Cylinder Pressure Sensor Output] indicated on the display screen.

With the brake pedal released, are the values of [FL Wheel Cylinder Pressure Sensor Output] and [FR Wheel Cylinder Pressure Sensor Output] 0 – 11 bar?


Yes

 [Go to 2.](#)

No

Replace the VDCCM&H/U.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\).](#)

2. CHECK OUTPUT OF PRESSURE SENSOR WITH SUBARU SELECT MONITOR.


1. Using the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
2. Read [FL Wheel Cylinder Pressure Sensor Output] and [FR Wheel Cylinder Pressure Sensor Output] indicated on the display screen.

When the brake pedal is operated, do the values of [FL Wheel Cylinder Pressure Sensor Output] and [FR Wheel Cylinder Pressure Sensor Output] change in accordance with the brake pedal? In addition, is the difference between [FL Wheel Cylinder Pressure Sensor Output] and [FR Wheel Cylinder Pressure Sensor Output] values less than 10 bar?




Yes

 [Go to 3.](#)

No


Replace the VDCCM&H/U.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\).](#)

3. CHECK VDCCM&H/U.


1. Clear the memory.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
2. Perform the Inspection Mode.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Inspection Mode.](#)
3. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC displayed?

Yes

Replace the VDCCM&H/U.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\).](#)

No


 [Go to 4.](#)

4. CHECK DETECTION OF OTHER DTCS FOR VDC.

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any other DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1811 SYSTEM

DTC detecting condition:

ABS and VDC long time sequential control

Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- EBD may not operate.
- Hill start assist does not operate.
- Hill descent control does not operate. (Model with X mode)
- EyeSight does not operate. (Model with EyeSight)

1. CHECK INSTALLATION OF VDCCM&H/U.

Is VDCCM&H/U installed properly without being tilted?

Is the bracket deformation-free?



Are the VDCCM&H/U installation bolts installed without missing or getting loose?

Yes

 [Go to 2.](#)

No

Repair the defective part.

- Install VDCCM&H/U properly.
 - Replace the bracket if faulty.
 - Tighten the VDCCM&H/U installation bolt.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>General Description>COMPONENT > VDC CONTROL MODULE AND HYDRAULIC CONTROL UNIT \(VDCCM&H/U\).](#)
-  [Go to 2.](#)

2. CHECK STEERING WHEEL.


1. Drive the vehicle on a flat road.
2. Park the vehicle straight.
3. Check the steering wheel for deviation from center.

Is the deviation from the center of steering wheel less than 5°?

Yes

 [Go to 3.](#)


No

Perform the centering adjustment of steering wheel, and perform the VDC sensor midpoint setting mode.  [Ref. to VEHICLE DYNAMICS CONTROL](#)

[\(VDC\)>VDC Control Module and Hydraulic Control Unit](#)
[\(VDCCM&H/U\)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.](#)


 [Go to 3.](#)

3. CHECK OUTPUT OF STEERING ANGLE SENSOR USING SUBARU SELECT MONITOR.

1. Adjust steering wheel to the center position.
2. Using the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
3. Read [Steering Angle Sensor] indicated on the display screen.

Is the value of [Steering Angle Sensor] $-10^{\circ} - 10^{\circ}$?


Yes

 [Go to 4.](#)

No

Check the installation of the steering wheel and steering angle sensor, and correct the installation if it is improper. If the installation condition is correct, replace the sensor.

4. CHECK OUTPUT OF SENSORS USING SUBARU SELECT MONITOR.

1. Drive the vehicle on a flat road.
2. Park the vehicle straight.
3. Using the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
4. Read [Lateral G Sensor], [Longitudinal G Sensor] and [Yaw Rate Sensor] indicated on the display screen.

Is the reading of each sensor following value?

[Lateral G Sensor]: $-2 - 2 \text{ m/s}^2$


[Longitudinal G Sensor]: $-2 - 2 \text{ m/s}^2$

[Yaw Rate Sensor]: $-4 - 4 \text{ deg/s}$


Yes

 [Go to 5.](#)

No


Recheck from step 1, and if the problem is not solved, go to next.  [Go to 8.](#)

5. SET 0 POINT FOR LONGITUDINAL G SENSOR USING SUBARU SELECT MONITOR.



1. Using the Subaru Select Monitor, select Work Support.
2. Perform the VDC sensor midpoint setting mode.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.](#)

Is the 0 point setting successful?

Yes

 [Go to 6.](#)

No


Recheck from step 1, and when the 0 point setting is not possible, replace the VDCCM and the steering angle sensor.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Steering Angle Sensor.](#)

6. PERFORM DRIVING TEST.


Drive approximately 10 minutes, and check if the warning lights illuminate or improperly operate during driving.

Did the ABS warning light or VDC warning light remain off?
Does ABS or VDC operate without malfunction?


Yes

 [Go to 7.](#)

No

Recheck from step 1, and when the warning lights illuminate or improperly operate, replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

7. CHECK OUTPUT OF SENSORS USING SUBARU SELECT MONITOR.

1. Park the vehicle on a level surface.
2. Using the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
3. Read [Lateral G Sensor], [Longitudinal G Sensor] and [Yaw Rate Sensor] indicated on the display screen.

Is the reading of each sensor following value?

[Lateral G Sensor]: $-2 - 2 \text{ m/s}^2$


[Longitudinal G Sensor]: $-2 - 2 \text{ m/s}^2$

[Yaw Rate Sensor]: $-4 - 4 \text{ deg/s}$


Yes

Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

No

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

8. CHECK OUTPUT OF SENSORS USING SUBARU SELECT MONITOR.

1. Remove the VDCCM&H/U installation bolt and bracket.
2. Keep VDCCM&H/U in a horizontal position.
3. Using the Subaru Select Monitor, select Data monitor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
4. Read [Lateral G Sensor], [Longitudinal G Sensor] and [Yaw Rate Sensor] indicated on the display screen.

When VDCCM&H/U is in a horizontal position, is the reading of each sensor following value?

[Lateral G Sensor]: $-1.5 - 1.5 \text{ m/s}^2$


[Longitudinal G Sensor]: $-1.5 - 1.5 \text{ m/s}^2$

[Yaw Rate Sensor]: $-4 - 4 \text{ deg/s}$

Yes

Check the bracket and brake pipe, and install VDCCM&H/U in a horizontal position to the vehicle.

No

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1821 BRAKE TEMPERATURE ABNORMAL


DTC detecting condition:

Abnormal brake disc temperature

Trouble symptom:

Hill descent control does not operate. (Model with X mode)

1. CHECK DTC.

1. Connect all connectors.
2. Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the DTC a current malfunction?

Yes

Stop the vehicle and turn off the engine until the DTC becomes a past malfunction.


No

It results from a temporal increase in brake temperature. Check the brake pads, disc rotors, and brake fluid.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF


Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"


Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM


Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0123 LOST COMMUNICATION WITH YAW RATE SENSOR MODULE


Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0126 LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE


Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE


Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"


Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0402 INVALID DATA RECEIVED FROM TCM


Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE


Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0428 INVALID DATA RECEIVED FROM STEERING ANGLE SENSOR MODULE


Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0513 INVALID DATA RECEIVED FROM YAW RATE SENSOR MODULE


Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1235 LOST COMMUNICATION WITH EYESIGHT


Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

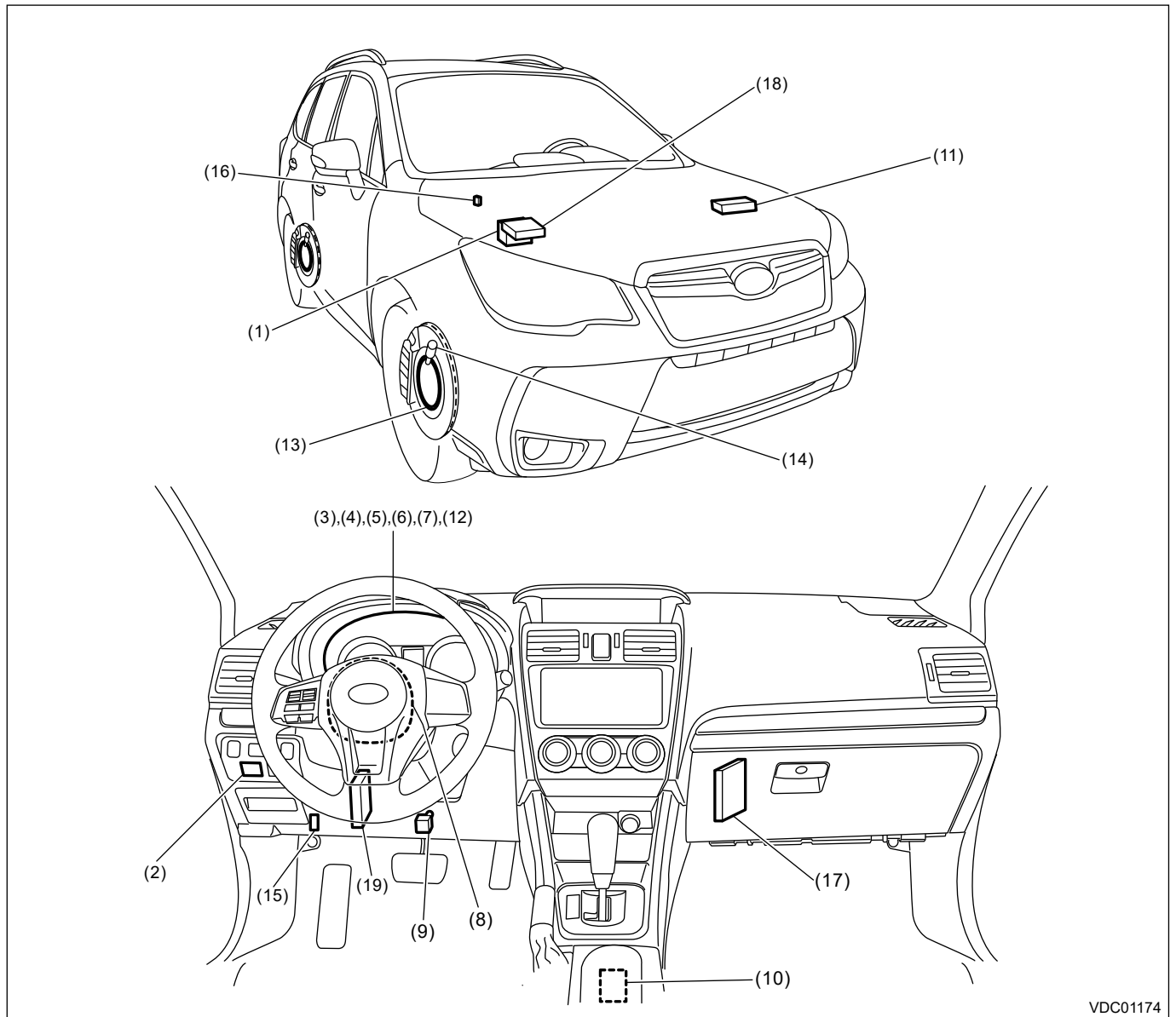
DTC U1433 INVALID DATA RECEIVED FROM EYESIGHT

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

BRAKE CONTROL (DIAGNOSTICS) > Electrical Component Location

LOCATION



VDC01174

- | | | |
|---|--|--|
| (1) VDC control module and hydraulic control unit (VDCCM&H/U) | (8) Steering angle sensor | (14) ABS wheel speed sensor |
| (2) VDC OFF switch | (9) Stop light and brake switch | (15) Data link connector |
| (3) ABS warning light | (10) Yaw rate & G sensor (model with EyeSight) | (16) Two-way connector |
| (4) Brake warning light (EBD warning light) | (11) Brake light relay (model with X mode and model with EyeSight) | (17) Engine control module (ECM) (non-turbo model) |
| (5) VDC warning light & VDC indicator light | (12) Hill descent control indicator light (model with X mode) | (18) Engine control module (ECM) (turbo model) |

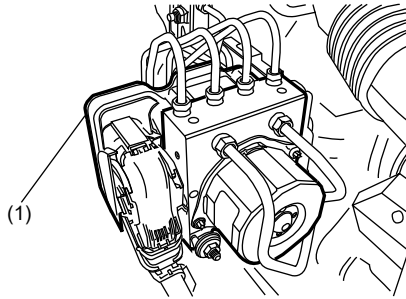
(6) VDC OFF indicator light

(13) Magnetic encoder

(19) Transmission control module (TCM)

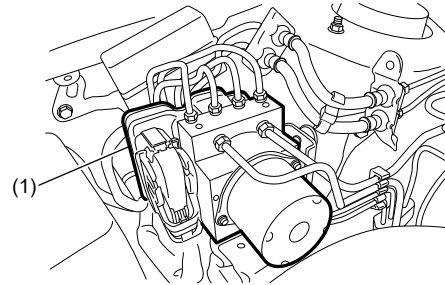
(7) Hill start assist warning light

• Models without EyeSight

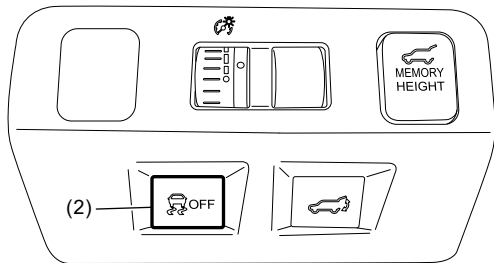


VDC00948

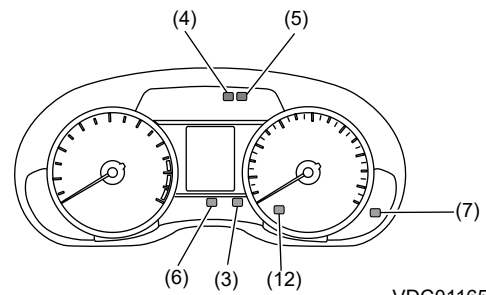
• Models with EyeSight



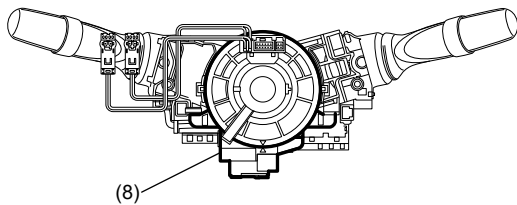
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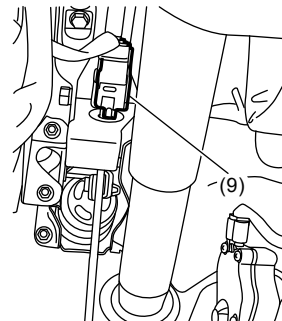
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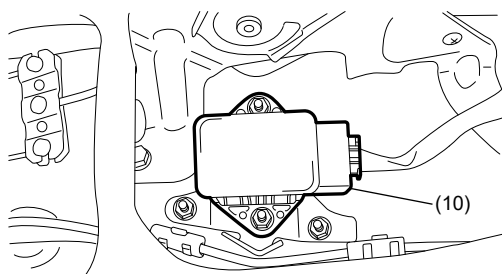
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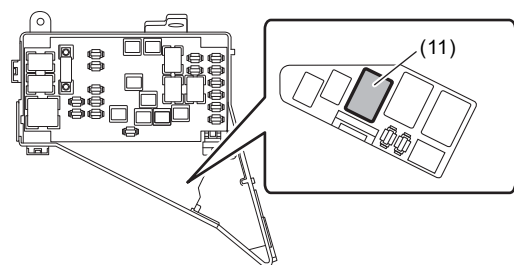
VDC00952



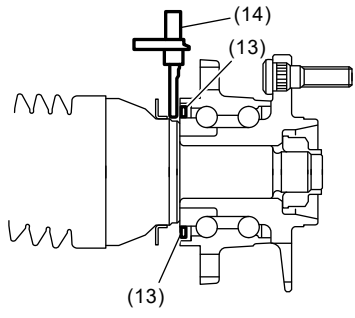
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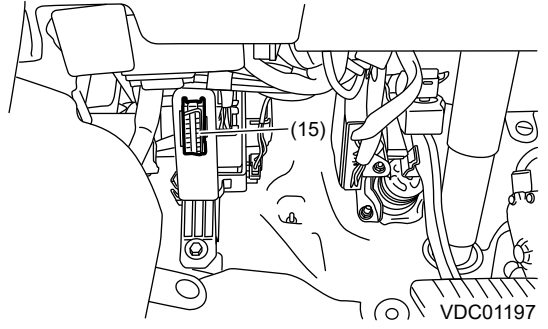
VDC01211



VDC10093



VDC01195



VDC01197

BRAKE CONTROL (DIAGNOSTICS) > General Description

CAUTION

1. SRS AIRBAG SYSTEM

Airbag system wiring harness is routed near the ABS wheel speed sensor and VDCCM&H/U.

Caution:

- **Do not use electrical test equipment on wiring harness and connector circuits of the airbag system.**
- **Be careful not to damage the airbag system wiring harness when servicing the ABS wheel speed sensor and VDCCM&H/U.**

BRAKE CONTROL (DIAGNOSTICS) > General Description

INSPECTION

Before performing diagnosis, check the following items which might affect VDC problems.

1. BATTERY

Check the battery. [🔗 Ref. to STARTING/CHARGING SYSTEMS\(H4DOTC\)>General Description.](#)
[🔗 Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery>INSPECTION.](#)

2. GROUND

Check the installation of the ground bolt for VDC.

3. BRAKE FLUID

1. Check the brake fluid level.
2. Check the brake fluid for leaks.

4. HYDRAULIC UNIT

Check the hydraulic unit.

- When using the brake tester [🔗 Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>INSPECTION > CHECKING THE HYDRAULIC UNIT ABS OPERATION WITH THE BRAKE TESTER.](#)
- When not using the brake tester [🔗 Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>INSPECTION > CHECKING THE HYDRAULIC UNIT ABS OPERATION BY PRESSURE GAUGE.](#)

5. BRAKE DRAG

Check for brake drag.

6. BRAKE PAD AND ROTOR

Check the brake pad and rotor.

- Front [🔗 Ref. to BRAKE>Front Brake Pad>INSPECTION.](#) [🔗 Ref. to BRAKE>Front Disc Rotor>INSPECTION.](#)
- Rear [🔗 Ref. to BRAKE>Rear Brake Pad>INSPECTION.](#) [🔗 Ref. to BRAKE>Rear Disc Rotor>INSPECTION.](#)


7. TIRES

Check the tire specifications, tire wear and air pressure. [🔗 Ref. to WHEEL AND TIRE SYSTEM>General Description>SPECIFICATION.](#)

BRAKE CONTROL (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	— (Newly adopted tool)	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Oscilloscope	Used for measuring the sensor.
DST-i	Used together with Subaru Select Monitor 4.

BRAKE CONTROL (DIAGNOSTICS) > General Diagnostic Table

INSPECTION

Symptoms		Main probable cause	Other probable cause
Poor brake performance	Long braking/stopping distance	<ul style="list-style-type: none"> • VDCCM&H/U • Brake pad • Aeration to brake line • Tire specifications, tire wear and air pressures • Incorrect wiring or piping connections 	<ul style="list-style-type: none"> • Defective ABS wheel speed sensor or sensor gap • Defective steering angle sensor or improper neutral position • Defective yaw rate & G sensor or improper installation of VDCCM&H/U. • Master cylinder • Brake caliper • Disc rotor • Brake pipe • Brake booster
	Wheel lock	<ul style="list-style-type: none"> • VDCCM&H/U • Defective ABS wheel speed sensor or sensor gap • Incorrect wiring or piping connections 	<ul style="list-style-type: none"> • Defective steering angle sensor or improper neutral position • Defective yaw rate & G sensor or improper installation of VDCCM&H/U. • Brake caliper • Brake pipe
	Brake drag	<ul style="list-style-type: none"> • VDCCM&H/U • Defective ABS wheel speed sensor or sensor gap • Master cylinder • Brake caliper • Parking brake • Axle and wheels • Brake pedal play 	<ul style="list-style-type: none"> • Defective steering angle sensor or improper neutral position • Defective yaw rate & G sensor or improper installation of VDCCM&H/U. • Brake pad • Brake pipe
	Long brake pedal stroke	<ul style="list-style-type: none"> • Aeration to brake line • Brake pedal play 	<ul style="list-style-type: none"> • VDCCM&H/U • Master cylinder • Brake caliper • Brake pad • Brake pipe • Brake booster
	Vehicle vertical pitching	<ul style="list-style-type: none"> • VDCCM&H/U • Road surface (uneven) • Suspension play or fatigue (reduced damping) • Incorrect wiring or piping connections 	<ul style="list-style-type: none"> • Defective ABS wheel speed sensor or sensor gap • Defective steering angle sensor or improper neutral position • Defective yaw rate & G sensor or improper installation of VDCCM&H/U.

<p>Poor brake performance</p>	<p>Unstable or uneven braking</p>	<ul style="list-style-type: none"> • VDCCM&H/U • Defective ABS wheel speed sensor or sensor gap • Brake caliper • Brake pad • Road surface (uneven) • Tire specifications, tire wear and air pressures • Incorrect wiring or piping connections 	<ul style="list-style-type: none"> • Defective ABS wheel speed sensor or sensor gap • Defective steering angle sensor or improper neutral position • Defective yaw rate & G sensor or improper installation of VDCCM&H/U. • Master cylinder • Disc rotor • Brake pipe • Axle and wheels • Road with crowns or banks • Suspension play or fatigue (reduced damping)
<p>Vibration or noise</p> <ul style="list-style-type: none"> • When braking suddenly • When accelerating suddenly • While driving on a slippery road 	<p>Excessive brake pedal vibration</p>	<ul style="list-style-type: none"> • Road surface (uneven) • Incorrect wiring or piping connections 	<ul style="list-style-type: none"> • VDCCM&H/U • Brake booster • Suspension play or fatigue (reduced damping)
	<p>Noise from VDCH/U</p>	<ul style="list-style-type: none"> • VDCCM&H/U (mount bushing) • Defective ABS wheel speed sensor or sensor gap • Brake pipe 	<ul style="list-style-type: none"> • VDCCM&H/U • Defective steering angle sensor or improper neutral position • Defective yaw rate & G sensor or improper installation of VDCCM&H/U.
	<p>Noise from the front side of vehicle</p>	<ul style="list-style-type: none"> • VDCCM&H/U (mount bushing) • Defective ABS wheel speed sensor or sensor gap • Master cylinder • Brake caliper • Brake pad • Disc rotor • Brake pipe • Brake booster • Suspension play or fatigue (reduced damping) 	<ul style="list-style-type: none"> • Axle and wheels • Tire specifications, tire wear and air pressures
	<p>Noise from the rear side of vehicle</p>	<ul style="list-style-type: none"> • Defective ABS wheel speed sensor or sensor gap • Brake caliper • Brake pad • Disc rotor • Parking brake • Brake pipe • Suspension play or fatigue (reduced damping) 	<ul style="list-style-type: none"> • Axle and wheels • Tire specifications, tire wear and air pressures

<p>Engine does not accelerate or goes into a stall when accelerating suddenly or driving on a slippery surface.</p>	<ul style="list-style-type: none"> • VDCCM&H/U • Defective ABS wheel speed sensor or sensor gap • Master cylinder • Brake caliper • Parking brake • Incorrect wiring or piping 	<ul style="list-style-type: none"> • Defective steering angle sensor or improper neutral position • Defective yaw rate & G sensor or improper installation of VDCCM&H/U. • Brake pad • Brake pipe 	
<p>Poor change-direction-operation stability of TCS</p>	<p>Deviation to right or left direction</p>	<ul style="list-style-type: none"> • VDCCM&H/U • Defective ABS wheel speed sensor or sensor gap • Defective steering angle sensor or improper neutral position • Defective yaw rate & G sensor or improper installation of VDCCM&H/U. • Brake caliper • Brake pad • Wheel alignment • Road surface (uneven) • Road with crowns or banks • Tire specifications, tire wear and air pressures • Incorrect wiring or piping connections 	<ul style="list-style-type: none"> • Disc rotor • Brake pipe • Axle and wheels • Suspension play or fatigue (reduced damping)
	<p>Vehicle spin</p>	<ul style="list-style-type: none"> • VDCCM&H/U • Defective ABS wheel speed sensor or sensor gap • Defective steering angle sensor or improper neutral position • Defective yaw rate & G sensor or improper installation of VDCCM&H/U. • Brake pad • Tire specifications, tire wear and air pressures • Incorrect wiring or piping connections 	<ul style="list-style-type: none"> • Brake caliper • Brake pipe
<p>Steering wheel drag while driving</p>		<ul style="list-style-type: none"> • VDCCM&H/U • Defective ABS wheel speed sensor or sensor gap • Defective steering angle sensor or improper neutral position 	<ul style="list-style-type: none"> • Brake caliper • Brake pad • Disc rotor • Wheel alignment • Road surface (uneven) • Road with crowns or banks

	<ul style="list-style-type: none"> • Defective yaw rate & G sensor or improper installation of VDCCM&H/U. • Incorrect wiring or piping connections • Power steering system 	<ul style="list-style-type: none"> • Suspension play or fatigue (reduced damping) • Tire specifications, tire wear and air pressures
<p>VDC operates while driving normally.</p>	<ul style="list-style-type: none"> • VDCCM&H/U • Defective ABS wheel speed sensor or sensor gap • Defective steering angle sensor or improper neutral position • Defective yaw rate & G sensor or improper installation of VDCCM&H/U. • Wheel alignment • Road surface (uneven) • Road with crowns or banks • Suspension play or fatigue (reduced damping) • Tire specifications, tire wear and air pressures • Incorrect wiring or piping connections • Power steering system 	
<p>VDC OFF indicator light does not illuminate when the VDC OFF switch is depressed.</p> <p>Note: When pressing VDC OFF switch for 30 seconds or more, VDC OFF indicator light goes off and cannot operate any more. When turning the ignition switch from OFF to ON, the previous status is restored.</p>	<ul style="list-style-type: none"> • Harness • Combination meter • VDC OFF switch 	

BRAKE CONTROL (DIAGNOSTICS) > Inspection Mode

PROCEDURE

Reproduce the malfunction occurrence condition as much as possible.









Drive the vehicle at least ten minutes.






Note:






Make sure the vehicle is not dragged to one side under usual driving condition.










BRAKE CONTROL (DIAGNOSTICS) > List of Diagnostic Trouble Code (DTC)










LIST










DTC	Item	Content of diagnosis	Reference
C1211	FRONT RIGHT ABS SENSOR CIRCUIT	Open/high input of front ABS wheel speed sensor RH	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1211 FRONT RIGHT ABS SENSOR CIRCUIT.
C1212	FRONT RIGHT ABS SENSOR SIGNAL	Front ABS wheel speed sensor RH signal malfunction	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1212 FRONT RIGHT ABS SENSOR SIGNAL.
C1221	FRONT LEFT ABS SENSOR CIRCUIT	Open/high input of front ABS wheel speed sensor LH	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1221 FRONT LEFT ABS SENSOR CIRCUIT.
C1222	FRONT LEFT ABS SENSOR SIGNAL	Front ABS wheel speed sensor LH signal malfunction	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1222 FRONT LEFT ABS SENSOR SIGNAL.
C1231	REAR RIGHT ABS SENSOR CIRCUIT	Open/high input of rear ABS wheel speed sensor RH	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1231 REAR RIGHT ABS SENSOR CIRCUIT.
C1232	REAR RIGHT ABS SENSOR SIGNAL	Rear ABS wheel speed sensor RH signal malfunction	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1232 REAR RIGHT ABS SENSOR SIGNAL.
C1241	REAR LEFT ABS SENSOR CIRCUIT	Open/high input of rear ABS wheel speed sensor LH	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1241 REAR LEFT ABS SENSOR CIRCUIT.
C1242	REAR LEFT ABS SENSOR SIGNAL	Rear ABS wheel speed sensor LH signal malfunction	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1242 REAR LEFT ABS SENSOR SIGNAL.









C1251	WHEEL SPEED SENSOR SYSTEM	Wheel speed sensor malfunction	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1251 WHEEL SPEED SENSOR SYSTEM.
C1252	WHEEL SPEED SENSOR SIGNAL OF ONE OF THE WHEELS	ABS wheel speed sensor signal malfunction in one of four wheels	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1252 WHEEL SPEED SENSOR SIGNAL OF ONE OF THE WHEELS.
C1311	FR HOLD VALVE	Front inlet solenoid valve RH malfunction in VDCCM&H/U	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1311 FR HOLD VALVE.
C1312	FR PRESSURE REDUCING VALVE	Front outlet solenoid valve RH malfunction in VDCCM&H/U	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1312 FR PRESSURE REDUCING VALVE.
C1321	FL HOLD VALVE	Front inlet solenoid valve LH malfunction in VDCCM&H/U	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1321 FL HOLD VALVE.
C1322	FL PRESSURE REDUCING VALVE	Front outlet solenoid valve LH malfunction in VDCCM&H/U	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1322 FL PRESSURE REDUCING VALVE.
C1331	RR HOLD VALVE	Rear inlet solenoid valve RH malfunction in VDCCM&H/U	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1331 RR HOLD VALVE.
C1332	RR PRESSURE REDUCING VALVE	Rear outlet solenoid valve RH malfunction in VDCCM&H/U	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1332 RR PRESSURE REDUCING VALVE.
C1341	RL HOLD VALVE	Rear inlet solenoid valve LH malfunction in VDCCM&H/U	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble




			Code (DTC)>DTC C1341 RL HOLD VALVE.
C1342	RL PRESSURE REDUCING VALVE	Rear outlet solenoid valve LH malfunction in VDCCM&H/U	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1342 RL PRESSURE REDUCING VALVE.
C1351	NORMAL OPENING VALVE 1	Secondary cut valve malfunction in VDCCM&H/U	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1351 NORMAL OPENING VALVE 1.
C1352	NORMAL OPENING VALVE 2	Primary cut valve malfunction in VDCCM&H/U	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1352 NORMAL OPENING VALVE 2.
C1361	NORMAL CLOSING VALVE 1	Secondary suction valve malfunction in VDCCM&H/U	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1361 NORMAL CLOSING VALVE 1.
C1362	NORMAL CLOSING VALVE 2	Primary suction valve malfunction in VDCCM&H/U	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.
C1411	ELECTRICAL CONTROL MODULE	VDC control module malfunction	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1411 ELECTRICAL CONTROL MODULE.
C1412	SELECTED PARAMETER	VDC control module parameter failure	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1412 SELECTED PARAMETER.
C1413	POWER SUPPLY VOLTAGE	Power voltage malfunction	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1413 POWER SUPPLY VOLTAGE.
C1422	VDC INTERRUPTION	VDC interrupted due to some reasons of the	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic

	FOR ENGINE CONVENIENCE	engine	Procedure with Diagnostic Trouble Code (DTC)>DTC C1422 VDC INTERRUPTION FOR ENGINE CONVENIENCE.
C1423	DIFFERENT ECU SPECIFICATIONS	Different VDC control module specification	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1423 DIFFERENT ECU SPECIFICATIONS.
C1424	ECM	Engine control module is faulty	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1424 ECM.
C1431	AT	Transmission control module is faulty	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1431 AT.
C1432	DIFFERENT ECU SPECIFICATIONS	Different VDC control module specification	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1432 DIFFERENT ECU SPECIFICATIONS.
C1441	EyeSight REQUEST PRESSURE ABNORMAL	EyeSight system malfunction	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1441 EyeSight REQUEST PRESSURE ABNORMAL.
C1511	VALVE RELAY	Defective valve relay	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1511 VALVE RELAY.
C1512	VALVE SYSTEM	Defective valve system	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1512 VALVE SYSTEM.
C1521	MOTOR RELAY	Motor relay malfunction	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1521 MOTOR RELAY.
C1531	BLS OFF STUCK	Stop light switch malfunction	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic

			Procedure with Diagnostic Trouble Code (DTC)>DTC C1531 BLS OFF STUCK.
C1532	BLS ON STUCK	Stop light switch malfunction	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1532 BLS ON STUCK.
C1541	CLUTCH OFF FAULT	Abnormal clutch signal	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1541 CLUTCH OFF FAULT.
C1542	CLUTCH ON FAULT	Abnormal clutch signal	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1542 CLUTCH ON FAULT.
C1561	REVERSE OFF FAULT	Abnormal reverse signal	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1561 REVERSE OFF FAULT.
C1562	REVERSE ON FAULT	Abnormal reverse signal	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1562 REVERSE ON FAULT.
C1571	BRAKE LAMP RELAY OFF STUCK	Brake light relay malfunction	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1571 BRAKE LAMP RELAY OFF STUCK.
C1572	BRAKE LAMP RELAY ON STUCK	Brake light relay malfunction	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1572 BRAKE LAMP RELAY ON STUCK.
C1711	STEERING ANGLE SENSOR	Defective steering angle sensor	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1711 STEERING ANGLE SENSOR.
C1721	YAW RATE SENSOR	Defective yaw rate sensor	 Ref. to BRAKE CONTROL

			(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1721 YAW RATE SENSOR.
C1731	G SENSOR ABNORMAL	Defective G sensor	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1731 G SENSOR ABNORMAL.
C1732	LATERAL G SENSOR	Defective lateral G sensor	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1732 LATERAL G SENSOR.
C1733	LONGITUDINAL G SENSOR	Defective longitudinal G sensor	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1733 LONGITUDINAL G SENSOR.
C1741	PRESSURE SENSOR	Defective pressure sensor	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1741 PRESSURE SENSOR.
C1742	WHEEL CYLINDER PRESSURE SENSOR	Defective pressure sensor	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1742 WHEEL CYLINDER PRESSURE SENSOR.
C1811	SYSTEM	System malfunction	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1811 SYSTEM.
C1821	BRAKE TEMPERATURE ABNORMAL	Defective VDCCM&H/U	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1821 BRAKE TEMPERATURE ABNORMAL.
U0073	CAN FAILURE, BUS 'OFF' DETECTION	Defective CAN communication	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0100	LOST	Defective CAN	 Ref. to BRAKE CONTROL

	COMMUNICATION WITH ECM/PCM "A"	communication	(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0101	LOST COMMUNICATION WITH TCM	Defective CAN communication	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0123	LOST COMMUNICATION WITH YAW RATE SENSOR MODULE	Defective CAN communication	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0123 LOST COMMUNICATION WITH YAW RATE SENSOR MODULE.
U0126	LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE	Defective CAN communication	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0126 LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE.
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	Defective CAN communication	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	Defective CAN communication	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".
U0402	INVALID DATA RECEIVED FROM TCM	Defective CAN communication	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0402 INVALID DATA RECEIVED FROM TCM.
U0422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE	Defective CAN communication	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE.
U0428	INVALID DATA	Defective CAN	 Ref. to BRAKE CONTROL


	RECEIVED FROM STEERING ANGLE SENSOR MODULE	communication	(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0428 INVALID DATA RECEIVED FROM STEERING ANGLE SENSOR MODULE.
U0513	INVALID DATA RECEIVED FROM YAW RATE SENSOR MODULE	Defective CAN communication	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0513 INVALID DATA RECEIVED FROM YAW RATE SENSOR MODULE.
U1235	LOST COMMUNICATION WITH EyeSight	Defective CAN communication	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1235 LOST COMMUNICATION WITH EyeSight.
U1433	INVALID DATA RECEIVED FROM EyeSight	Defective CAN communication	 Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1433 INVALID DATA RECEIVED FROM EyeSight.

BRAKE CONTROL (DIAGNOSTICS) > Read Diagnostic Trouble Code (DTC)

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Brake Control].
5. On [Select Function] display, select [DTC].

Note:

- For details concerning the DTC, refer to “List of Diagnostic Trouble Code (DTC)”.
 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)
- For detailed operation procedures, refer to “Application help”.

INSPECTION

1. COMMUNICATION FOR INITIALIZING IMPOSSIBLE

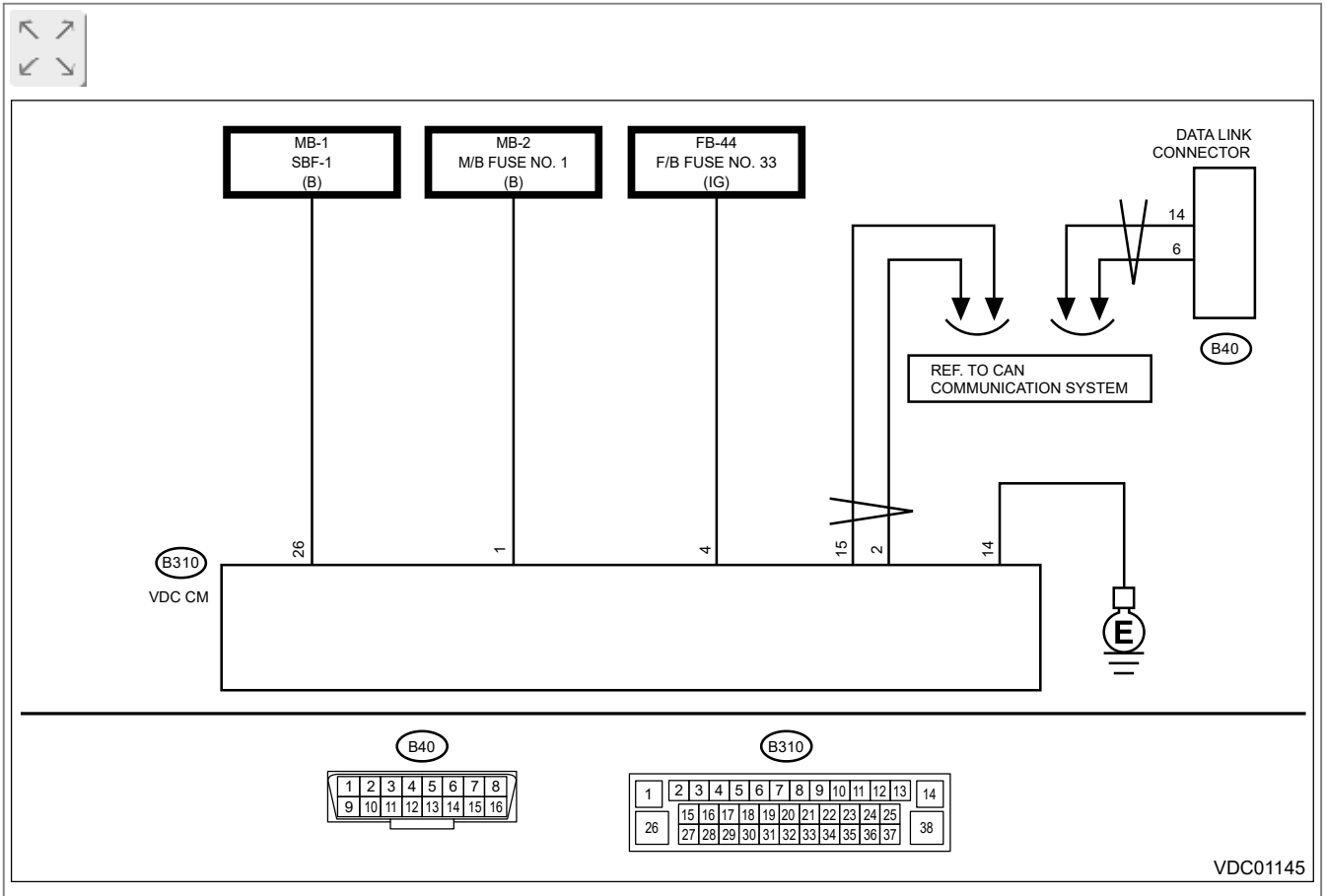
Detecting condition:

Defective harness connector

Trouble symptom:

Communication is impossible between VDC and Subaru Select Monitor.

WIRING DIAGRAM:



1. CHECK IGNITION SWITCH.

Is the ignition switch ON?

Yes

[Go to 2.](#)

No

Turn the ignition switch to ON, and select VDC using the Subaru Select Monitor.

2. CHECK BATTERY.

1. Turn the ignition switch to OFF.
2. Measure the battery voltage.

Is the voltage 11 V or more?

Yes

 [Go to 3.](#)

No

Charge or replace the battery.

3. CHECK BATTERY TERMINAL.



Is there poor contact at battery terminal?

Yes

Replace or tighten the battery terminal.

No

 [Go to 4.](#)

4. CHECK INSTALLATION OF VDCCM&H/U CONNECTOR.



Turn the ignition switch to OFF.

Is the VDCCM&H/U connector inserted into VDCCM&H/U until the clamp locks onto it?

Yes


 [Go to 5.](#)

No

Insert VDCCM&H/U connector into VDCCM&H/U.


5. CHECK LAN SYSTEM.



Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is there any fault in LAN system?

Yes

Perform the diagnosis according to DTC for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


 [Go to 6.](#)

6. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to ON.
2. Check whether communication to VDC system can be executed normally.

Is the [Select Function] display displayed?

Yes

Check the DTC in VDC system.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 7.](#)

7. CHECK SUBARU SELECT MONITOR COMMUNICATION.

Connect the Subaru Select Monitor to another vehicle to check whether the communication for initializing can be executed normally.

Does the Subaru Select Monitor communicate normally?

Yes

 [Go to 8.](#)

No

Repair or replace the Subaru Select Monitor.

8. CHECK POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to ON. (Engine OFF)
2. Measure the ignition power supply voltage between VDCCM&H/U connector and chassis ground.

Connector & terminal

(B310) No. 4 (+) — Chassis ground (—):

(B310) No. 1 (+) — Chassis ground (—):

(B310) No. 26 (+) — Chassis ground (—):

Is the voltage 10 — 15 V?

Yes

 [Go to 9.](#)

No

Repair open circuit in harness between VDCCM&H/U and battery.

9. CHECK HARNESS CONNECTOR BETWEEN VDCCM&H/U AND CHASSIS GROUND.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from the VDCCM&H/U.
3. Measure the resistance of harness between VDCCM&H/U connector and chassis ground.

Connector & terminal

(B310) No. 14 — Chassis ground:

Is the resistance less than 10 Ω?

Yes

 [Go to 10.](#)

No

Repair the open circuit of VDCCM&H/U ground circuit and poor contact of connector.

10. CHECK POOR CONTACT OF CONNECTOR.




Is there poor contact of control module power supply, ground circuit and data link connector?

Yes

Repair the connector.

No

Replace the VDCCM&H/U.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\).](#)

BRAKE CONTROL (DIAGNOSTICS) > Subaru Select Monitor

OPERATION

1. HOW TO USE SUBARU SELECT MONITOR

For detailed operation procedures, refer to "Application help".





2. DATA MONITOR

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Brake Control].
5. On [Select Function] display, select [Data monitor].

Display	Contents to be displayed	Unit of measure
FR Wheel Speed	Wheel speed detected by front ABS wheel speed sensor RH is displayed.	km/h or MPH
FL Wheel Speed	Wheel speed detected by front ABS wheel speed sensor LH is displayed.	km/h or MPH
RR Wheel Speed	Wheel speed detected by rear ABS wheel speed sensor RH is displayed.	km/h or MPH
RL Wheel Speed	Wheel speed detected by rear ABS wheel speed sensor LH is displayed.	km/h or MPH
Steering Angle Sensor	Steering angle detected by steering angle sensor is displayed.	deg
Yaw Rate Sensor	Vehicle angular speed detected by yaw rate sensor is displayed.	deg/s
Pressure Sensor	Brake fluid pressure detected by pressure sensor is displayed.	bar
Longitudinal G Sensor	Vehicle forward/reverse acceleration detected by the forward/reverse G sensor is displayed.	m/s ²
Lateral G Sensor	Vehicle lateral acceleration detected by lateral G sensor is displayed.	m/s ²
Power Supply Voltage	Voltage supplied to VDCCM&H/U is displayed.	V
M. Relay monitor Voltage	Voltage applied to the motor relay is displayed.	V
FL Wheel Cylinder Pressure Sensor Output	FL wheel cylinder brake fluid pressure detected by pressure sensor is displayed.	bar
FR Wheel Cylinder Pressure Sensor Output	FR wheel cylinder brake fluid pressure detected by pressure sensor is displayed.	bar
Motor Relay Signal	Motor relay operation signal is displayed.	ON or OFF
Valve Relay Signal	Valve relay operation signal is displayed.	ON or OFF
EBD Warning Light	ON operation of the EBD warning light is displayed.	ON or OFF

ABS Warning Lamp	ON operation of the ABS warning light is displayed.	ON or OFF
VDC Warning Lamp	ON operation of the VDC warning light is displayed.	ON or OFF
EBD Control Flag	EBD operation condition is displayed.	ON or OFF
ABS Control Flag	ABS operation condition is displayed.	ON or OFF
TCS Control Flag	TCS operation condition is displayed.	ON or OFF
VDC Control Flag	VDC operation condition is displayed.	ON or OFF
E/G Control Stop Flag	Engine control command signal is displayed.	1 or 0
Stop-Lamp Relay Drive Signal	Brake light relay driving signal is displayed.	ON or OFF
X Mode	The status of X mode is displayed.	ON or OFF
VDC-OFF Light	ON/OFF condition of VDC OFF indicator light is displayed.	ON or OFF
OFF SW Signal	Operation condition of VDC OFF switch is displayed.	ON or OFF
Brake Light Switch	Brake ON/OFF is displayed.	ON or OFF
Clutch switch	Clutch ON/OFF is displayed. (For MT model only. For AT model: OFF fixed)	ON or OFF
Reverse Signal	Reverse gear ON/OFF is displayed. (For MT model only. For AT model: OFF fixed)	ON or OFF

3. FUNCTION CHECK

Display	Contents of display	Index No.
ABS Sequence Control Mode	Operate the valve and pump motor continuously to perform the ABS sequence control.	 Ref. to VEHICLE DYNAMICS CONTROL (VDC)>ABS Sequence Control.
VDC Check Mode	Operate the valve and pump motor continuously to perform the VDC sequence control.	 Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Sequence Control.
VSC(VDC) Centering Mode	Set the steering angle sensor neutral position, and the lateral G sensor and longitudinal G sensor 0 (zero) point.	 Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.
Brake Lamp Lighting Operation	Activate the brake light relay to illuminate the brake light.	 Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Brake Lamp Relay>OPERATION > BRAKE LAMP LIGHTING OPERATION MODE BY SUBARU SELECT MONITOR.

4. FREEZE FRAME DATA

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Brake Control].
5. On [Select Function] display, select [DTC].

6. On [DTC] display, select [FFD].

Display	Contents to be displayed	Unit of measure
Classification	The recorded failure code is displayed.	—
FR Wheel Speed	Wheel speed detected by front ABS wheel speed sensor RH is displayed.	km/h or MPH
FL Wheel Speed	Wheel speed detected by front ABS wheel speed sensor LH is displayed.	km/h or MPH
RR Wheel Speed	Wheel speed detected by rear ABS wheel speed sensor RH is displayed.	km/h or MPH
RL Wheel Speed	Wheel speed detected by rear ABS wheel speed sensor LH is displayed.	km/h or MPH
Vehicle Speed Sensor	Vehicle speed calculated by VDC control module is displayed.	km/h or MPH
Steering Angle Sensor	Steering angle detected by steering angle sensor is displayed.	deg
Yaw Rate Sensor	Vehicle angular speed detected by yaw rate sensor is displayed.	deg/s
Pressure Sensor	Brake fluid pressure detected by pressure sensor is displayed.	bar
Longitudinal G Sensor	Vehicle forward/reverse acceleration detected by the forward/reverse G sensor is displayed.	m/s ²
Lateral G Sensor	Vehicle lateral acceleration detected by lateral G sensor is displayed.	m/s ²
Power Supply Voltage	Voltage supplied to VDC control module is displayed.	V
Acceleration Pedal Position	Accelerator pedal opening angle is displayed.	%
Engine Speed	Engine speed on malfunction occurrence is displayed.	rpm
FL Wheel Cylinder Pressure Sensor Output	FL wheel cylinder brake fluid pressure detected by pressure sensor is displayed.	bar
FR Wheel Cylinder Pressure Sensor Output	FR wheel cylinder brake fluid pressure detected by pressure sensor is displayed.	bar
Steering angle flag	Whether the absolute angle of the steering angle sensor was determined is displayed.	Recognition in progress or failed
EBD Control Flag	EBD control condition is displayed.	ON or OFF
ABS Control Flag	ABS control condition is displayed.	ON or OFF
TCS Control Flag	TCS control condition is displayed.	ON or OFF
VDC Control Flag	VDC control condition is displayed.	ON or OFF
E/G Control Stop Flag	Engine control command signal is displayed.	1 or 0
X Mode	The status of X mode is displayed.	ON or OFF
OFF Switch Detection	ON/OFF condition of the VDC operated by the driver is displayed.	ON or OFF
Brake Light Switch	Brake ON/OFF is displayed.	ON or OFF

Clutch switch	Clutch ON/OFF is displayed. (For MT model only. For AT model: OFF fixed)	ON or OFF
Reverse Signal	Reverse gear ON/OFF is displayed. (For MT model only. For AT model: OFF fixed)	ON or OFF

Note:


- Freeze frame data stored at the time of trouble occurrence is shown on the display.
- Each time a trouble occurs, the latest information is stored in the freeze frame data in memory.
- For detailed operation procedures, refer to "Application help".


5. PARAMETER SELECTION

Caution:

- Subaru Select Monitor is required for parameter selection.
- This function can be used for the replacement part of VDCCM&H/U.


Note:

- When the VDCCM&H/U is replaced with a replacement part, be sure to perform the parameter selection/registration to the VDCCM&H/U using this function.
- To check the applied model, refer to the "Model number plate" attached to the vehicle.  [Ref. to IDENTIFICATION.](#)
- If you entered a wrong applied model, you can re-write it.
- When the registration has not been performed, the DTC code "Parameter" is detected together with the ABS/EBD/VDC warning light illumination.

1. Connect the Subaru Select Monitor.
2. On [Start] display, select [Diagnosis].
3. On [Vehicle selection] display, enter vehicle information and select [OK].
4. On [Main Menu] display, select [Each System].
5. On [Select System] display, select [Brake Control].
6. On [Select Function] display, select [Work Support].
7. On [Work Support] display, select [Selection of Parameter].
8. Check the applied model and option code indicated on the "Model number plate".  [Ref. to IDENTIFICATION.](#)
9. Enter the applied model of 7-digit alphanumeric characters and press the "Enter".
10. When the option code input screen appears after entering the applied model, enter the option code consisting of 4-digit alphanumeric characters, and press "Enter". When the option code is 3 digits, add "0" (zero) in front and enter the code as 4 digits.
11. When the confirmation screen indicating the vehicle information appears, check that the correct applied model and grade are displayed and click "OK".

Note:


When the displayed applied model and grade are different from those of the vehicle, perform registration operations again after clicking "OK".

12. Execute Clear Memory after parameter selection and registration operations because the DTC for "Parameter selection error" is memorized.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)

6. PARAMETER CHECK

Note:

The parameter data registered in the VDCCM is shown on the display.

1. Connect the Subaru Select Monitor.
2. On [Start] display, select [Diagnosis].
3. On [Vehicle selection] display, enter vehicle information and select [OK].
4. On [Main Menu] display, select [Each System].
5. On [Select System] display, select [Brake Control].
6. On [Select Function] display, select [Work Support].
7. On [Work Support] display, select [Confirm on parameter].
8. On the [Confirm on parameter] display screen, check that the applied model and grade of the target vehicle are included, and click "OK".
9. If the applied model and grade of the target vehicle are not included on the [Confirm on parameter] display, perform "parameter selection and registration".  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > PARAMETER SELECTION.](#)

BRAKE CONTROL (DIAGNOSTICS) > Warning Light Illumination Pattern

ABS WARNING LIGHT DOES NOT GO OFF

Detecting condition:

- Defective combination meter
- Defective engine
- Defective CAN communication

Trouble symptom:

ABS warning light does not go off when starting the engine.

1. READ DTC.

Read the DTC. [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is DTC displayed?

Yes

Perform the diagnosis according to DTC. [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 2.](#)

2. CHECK VDCCM.

Display the data monitor of VDCCM using Subaru Select Monitor.

Is [ABS Warning Lamp] ON?

Yes

[Go to 3.](#)

No

[Go to 4.](#)

3. READ DTC.


Read the DTC after driving the vehicle at 40 km/h (25 MPH) or more.

Is DTC displayed?

Yes

Perform the diagnosis according to DTC. [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


 [Go to 4.](#)

4. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is there any fault in LAN system?


Yes

Perform the diagnosis according to DTC for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


 [Go to 5.](#)

5. CHECK COMBINATION METER.


Check the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.](#)

Is the check result OK?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter>REMOVAL.](#)

BRAKE CONTROL (DIAGNOSTICS) > Warning Light Illumination Pattern

BRAKE WARNING LIGHT DOES NOT GO OFF


Detecting condition:

- Brake warning light circuit is shorted.
- Defective sensor/connector
- Defective CAN communication

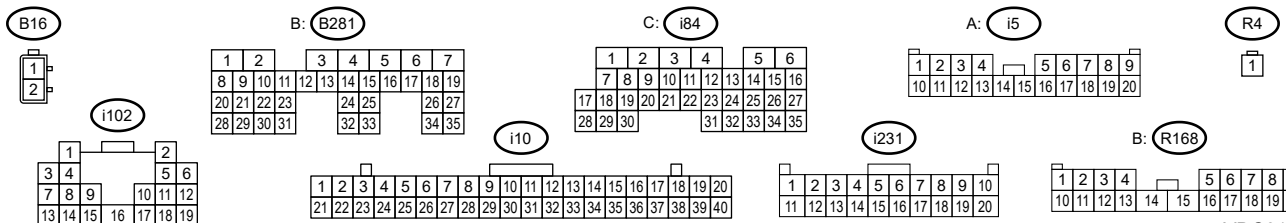
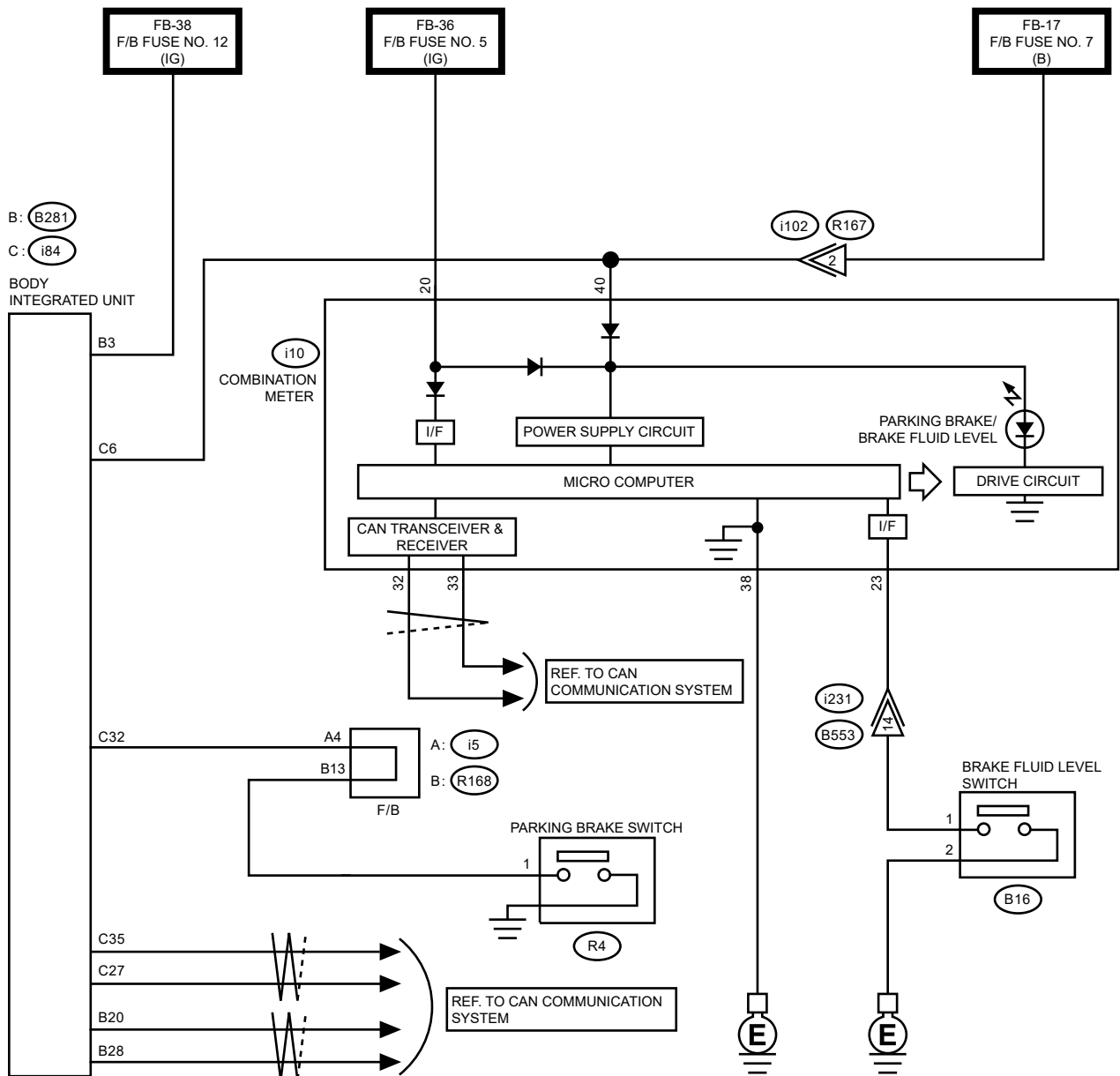
Trouble symptom:

After starting the engine, the brake warning light does not go off even though the parking lever is released.

Wiring diagram:

Parking brake / brake fluid level warning light system  [Ref. to WIRING SYSTEM>Parking Brake / Brake Fluid Level Warning Light System.](#)





VDC01204


1. CHECK INSTALLATION OF VDCCM&H/U CONNECTOR.



1. Turn the ignition switch to OFF.
2. Check that the VDCCM&H/U connector is inserted until it is locked by clamp.

Is the connector firmly inserted?


Yes

 [Go to 2.](#)

No


Insert the VDCCM&H/U connector until it is locked by clamp.

2. READ DTC.

Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is DTC displayed?


Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


 [Go to 3.](#)

3. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is there any fault in LAN system?

Yes

Perform the diagnosis according to DTC for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 4.](#)

4. CHECK BRAKE FLUID AMOUNT.

Check the amount of brake fluid in the reservoir tank of master cylinder.

Does the level of the brake fluid amount fall between the lines of "MAX" and "MIN"?

Yes

 [Go to 5.](#)

No

Replenish brake fluid to the specified value.

5. CHECK BRAKE FLUID LEVEL SWITCH.




1. Turn the ignition switch to OFF.
2. Disconnect the level switch connector (B16) from master cylinder.
3. Measure the resistance of master cylinder terminals.

Terminals

No. 1 —No. 2:

Is the resistance 1 MΩ or more?

Yes

 [Go to 6.](#)

No

Replace the master cylinder.  [Ref. to BRAKE>Master Cylinder.](#)

6. CHECK GROUND SHORT OF HARNESS.



1. Disconnect the connector (i10) from combination meter.
2. Measure the resistance between combination meter connector and chassis ground.

Connector & terminal

(i10) No. 23 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 7.](#)

No

Repair the harness between combination meter and brake fluid level switch.


7. CHECK PARKING BRAKE SWITCH.



1. Disconnect the connector (R4) from parking brake switch.
2. Release the parking brake.
3. Measure the resistance between parking brake switch terminal and chassis ground.

Is the resistance 1 MΩ or more?

Yes

 [Go to 8.](#)

No

Replace the parking brake switch.

8. CHECK GROUND SHORT OF HARNESS.



1. Disconnect the connector (i84) from body integrated unit.
2. Measure the resistance between body integrated unit connector and chassis ground.

Connector & terminal

(i84) No. 32 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 9.](#)

No

Repair the harness between body integrated unit and parking brake switch.

9. CHECK POOR CONTACT OF CONNECTOR.




Check for poor contact of all connectors.

Is there poor contact?

Yes


Repair the connector.

No

 [Go to 10.](#)


10. CHECK COMBINATION METER.



Check the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.](#)

Is the check result OK?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

BRAKE CONTROL (DIAGNOSTICS) > Warning Light Illumination Pattern

HILL START ASSIST WARNING LIGHT, HILL DESCENT CONTROL INDICATOR LIGHT DOES NOT COME ON

Detecting condition:

Defective combination meter

Trouble symptom:

When the ignition switch is turned to ON (engine OFF), hill start assist warning light and hill descent control indicator light do not illuminate.

1. CHECK OTHER INDICATOR LIGHT.

Turn the ignition switch to ON. (Engine OFF)

Do other indicator lights illuminate?

Yes

[Go to 2.](#)

No

Check the combination meter. [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.](#)

2. READ DTC.

Read the DTC.

Is DTC displayed? [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Yes

Perform the diagnosis according to DTC. [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 3.](#)


3. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)


Is there any fault in LAN system?




Yes

Perform the diagnosis according to DTC for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


 [Go to 4.](#)

4. CHECK COMBINATION METER.


Check the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.](#)

Is the check result OK?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

BRAKE CONTROL (DIAGNOSTICS) > Warning Light Illumination Pattern

HILL START ASSIST WARNING LIGHT, HILL DESCENT CONTROL INDICATOR LIGHT DOES NOT GO OFF


Detecting condition:

- Defective combination meter
- Defective CAN communication

Trouble symptom:


The hill start assist warning light and the hill descent control indicator light do not go off when starting the engine.

1. READ DTC.


Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is DTC displayed?


Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


 [Go to 2.](#)

2. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is there any fault in LAN system?


Yes

Perform the diagnosis according to DTC for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


 [Go to 3.](#)

3. CHECK COMBINATION METER.

Check the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.](#)

Is the check result OK?

Yes

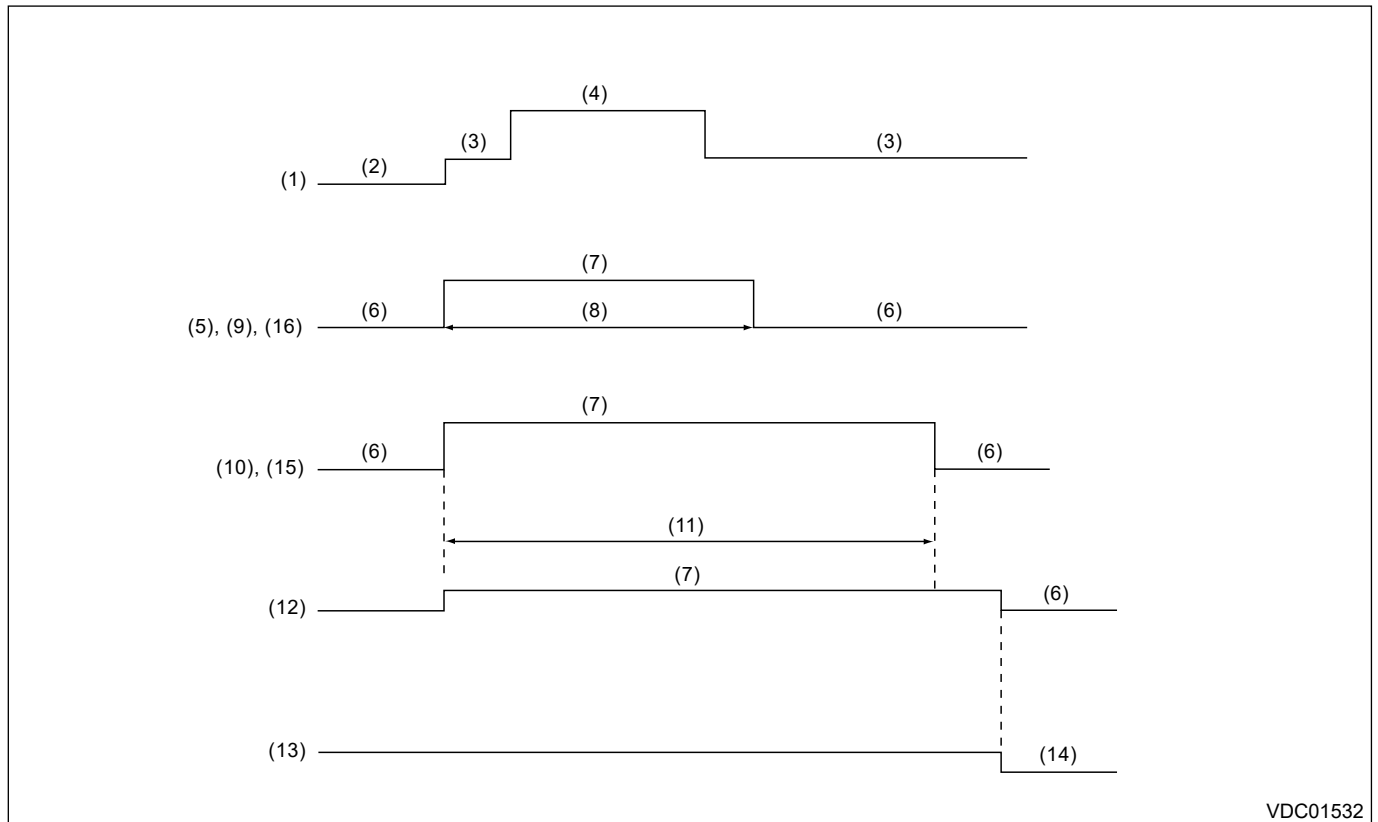
Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter>REMOVAL.](#)

BRAKE CONTROL (DIAGNOSTICS) > Warning Light Illumination Pattern

INSPECTION







VDC01532

- | | | |
|-----------------------|--|---|
| (1) Ignition switch | (7) Light ON | (13) Parking brake |
| (2) OFF | (8) 2 seconds | (14) Released |
| (3) ON | (9) VDC OFF indicator light | (15) Hill start assist warning light |
| (4) Engine start | (10) VDC warning light & VDC indicator light | (16) Hill descent control indicator light |
| (5) ABS warning light | (11) 2 seconds or more | |
| (6) Light OFF | (12) Brake warning light (EBD warning light) | |



Note:

Hill start assist warning light always illuminates when the hill start assist is in the OFF mode.

- When warning lights or indicator lights do not illuminate in accordance with this illumination pattern, there must be an electrical malfunction.
- When the warning lights or indicator lights remain constantly OFF, check the combination meter circuit. [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Warning Light Illumination Pattern>EBD WARNING LIGHT, ABS WARNING, VDC OFF INDICATOR LIGHT, VDC WARNING LIGHT AND VDC INDICATOR LIGHT DO NOT COME ON.](#) [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Warning Light Illumination Pattern>HILL START ASSIST WARNING LIGHT, HILL DESCENT CONTROL INDICATOR LIGHT DOES NOT COME ON.](#)

3. When the ABS warning light, VDC OFF indicator light, VDC warning light & VDC indicator light, and hill start assist warning light do not go off, check the combination meter circuit or CAN communication circuit.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Warning Light Illumination Pattern>ABS WARNING LIGHT DOES NOT GO OFF.](#)  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Warning Light Illumination Pattern>VDC OFF INDICATOR LIGHT DOES NOT GO OFF.](#)  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Warning Light Illumination Pattern>VDC WARNING LIGHT AND VDC INDICATOR LIGHT DO NOT GO OFF.](#)  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Warning Light Illumination Pattern>HILL START ASSIST WARNING LIGHT, HILL DESCENT CONTROL INDICATOR LIGHT DOES NOT GO OFF.](#)

Note:

- **Even though the ABS warning light, and the VDC warning light & VDC indicator light do not go off in 2 seconds after illuminating, the ABS and VDC functions are normal if the warning lights go off while the vehicle is driven at approximately 38 km/h (23 MPH). However, while these lights are on, the functions with their warning lights illuminated do not operate.**
- **It may take several minutes before the VDC warning light & VDC indicator light goes off, if the vehicle is parked under low temperature for a specified time. This is not defective because it is resulted from low engine coolant temperature. Clear the memory because DTC may be recorded at this time.**  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)
- **With the vehicle jack-up/lift-up or set on free rollers, when the wheels lock or spin after starting the engine, ABS warning light, and VDC warning light & VDC indicator light may illuminate because VDCCM&H/U detects the abnormal conditions from ABS wheel speed sensor or longitudinal G sensor. In this case, this is not a malfunction. Clear the memory.**  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)

BRAKE CONTROL (DIAGNOSTICS) > Warning Light Illumination Pattern

VDC OFF INDICATOR LIGHT DOES NOT GO OFF

Detecting condition:

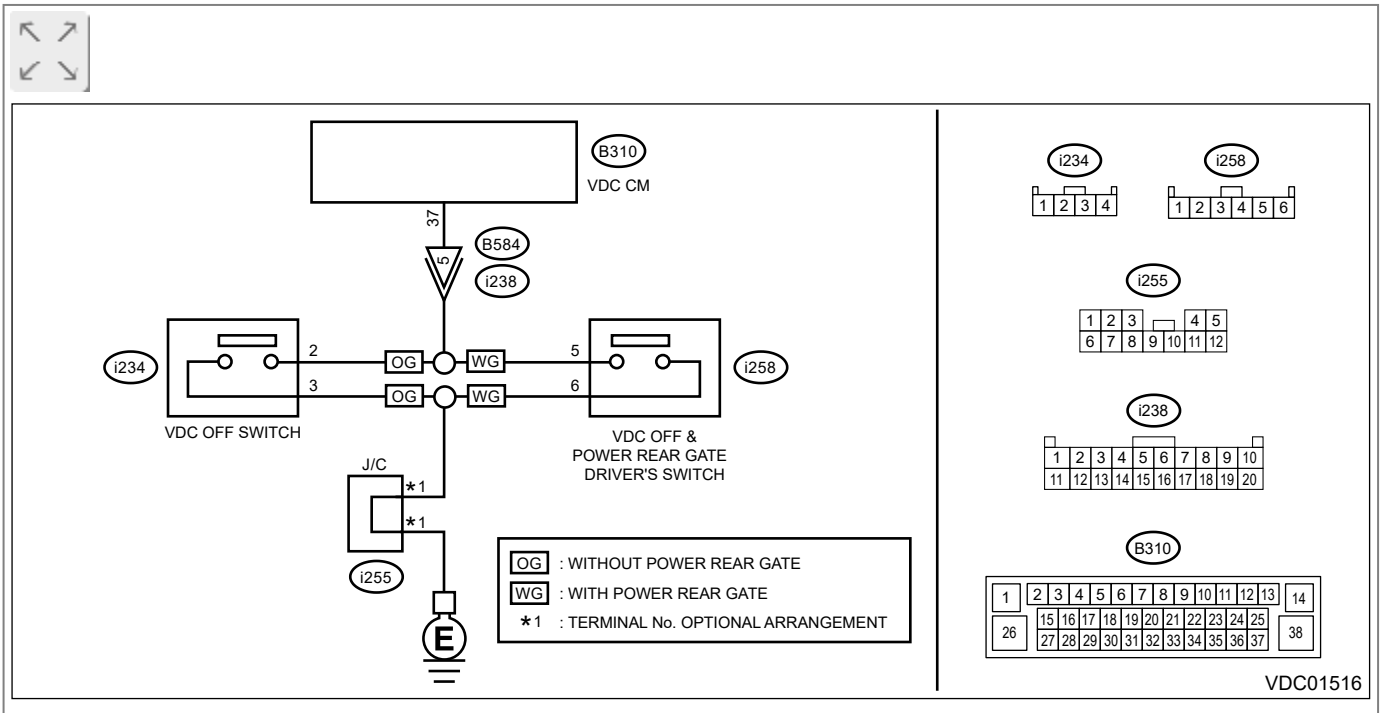
- Defective combination meter
- Defective CAN communication
- VDC OFF switch is shorted.

Trouble symptom:


VDC OFF indicator light does not go off when starting the engine.

Wiring diagram:

Vehicle dynamics control system  [Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.](#)




1. READ DTC.

Read the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is DTC displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


 [Go to 2.](#)

2. CHECK VDC OFF SWITCH.


Connect the Subaru Select Monitor, and display the data monitor of VDCCM with the engine started.

Does [OFF SW Signal] change according to operation of VDC OFF switch?


Yes

 [Go to 5.](#)

No

 [Go to 3.](#)

3. CHECK VDC OFF SWITCH.

Remove and check VDC OFF switch.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC OFF Switch.](#)

Is the check result OK?

Yes

 [Go to 4.](#)

No

Replace the VDC OFF switch.

4. CHECK VDC OFF SWITCH CIRCUIT.

1. Disconnect the connector from the VDCCM&H/U.
2. Measure the resistance between VDCCM&H/U connector and chassis ground.

Connector & terminal


(B310) No. 37 — Chassis ground:

Is the resistance less than 10 Ω ?


Yes

Check the VDC OFF switch circuit.

No


 [Go to 5.](#)

5. CHECK LAN SYSTEM.


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is there any fault in LAN system?


Yes

Perform the diagnosis according to DTC for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


 [Go to 6.](#)

6. CHECK COMBINATION METER.


Check the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.](#)

Is the check result OK?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter>REMOVAL.](#)

BRAKE CONTROL (DIAGNOSTICS) > Warning Light Illumination Pattern

VDC WARNING LIGHT AND VDC INDICATOR LIGHT DO NOT GO OFF

Detecting condition:

- Defective combination meter
- Defective engine
- Defective CAN communication

Trouble symptom:

VDC warning light and VDC indicator light do not go off when starting the engine.

1. READ DTC.

Read the DTC. [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is DTC displayed?

Yes

Perform the diagnosis according to DTC. [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 2.](#)

2. CHECK VDCCM.

Display the data monitor of VDCCM using Subaru Select Monitor.

Is [VDC Warning Lamp] ON?

Yes

[Go to 3.](#)

No

[Go to 4.](#)

3. READ DTC.


Read the DTC after driving the vehicle at 40 km/h (25 MPH) or more.

Is DTC displayed?

Yes

Perform the diagnosis according to DTC. [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


 [Go to 4.](#)

4. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is there any fault in LAN system?


Yes

Perform the diagnosis according to DTC for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


 [Go to 5.](#)

5. CHECK COMBINATION METER.


Check the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.](#)

Is the check result OK?

Yes

Replace the VDCCM only.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>REPLACEMENT.](#)

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter>REMOVAL.](#)

PROCEDURE

Caution:

- **Subaru Select Monitor is required for reading DTC, reading the current data and clearing the memory.**
- **Remove foreign matter (dust, water, oil, etc.) from the engine control module (ECM) connector when removing or installing.**

Note:

- **To check the harness for open or short circuits, shake problem spot or connector.**
- **Refer to “Check List for Interview”. [🔗 Ref. to BRAKE VACUUM PUMP \(DIAGNOSTICS\) >Check List for Interview.](#)**

1. CHECK PRE-INSPECTION.

1. Ask the customer when and how the trouble occurred using the interview check list. [🔗 Ref. to BRAKE VACUUM PUMP \(DIAGNOSTICS\) >Check List for Interview.](#)
2. Check the brake vacuum pump warning light.

Does the brake vacuum pump warning light illuminate?

<input type="button" value="Yes"/>	🔗 Go to 3.
<input type="button" value="No"/>	🔗 Go to 2.

2. BASIC INSPECTION.


Check the components which might affect the brake vacuum control. [🔗 Ref. to BRAKE VACUUM PUMP \(DIAGNOSTICS\) >General Description>INSPECTION.](#)

Is the check result OK?

<input type="button" value="Yes"/>	🔗 Go to 3.
<input type="button" value="No"/>	Repair or replace each component.


3. CHECK INDICATION OF DTC.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector.


3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Read the DTC.  [Ref. to BRAKE VACUUM PUMP \(DIAGNOSTICS\) >Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)
5. Record all DTC.

Is DTC displayed?

Yes

Record the DTC, time stamp and freeze frame data.  [Go to 5.](#)


Note:

- **For the time stamp, refer to LAN section.**  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>General Description>CAUTION > TIME STAMP.](#)
- **Depending on DTCs, time stamp may not be stored.**

No

 [Go to 4.](#)

4. PERFORM GENERAL DIAGNOSTICS.

Perform the inspection by referring to "General Diagnostic Table".  [Ref. to BRAKE VACUUM PUMP \(DIAGNOSTICS\) >General Diagnostic Table>INSPECTION.](#)

Is the check result OK?





Yes

Finish the diagnosis.

No

 [Go to 5.](#)

5. PERFORM DIAGNOSIS.

1. Correct the cause of trouble according to the DTC.  [Ref. to BRAKE VACUUM PUMP \(DIAGNOSTICS\) >List of Diagnostic Trouble Code \(DTC\)>LIST.](#)
2. Clear the memory.  [Ref. to BRAKE VACUUM PUMP \(DIAGNOSTICS\) >Clear memory>OPERATION.](#)
3. Perform the Inspection Mode.  [Ref. to BRAKE VACUUM PUMP \(DIAGNOSTICS\) >Inspection Mode>PROCEDURE.](#)
4. Read the DTC.  [Ref. to BRAKE VACUUM PUMP \(DIAGNOSTICS\) >Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)

Is DTC displayed?

Yes

Repeat step 5 until DTC is not shown.

No

Finish the diagnosis.

BRAKE VACUUM PUMP (DIAGNOSTICS) > Check List for Interview

CHECK

Check the following item about the vehicle’s state.

1. BRAKE VACUUM PUMP WARNING LIGHT STATUS



The brake vacuum pump warning light illuminates.	<input type="checkbox"/> Always <input type="checkbox"/> Sometimes <input type="checkbox"/> Only once <input type="checkbox"/> Does not illuminate • When/How long does it illuminate?		
Ignition key position	<input type="checkbox"/> LOCK <input type="checkbox"/> ACC <input type="checkbox"/> ON (before starting engine) <input type="checkbox"/> START <input type="checkbox"/> ON (after starting engine, engine is running) <input type="checkbox"/> ON (after starting engine, engine is at a standstill)		
Timing	<input type="checkbox"/> Immediately after turning the ignition switch to ON <input type="checkbox"/> Immediately after turning the ignition switch to START		
	<input type="checkbox"/> While accelerating	km/h	—
		MPH	—
	<input type="checkbox"/> While driving at a constant speed	km/h	MPH
	<input type="checkbox"/> While decelerating	km/h	—
		MPH	—

2. CONDITIONS UNDER WHICH TROUBLE OCCURS



Environment	a) Weather	<input type="checkbox"/> Fine <input type="checkbox"/> Cloudy <input type="checkbox"/> Rainy <input type="checkbox"/> Snowy <input type="checkbox"/> Others:
	b) Ambient temperature	°C (°F)
	c) Altitude	m (ft)
	d) Road	<input type="checkbox"/> Inner city <input type="checkbox"/> Suburbs <input type="checkbox"/> Highway

		<input type="checkbox"/> Local street <input type="checkbox"/> Uphill <input type="checkbox"/> Downhill <input type="checkbox"/> Paved road <input type="checkbox"/> Gravel road <input type="checkbox"/> Muddy road <input type="checkbox"/> Sandy place <input type="checkbox"/> Straight road <input type="checkbox"/> Sharp curve <input type="checkbox"/> Gentle curve <input type="checkbox"/> S-curve <input type="checkbox"/> Road with a slope on both sides <input type="checkbox"/> Others:	
Condition	a) Brakes	Deceleration: G	
		<input type="checkbox"/> continuous / <input type="checkbox"/> intermittent	
	b) Accelerator	Acceleration: G	
		<input type="checkbox"/> continuous / <input type="checkbox"/> intermittent	
	c) Vehicle speed	km/h	MPH
		<input type="checkbox"/> Advancing	<input type="checkbox"/> Immediately
<input type="checkbox"/> While accelerating		after starting the engine	
<input type="checkbox"/> While decelerating		<input type="checkbox"/> Idling, etc.	
<input type="checkbox"/> At low speed			
<input type="checkbox"/> When turning			
<input type="checkbox"/> Other:			

BRAKE VACUUM PUMP (DIAGNOSTICS) > Clear memory

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Brake Vacuum Pump].
5. On [Select Function] display, select [DTC].
6. On DTC display, select [Clear memory].

Note:

For detailed operation procedures, refer to “Application help”.

BRAKE VACUUM PUMP (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC 11 SENSOR OUTPUT OUT OF RANGE

DTC detecting condition:

Malfunction of brake booster pressure sensor output

Trouble symptom:

Brake vacuum pump does not operate.

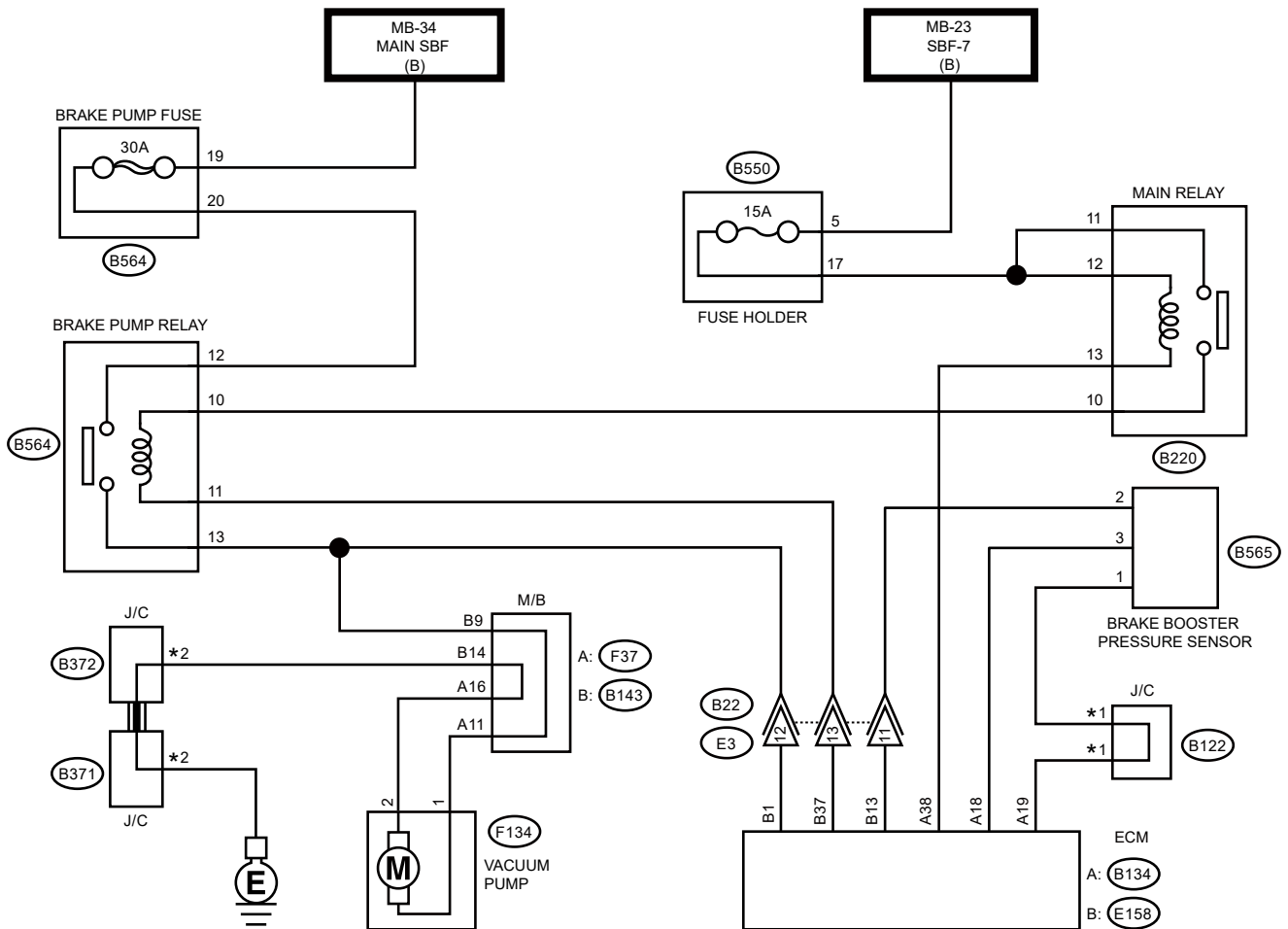
Caution:

Use the check board when measuring the ECM terminal voltage and resistance.

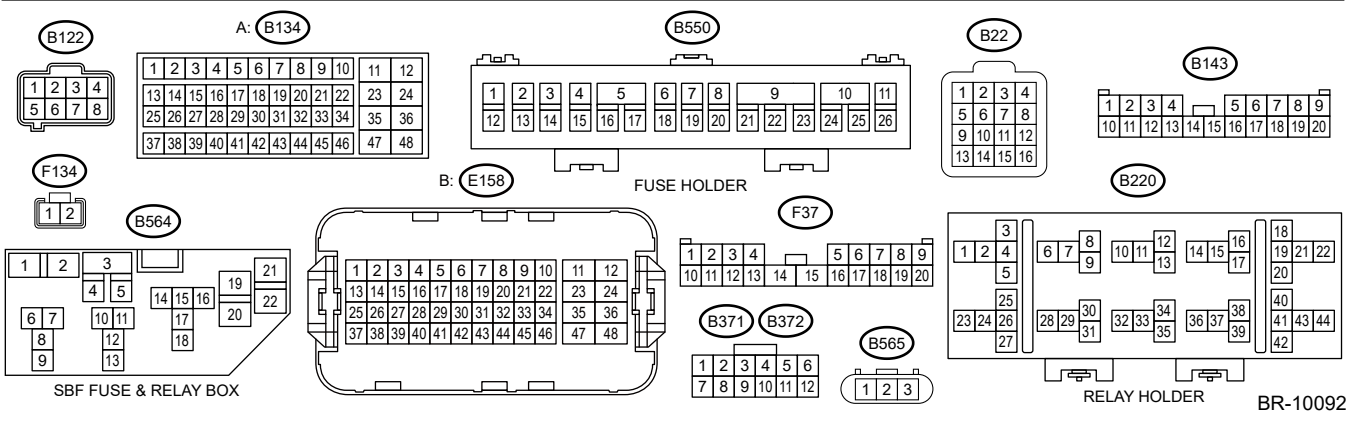
Wiring diagram:

Vacuum pump control system  [Ref. to WIRING SYSTEM>Vacuum Pump Control System>WIRING DIAGRAM.](#)





* 1 : TERMINAL No. OPTIONAL ARRANGEMENT
 * 2 : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 7, 8, 9, 10, 11 AND 12



1. CHECK BRAKE BOOSTER PRESSURE SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the brake booster pressure sensor connector.
3. Measure the resistance between brake booster pressure sensor terminals.

Terminals




No. 1 —No. 3:

No. 2 —No. 3:

Is the resistance 15 k Ω or less?

Yes

 [Go to 2.](#)

No

Replace the brake booster.  [Ref. to BRAKE>Brake Booster.](#)

2. CHECK HARNESS BETWEEN ECM AND BRAKE BOOSTER PRESSURE SENSOR CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and brake booster pressure sensor connector terminal.

Connector & terminal


(B134) No. 18 — (B565) No. 3:

(B134) No. 19 — (B565) No. 1:

(E158) No. 13 — (B565) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit of harness between ECM connector and brake booster pressure sensor connector terminal.

3. CHECK HARNESS BETWEEN ECM AND BRAKE BOOSTER PRESSURE SENSOR CONNECTOR.

Measure the resistance of harness between ECM connector and chassis ground.

Connector & terminal

(B134) No. 18 — Chassis ground:

(B134) No. 19 — Chassis ground:

(E158) No. 13 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair the short circuit to ground in harness between ECM connector and brake booster pressure sensor connector terminal.

4. CHECK HARNESS BETWEEN ECM AND BRAKE BOOSTER PRESSURE SENSOR CONNECTOR.



Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B134) No. 18 (+) — Chassis ground (–):

(B134) No. 19 (+) — Chassis ground (–):

(E158) No. 13 (+) — Chassis ground (–):

Is the voltage 0.5 V or less?

Yes

 [Go to 5.](#)

No

Repair the short circuit to power supply between the ECM connector and brake booster pressure sensor connector terminal.

5. CHECK BRAKE BOOSTER PRESSURE SENSOR POWER SUPPLY.



1. Connect the brake booster pressure sensor connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector terminals.

Connector & terminal


(B134) No. 18 (+) — (B134) No. 19 (–):

Is the voltage 4.75 — 5.25 V?

Yes


 [Go to 6.](#)

No

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

6. CHECK DATA MONITOR.




1. Connect the ECM connector.
2. Turn the ignition switch to ON.
3. Depress the brake pedal several times, until the pedal becomes firm.
4. Read the data monitor of brake vacuum pump system using Subaru Select Monitor.  [Ref. to BRAKE VACUUM PUMP \(DIAGNOSTICS\) >Subaru Select Monitor>OPERATION >DATA MONITOR.](#)

Is [Barometric Pressure] and [Brake Booster Pressure] –1 — +1 kPa?

Yes

Temporary poor contact occurs.

No

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

BRAKE VACUUM PUMP (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC 12 COMPARE ERROR IN OTHER SENSOR

DTC detecting condition:

Error in comparison with other brake booster relative pressure

Trouble symptom:

Brake vacuum pump does not operate.

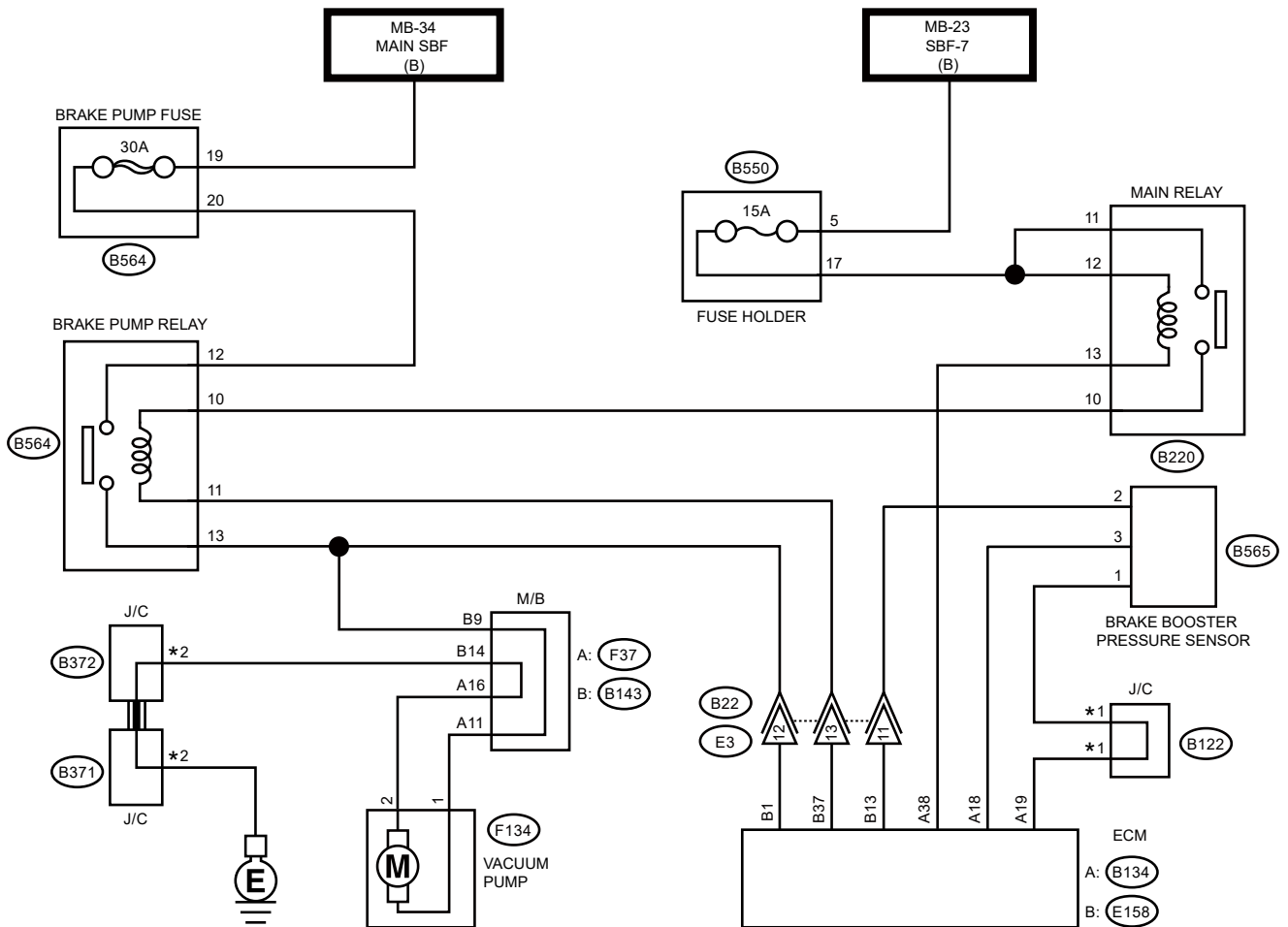
Caution:

Use the check board when measuring the ECM terminal voltage and resistance.

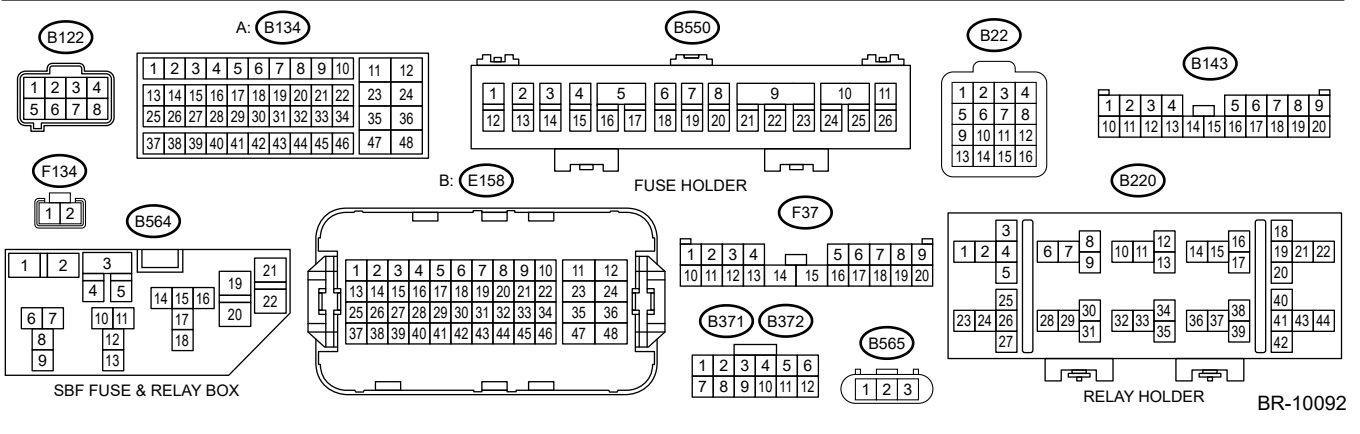
Wiring diagram:

Vacuum pump control system  [Ref. to WIRING SYSTEM>Vacuum Pump Control System>WIRING DIAGRAM.](#)





* 1 : TERMINAL No. OPTIONAL ARRANGEMENT
 * 2 : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 7, 8, 9, 10, 11 AND 12




1. CHECK BRAKE VACUUM HOSE.

1. Turn the ignition switch to OFF.
2. Check the status of the brake vacuum hose connection.

Is the brake vacuum hose connected firmly?



Yes

 [Go to 2.](#)

No

Connect the brake vacuum hose.

2. CHECK BRAKE VACUUM HOSE.

1. Turn the ignition switch to ON and start engine.
2. Check for leakage from the brake vacuum hose.

Is there a leak from the brake vacuum hose?

Yes

Replace the brake vacuum hose.

No

 [Go to 3.](#)

3. CHECK BRAKE BOOSTER PRESSURE SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the brake booster pressure sensor connector.
3. Measure the resistance between brake booster pressure sensor terminals.

Terminals

No. 1 —No. 3:

No. 2 —No. 3:

Is the resistance 15 k Ω or less?

Yes

 [Go to 4.](#)

No

Replace the brake booster.  [Ref. to BRAKE>Brake Booster.](#)

4. CHECK HARNESS BETWEEN ECM AND BRAKE BOOSTER PRESSURE SENSOR CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and brake booster pressure sensor connector terminal.

Connector & terminal


(B134) No. 18 — (B565) No. 3:

(B134) No. 19 — (B565) No. 1:

(E158) No. 13 — (B565) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 5.](#)

No

Repair the open circuit of harness between ECM connector and brake booster pressure sensor connector terminal.

5. CHECK HARNESS BETWEEN ECM AND BRAKE BOOSTER PRESSURE SENSOR CONNECTOR.



Measure the resistance of harness between ECM connector and chassis ground.

Connector & terminal

(B134) No. 18 — Chassis ground:

(B134) No. 19 — Chassis ground:

(E158) No. 13 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 6.](#)

No

Repair the short circuit to ground between the ECM connector and brake booster pressure sensor connector terminal.

6. CHECK HARNESS BETWEEN ECM AND BRAKE BOOSTER PRESSURE SENSOR CONNECTOR.



Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B134) No. 18 (+) — Chassis ground (-):

(B134) No. 19 (+) — Chassis ground (-):

(E158) No. 13 (+) — Chassis ground (-):

Is the voltage 0.5 V or less?

Yes

 [Go to 7.](#)

No

Repair the short circuit to power supply in harness between the ECM connector and brake booster pressure sensor connector terminal.

7. CHECK BRAKE BOOSTER PRESSURE SENSOR POWER SUPPLY.

1. Connect the brake booster pressure sensor connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector terminals.

Connector & terminal


(B134) No. 18 (+) — (B134) No. 19 (-):

Is the voltage 4.75 — 5.25 V?


Yes

 [Go to 8.](#)

No

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

8. CHECK DATA MONITOR.


1. Connect the ECM connector.
2. Turn the ignition switch to ON.
3. Depress the brake pedal several times, until the pedal becomes firm.
4. Read the data monitor of brake vacuum pump system using Subaru Select Monitor.  [Ref. to BRAKE VACUUM PUMP \(DIAGNOSTICS\) >Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Is [Barometric Pressure] and [Brake Booster Pressure] -1 — +1 kPa?

Yes

Temporary poor contact occurs.

No

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

BRAKE VACUUM PUMP (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC 13 PRESSURE SENSOR SIGNAL FREEZE

DTC detecting condition:

Stuck malfunction of brake booster pressure sensor

Trouble symptom:

Brake vacuum pump does not operate.

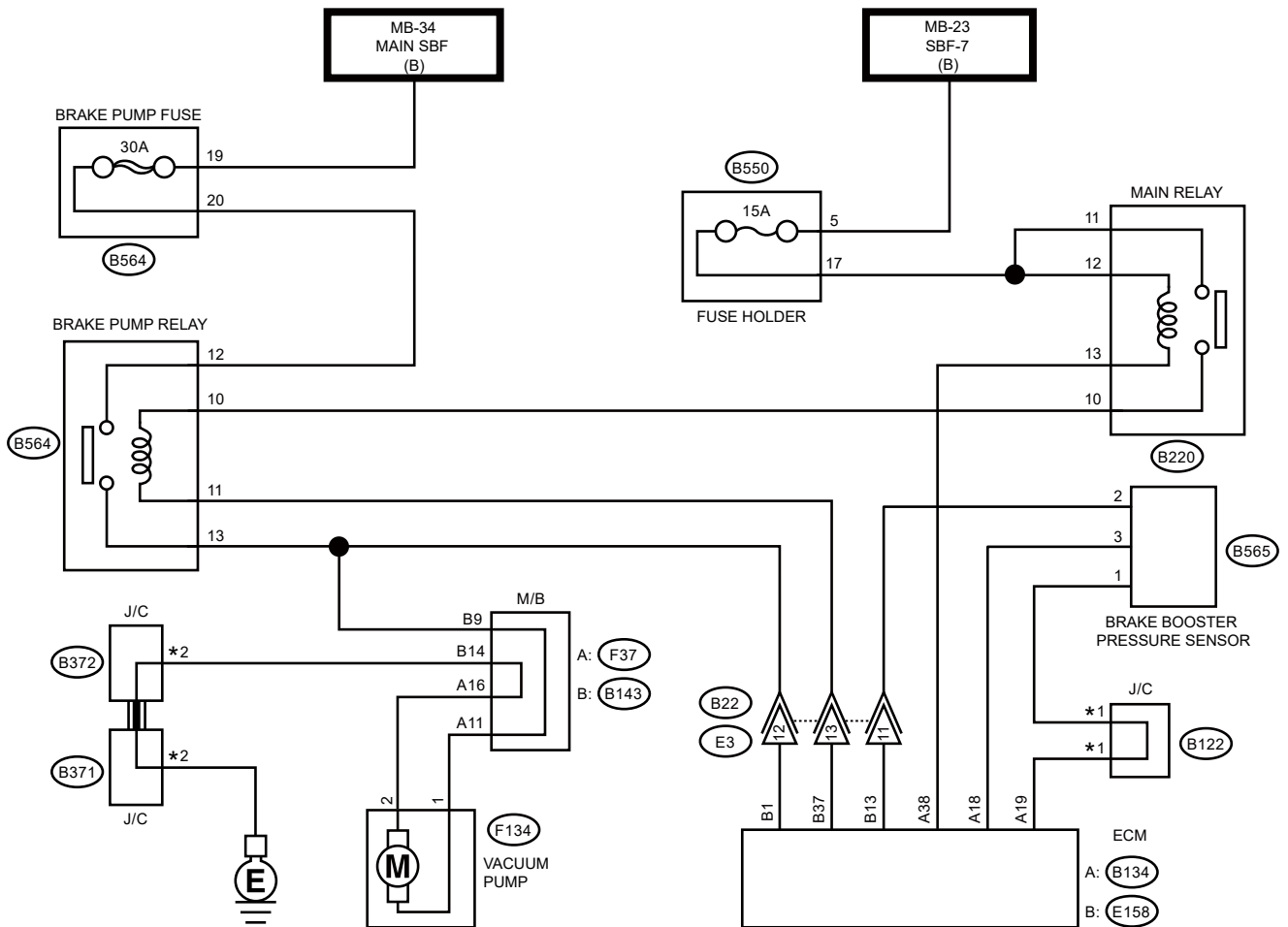
Caution:

Use the check board when measuring the ECM terminal voltage and resistance.

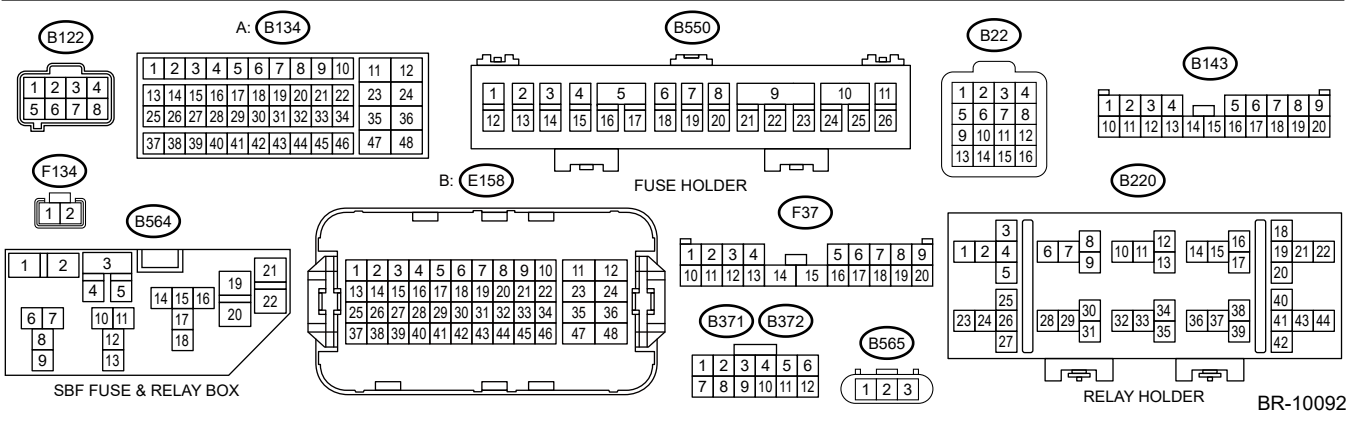
Wiring diagram:

Vacuum pump control system  [Ref. to WIRING SYSTEM>Vacuum Pump Control System>WIRING DIAGRAM.](#)





* 1 : TERMINAL No. OPTIONAL ARRANGEMENT
 * 2 : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 7, 8, 9, 10, 11 AND 12




1. CHECK BRAKE VACUUM HOSE.

1. Turn the ignition switch to OFF.
2. Check the status of the brake vacuum hose connection.

Is the brake vacuum hose connected firmly?



Yes

 [Go to 2.](#)

No

Connect the brake vacuum hose.

2. CHECK BRAKE VACUUM HOSE.

1. Turn the ignition switch to ON and start engine.
2. Check for leakage from the brake vacuum hose.

Is there a leak from the brake vacuum hose?

Yes

Replace the brake vacuum hose.

No

 [Go to 3.](#)

3. CHECK BRAKE BOOSTER PRESSURE SENSOR CONNECTOR.

Check the connection of the brake booster pressure sensor connector.

Is the brake booster pressure sensor connector connected firmly?

Yes

 [Go to 4.](#)

No

Connect the brake booster pressure sensor connector.

4. CHECK BRAKE BOOSTER PRESSURE SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the brake booster pressure sensor connector.
3. Measure the resistance between brake booster pressure sensor terminals.

Terminals

No. 1 —No. 3:

No. 2 —No. 3:

Is the resistance 15 k Ω or less?

Yes

 [Go to 5.](#)

No

Replace the brake booster.  [Ref. to BRAKE>Brake Booster.](#)

5. CHECK HARNESS BETWEEN ECM AND BRAKE BOOSTER PRESSURE SENSOR CONNECTOR.



1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and brake booster pressure sensor connector terminal.

Connector & terminal

(B134) No. 18 — (B565) No. 3:

(B134) No. 19 — (B565) No. 1:

(E158) No. 13 — (B565) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 6.](#)

No

Repair the open circuit of harness between ECM connector and brake booster pressure sensor connector terminal.

6. CHECK HARNESS BETWEEN ECM AND BRAKE BOOSTER PRESSURE SENSOR CONNECTOR.



Measure the resistance of harness between ECM connector and chassis ground.

Connector & terminal

(B134) No. 18 — Chassis ground:

(B134) No. 19 — Chassis ground:

(E158) No. 13 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 7.](#)

No

Repair the short circuit to ground in harness between ECM connector and brake booster pressure sensor connector terminal.

7. CHECK HARNESS BETWEEN ECM AND BRAKE BOOSTER PRESSURE SENSOR CONNECTOR.



Measure the voltage between ECM connector and chassis ground.

Connector & terminal


(B134) No. 18 (+) — Chassis ground (-):

(B134) No. 19 (+) — Chassis ground (—):

(E158) No. 13 (+) — Chassis ground (—):

Is the voltage 0.5 V or less?

Yes

 [Go to 8.](#)

No

Repair the short circuit to power supply in harness between the ECM connector and brake booster pressure sensor connector terminal.

8. CHECK BRAKE BOOSTER PRESSURE SENSOR POWER SUPPLY.

1. Connect the connectors of ECM and brake booster pressure sensor.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector terminals.

Connector & terminal


(B134) No. 18 (+) — (B134) No. 19 (—):

Is the voltage 4.75 — 5.25 V?


Yes

 [Go to 9.](#)

No

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

9. CHECK DATA MONITOR.


1. Connect the ECM connector.
2. Turn the ignition switch to ON.
3. Depress the brake pedal several times, until the pedal becomes firm.
4. Read the data monitor of brake vacuum pump system using Subaru Select Monitor.  [Ref. to BRAKE VACUUM PUMP \(DIAGNOSTICS\) >Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Is [Barometric Pressure] and [Brake Booster Pressure] –1 — +1 kPa?

Yes

Temporary poor contact occurs.

No

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

BRAKE VACUUM PUMP (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC 21 DISCREPANCY IN RELAYS (ON)

DTC detecting condition:

Drive does not match between brake vacuum pump relay and brake vacuum pump.

Trouble symptom:

Brake vacuum pump does not operate.

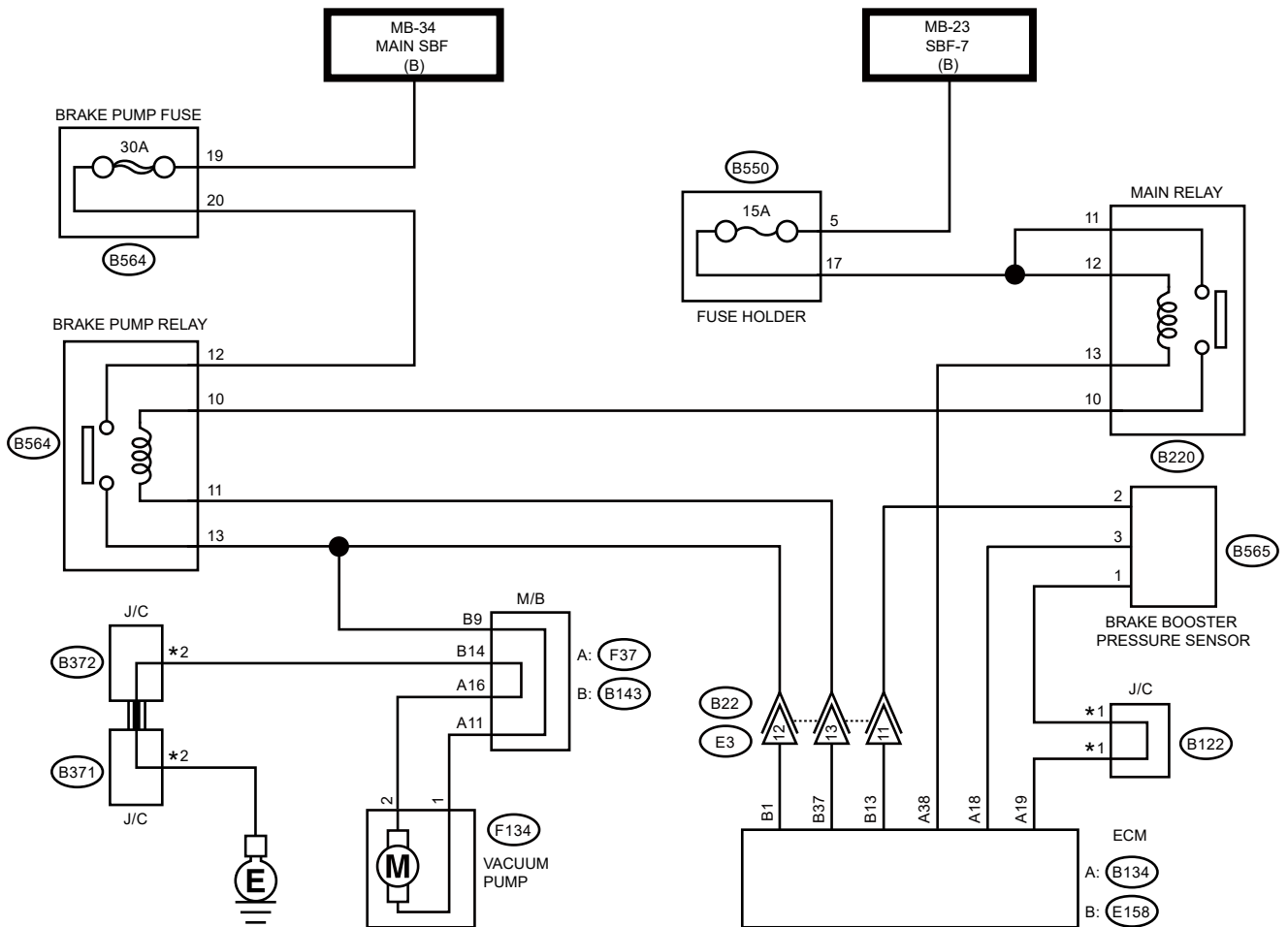
Caution:

Use the check board when measuring the ECM terminal voltage and resistance.

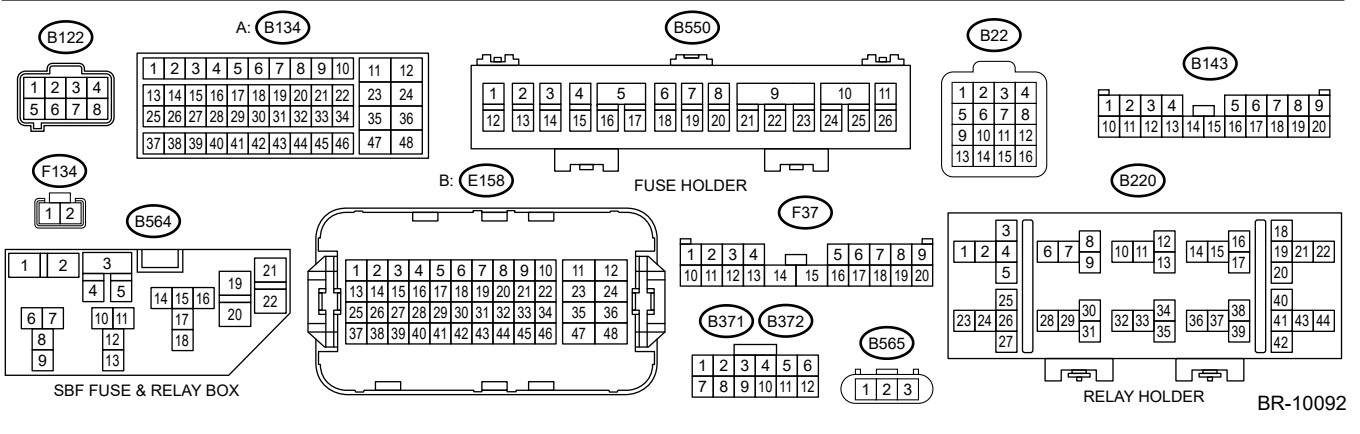
Wiring diagram:

Vacuum pump control system  [Ref. to WIRING SYSTEM>Vacuum Pump Control System>WIRING DIAGRAM.](#)





* 1 : TERMINAL No. OPTIONAL ARRANGEMENT
 * 2 : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 7, 8, 9, 10, 11 AND 12



1. CHECK CONNECTOR.

Check the connection of the brake booster pressure sensor and brake vacuum pump.

Are the brake booster pressure sensor and brake vacuum pump connected firmly?



 [Go to 2.](#)



Yes

No

Connect the connector.

2. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Remove the brake vacuum pump fuse.
3. Check the condition of fuse.

Is the fuse blown out?

Yes

Replace the fuse.

No

 [Go to 3.](#)

3. CHECK BRAKE VACUUM PUMP RELAY.

1. Turn the ignition switch to OFF.
2. Remove the brake vacuum pump relay from relay box.
3. Connect the battery to the brake vacuum pump relay terminals No. 10 and No. 11.
4. Measure the resistance between brake vacuum pump relay terminals.

Terminals

No. 12 —No. 13:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Replace the brake vacuum pump relay.

4. CHECK BRAKE VACUUM PUMP RELAY POWER SUPPLY.

1. Turn the ignition switch to ON.
2. Measure the voltage between brake vacuum pump relay connector and chassis ground.


Connector & terminal

(B564) No. 10 (+) — Chassis ground (-):

(B564) No. 12 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 5.](#)

No

Repair the open or short to ground in the power supply circuit.

5. CHECK HARNESS BETWEEN ECM AND BRAKE VACUUM PUMP RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the ECM connector.
3. Measure the resistance of harness between ECM connector and brake vacuum pump relay connector terminal.

Connector & terminal

(E158) No. 37 — (B564) No. 11:

Is the resistance less than 1 Ω ?

Yes

 [Go to 6.](#)

No

Repair the open circuit of harness between ECM connector and the brake vacuum pump relay connector terminal.

6. CHECK HARNESS BETWEEN THE BRAKE VACUUM PUMP AND BRAKE VACUUM PUMP RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the brake vacuum pump connector.
3. Measure the resistance of harness between brake vacuum pump connector and brake vacuum pump relay connector terminal.

Connector & terminal

(B564) No. 13 — (F134) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 7.](#)

No

Repair the open circuit of harness between brake vacuum pump connector and brake vacuum pump relay connector terminal.

7. CHECK HARNESS BETWEEN ECM AND BRAKE VACUUM PUMP CONNECTOR.


Measure the resistance of harness between brake vacuum pump connector and chassis ground.

Connector & terminal

(F134) No. 1 – Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 8.](#)

No

Repair the ground short circuit of harness between ECM connector and brake vacuum pump connector terminal.

8. CHECK HARNESS BETWEEN ECM AND BRAKE VACUUM PUMP CONNECTOR.


Measure the voltage between brake vacuum pump connector and chassis ground.

Connector & terminal

(F134) No. 1 (+) – Chassis ground (-):

Is the voltage 0.5 V or less?


Yes

 [Go to 9.](#)

No

Repair the short circuit to power supply in harness between the ECM connector and brake vacuum pump connector terminal.

9. CHECK BRAKE VACUUM PUMP.

1. Turn the ignition switch to OFF.
2. Remove the brake vacuum pump.  [Ref. to BRAKE>Brake Vacuum Pump>REMOVAL.](#)
3. Connect the battery positive terminal to the brake vacuum pump terminal No. 1, and the negative terminal to terminal No. 2.

Does the brake vacuum pump operate?


Yes

 [Go to 10.](#)

No

Replace the brake vacuum pump.  [Ref. to BRAKE>Brake Vacuum Pump.](#)

10. CHECK ECM.


- 1.** Connect the brake vacuum pump relay.
- 2.** Connect all connectors.
- 3.** Turn the ignition switch to ON.
- 4.** Execute the Function Check Mode of the brake vacuum pump system using the Subaru Select Monitor.  [Ref. to BRAKE VACUUM PUMP \(DIAGNOSTICS\) >Subaru Select Monitor>OPERATION > FUNCTION CHECK MODE.](#)

Does the brake vacuum pump operate?

Yes

Temporary poor contact occurs.

No

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

BRAKE VACUUM PUMP (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC 22 DISCREPANCY IN RELAYS (OFF)

DTC detecting condition:

Drive does not match between brake vacuum pump relay and brake vacuum pump.

Trouble symptom:

Vacuum pump does not operate properly.

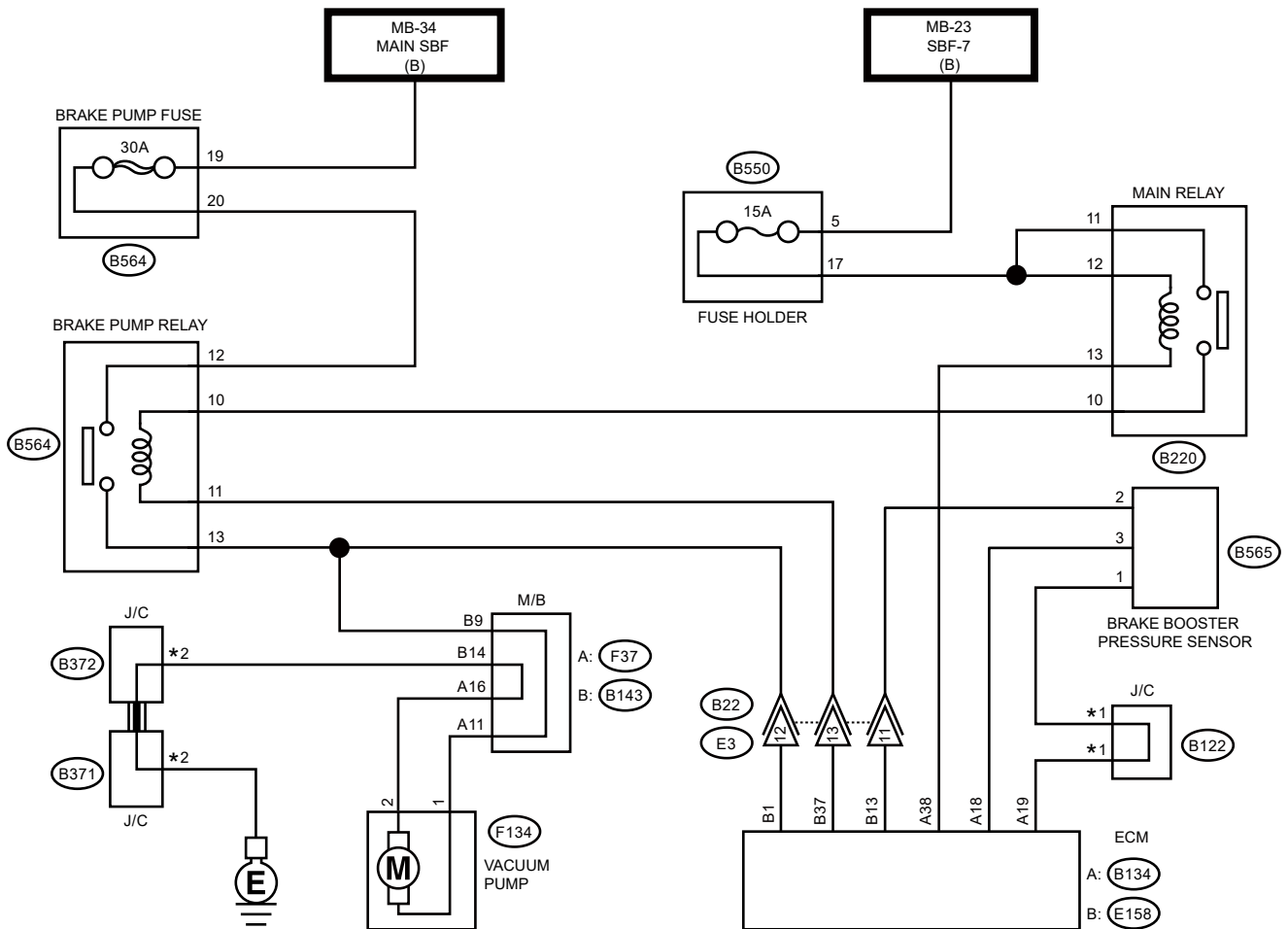
Caution:

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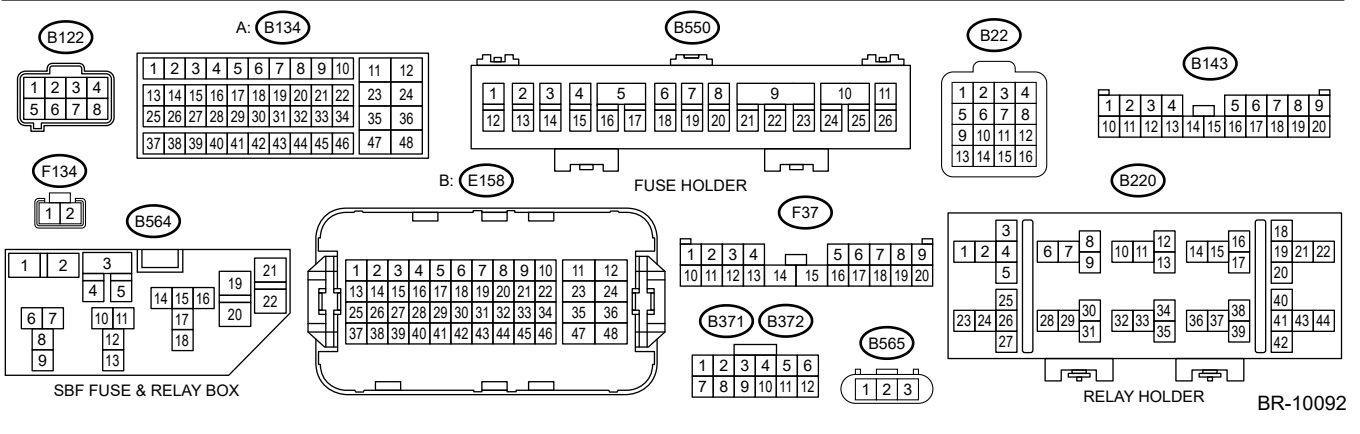
Wiring diagram:

Vacuum pump control system  [Ref. to WIRING SYSTEM>Vacuum Pump Control System>WIRING DIAGRAM.](#)





* 1 : TERMINAL No. OPTIONAL ARRANGEMENT
 * 2 : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 7, 8, 9, 10, 11 AND 12



1. CHECK BRAKE VACUUM PUMP RELAY.


1. Turn the ignition switch to OFF.
2. Remove the brake vacuum pump relay from relay box.
3. Connect the battery to the brake vacuum pump relay terminals No. 10 and No. 11.
4. Measure the resistance between brake vacuum pump relay terminals.

Terminals

No. 12 —No. 13:

Is the resistance less than 1 Ω ?

Yes

 [Go to 2.](#)

No

Replace the brake vacuum pump relay.

2. CHECK BRAKE VACUUM PUMP RELAY POWER SUPPLY.

1. Turn the ignition switch to ON.
2. Measure the voltage between brake vacuum pump relay connector and chassis ground.


Connector & terminal

(B564) No. 10 (+) — Chassis ground (–):

(B564) No. 12 (+) — Chassis ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 3.](#)

No

Repair the open or short to ground in the power supply circuit.

3. CHECK HARNESS BETWEEN ECM AND BRAKE VACUUM PUMP RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the ECM connector.
3. Measure the resistance of harness between ECM connector and brake vacuum pump relay connector terminal.

Connector & terminal

(E158) No. 1 — (B564) No. 13:

(E158) No. 37 — (B564) No. 11:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Repair the open circuit of harness between ECM connector and the brake vacuum pump relay connector terminal.

4. CHECK HARNESS BETWEEN THE BRAKE VACUUM PUMP AND BRAKE VACUUM PUMP RELAY CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the brake vacuum pump connector.
3. Measure the resistance of harness between brake vacuum pump connector and brake vacuum pump relay connector terminal.

Connector & terminal

(B564) No. 13 — (F134) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 5.](#)

No

Repair the open circuit of harness between brake vacuum pump and brake vacuum pump relay connector terminal.

5. CHECK MOTOR GROUND.




1. Measure the resistance between brake vacuum pump connector and chassis ground.

Connector & terminal

(F134) No. 2 — Chassis ground:

Is the resistance less than 1 Ω ?

Yes


 [Go to 6.](#)

No

Repair the ground circuit.

6. CHECK BRAKE VACUUM PUMP.



1. Turn the ignition switch to OFF.
2. Remove the brake vacuum pump.  [Ref. to BRAKE>Brake Vacuum Pump>REMOVAL.](#)
3. Connect the battery to the brake vacuum pump terminals No. 1 (+) and No. 2 (-).

Does the brake vacuum pump operate?

Yes


 [Go to 7.](#)

No

Replace the brake vacuum pump.  [Ref. to BRAKE>Brake Vacuum Pump.](#)

7. CHECK ECM.




1. Connect the brake vacuum pump relay.
2. Connect all connectors.
3. Turn the ignition switch to ON.
4. Execute the Function Check Mode of the brake vacuum pump system using the Subaru Select Monitor.  [Ref. to BRAKE VACUUM PUMP \(DIAGNOSTICS\) >Subaru Select Monitor>OPERATION > FUNCTION CHECK MODE.](#)

Does the brake vacuum pump operate?

Yes

Temporary poor contact occurs.

No

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

BRAKE VACUUM PUMP (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC 23 PUMP CONTINUOUS WORK

DTC detecting condition:

Malfunction in brake vacuum pump continuous drive error

Trouble symptom:

Brake vacuum pump operates continuously.

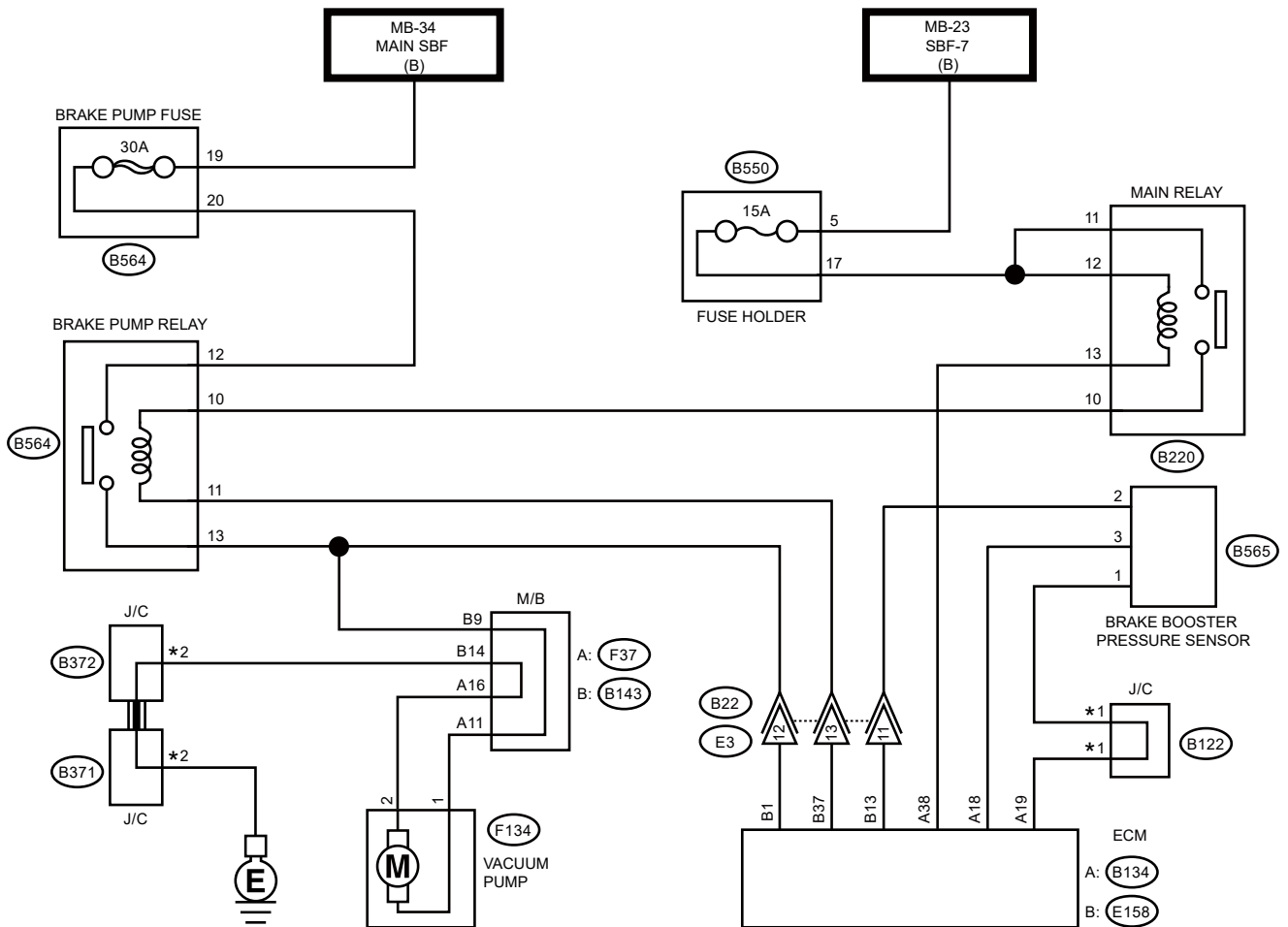
Caution:

Use the check board when measuring the ECM terminal voltage and resistance.

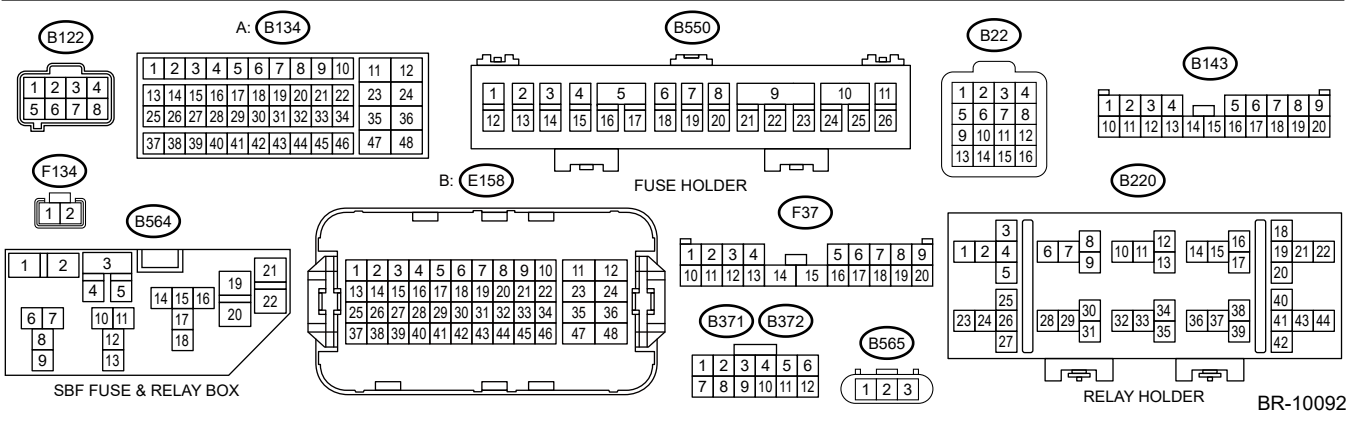
Wiring diagram:

Vacuum pump control system  [Ref. to WIRING SYSTEM>Vacuum Pump Control System>WIRING DIAGRAM.](#)





* 1 : TERMINAL No. OPTIONAL ARRANGEMENT
 * 2 : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 7, 8, 9, 10, 11 AND 12




1. CHECK BRAKE VACUUM HOSE.

1. Turn the ignition switch to OFF.
2. Check the status of the brake vacuum hose connection.

Is the brake vacuum hose connected firmly?



Yes

 [Go to 2.](#)

No

Connect the brake vacuum hose.

2. CHECK BRAKE VACUUM HOSE.

1. Turn the ignition switch to ON and start engine.
2. Check for leakage from the brake vacuum hose.

Is there a leak from the brake vacuum hose?

Yes

Replace the brake vacuum hose.

No

 [Go to 3.](#)

3. CHECK BRAKE VACUUM PUMP RELAY.


1. Turn the ignition switch to OFF.
2. Remove the brake vacuum pump relay from relay box.
3. Connect the battery to the brake vacuum pump relay terminals No. 10 and No. 11.
4. Measure the resistance between brake vacuum pump relay terminals.

Terminals

No. 12 —No. 13:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Replace the brake vacuum pump relay.

4. CHECK BRAKE VACUUM PUMP RELAY POWER SUPPLY.

1. Turn the ignition switch to ON.
2. Measure the voltage between brake vacuum pump relay connector and chassis ground.


Connector & terminal

(B564) No. 10 (+) — Chassis ground (-):

(B564) No. 12 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 5.](#)

No

Repair the open or short to ground in the power supply circuit.

5. CHECK HARNESS BETWEEN ECM AND BRAKE VACUUM PUMP RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the ECM connector.
3. Measure the resistance of harness between ECM connector and brake vacuum pump relay connector terminal.


Connector & terminal

(E158) No. 1 — (B564) No. 13:

(E158) No. 37 — (B564) No. 11:

Is the resistance less than 1 Ω ?

Yes

 [Go to 6.](#)

No

Repair the open circuit of harness between ECM connector and the brake vacuum pump relay connector terminal.

6. CHECK HARNESS BETWEEN THE BRAKE VACUUM PUMP AND BRAKE VACUUM PUMP RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the brake vacuum pump connector.
3. Measure the resistance of harness between brake vacuum pump connector and brake vacuum pump relay connector terminal.

Connector & terminal

(B564) No. 13 — (F134) No. 1:

Is the resistance less than 1 Ω ?


Yes

 [Go to 7.](#)

No

Repair the open circuit of harness between brake vacuum pump connector and brake vacuum pump relay connector terminal.

7. CHECK ECM.


- 1.** Connect the brake vacuum pump relay.
- 2.** Connect all connectors.
- 3.** Turn the ignition switch to ON.
- 4.** Execute the Function Check Mode of the brake vacuum pump system using the Subaru Select Monitor.  [Ref. to BRAKE VACUUM PUMP \(DIAGNOSTICS\) >Subaru Select Monitor>OPERATION > FUNCTION CHECK MODE.](#)

Does the brake vacuum pump operate?

Yes

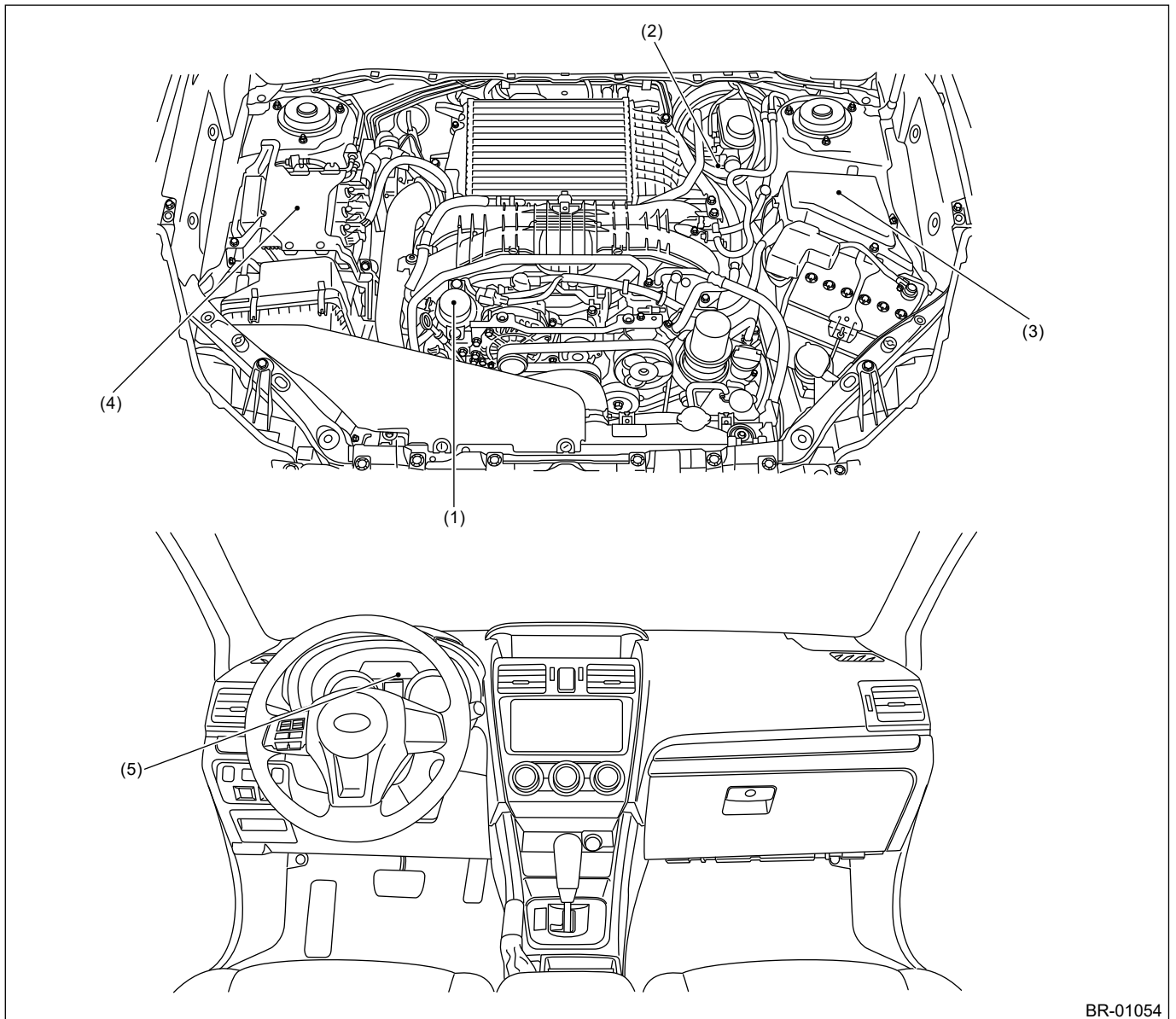
Temporary poor contact occurs.

No

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

BRAKE VACUUM PUMP (DIAGNOSTICS) > Electrical Component Location

LOCATION



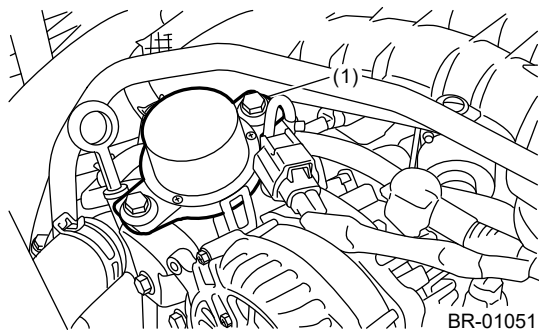
(1) Brake vacuum pump

(3) Brake vacuum pump relay

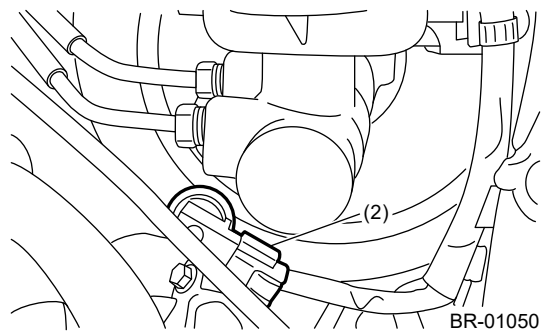
(5) Brake vacuum pump warning light

(2) Brake booster pressure sensor

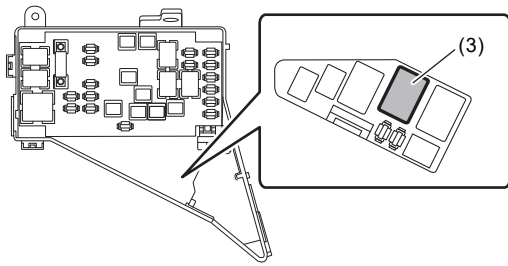
(4) Engine control module (ECM)



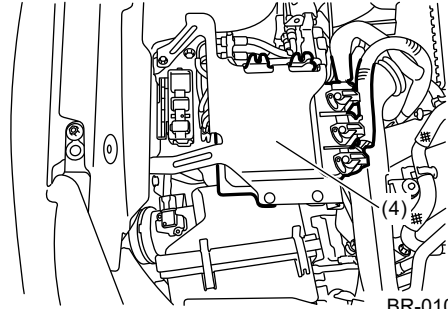
BR-01051



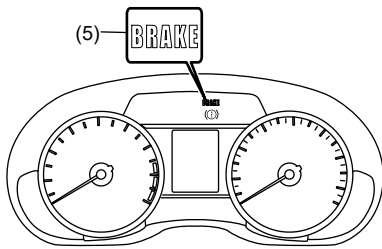
BR-01050



BR-10086

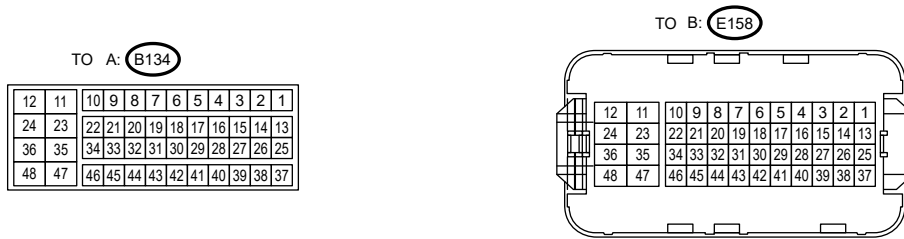


BR-01072



BR-01090

BRAKE VACUUM PUMP (DIAGNOSTICS) > Engine Control Module (ECM) I/O Signal
ELECTRICAL SPECIFICATION



BR-01073

DESCRIPTION	Connect or No.	Terminal No.	Signal (V)		Note	
			Ignition SW ON (Engine OFF)	Engine ON (Idling)		
Brake booster pressure sensor	Signal	E158	13	1 — 3.8	1 — 3.8	—
	Power supply	B134	18	5	5	—
	Ground	B134	19	0	0	—
Self-shutoff control	B134	38	0	0	0	—
Brake vacuum pump	Relay drive	E158	37	10 — 13 (When pump is OFF)	12 — 14 (When pump is ON)	—
				0 (When pump is ON)	0 (When pump is ON)	
	Electric load	E158	1	0 (When pump is OFF)	0 (When pump is OFF)	—
				10 — 13 (When pump is ON)	12 — 14 (When pump is ON)	

BRAKE VACUUM PUMP (DIAGNOSTICS) > General Description

CAUTION


1. SRS AIRBAG SYSTEM

The airbag system wiring harness is routed near the main relay and ECM.

Caution:

- **Do not use electrical test equipment on wiring harness and connector circuits of the airbag system.**
- **Be careful not to damage the airbag system wiring harness.**

2. ENGINE CONTROL MODULE (ECM)

Refer to "CAUTION" in "General Description" in ENGINE (DIAGNOSTICS).  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>General Description>CAUTION.](#)

BRAKE VACUUM PUMP (DIAGNOSTICS) > General Description

INSPECTION

Before performing diagnosis, check the following items which might affect the brake vacuum control.

1. BATTERY

Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DOTC\)>General Description.](#)


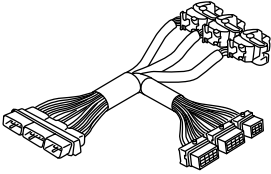
2. BRAKE VACUUM HOSE

Make sure the brake vacuum hose is not cracked or loose.

BRAKE VACUUM PUMP (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>STSSM4</p>	<p>— (Newly adopted tool)</p>	<p>SUBARU SELECT MONITOR 4</p>	<p>Used for setting of each function and troubleshooting for electrical system.</p> <p>Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".</p>
 <p>ST18460AA030</p>	<p>18460AA030</p>	<p>CHECK BOARD</p>	<p>Used for measuring voltage and resistance of ECM terminals.</p>

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Oscilloscope	Used for measuring the sensor.
DST-i	Used together with Subaru Select Monitor 4.

BRAKE VACUUM PUMP (DIAGNOSTICS) > General Diagnostic Table

INSPECTION

Symptoms		Main probable cause	Other probable cause
Poor brake performance	Long braking/stopping distance	<ul style="list-style-type: none"> • Brake pad • Aeration to brake line • Tire specifications, tire wear and air pressures • Incorrect wiring or piping connections 	<ul style="list-style-type: none"> • Master cylinder • Brake caliper • Disc rotor • Brake pipe • Brake booster
	Long brake pedal stroke	<ul style="list-style-type: none"> • Aeration to brake line • Brake pedal play 	<ul style="list-style-type: none"> • Master cylinder • Brake caliper • Brake pad • Brake pipe • Brake booster
	Short brake pedal stroke	<ul style="list-style-type: none"> • Brake vacuum pump • Brake vacuum sensor • Brake vacuum hose 	<ul style="list-style-type: none"> • Master cylinder • Brake caliper • Brake pad • Brake pipe • Brake booster







BRAKE VACUUM PUMP (DIAGNOSTICS) > Inspection Mode

PROCEDURE

Reproduce the malfunction occurrence condition as much as possible.
Drive the vehicle at least ten minutes.

BRAKE VACUUM PUMP (DIAGNOSTICS) > List of Diagnostic Trouble Code (DTC)

LIST


DTC	Item	Content of diagnosis	Reference
11	SENSOR OUTPUT OUT OF RANGE	Malfunction of brake booster pressure sensor output	 Ref. to BRAKE VACUUM PUMP (DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC 11 SENSOR OUTPUT OUT OF RANGE.
12	COMPARE ERROR IN OTHER SENSOR	Error in comparison with other brake booster relative pressure	 Ref. to BRAKE VACUUM PUMP (DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC 12 COMPARE ERROR IN OTHER SENSOR.
13	PRESSURE SENSOR SIGNAL FREEZE	Stuck malfunction of brake booster pressure sensor	 Ref. to BRAKE VACUUM PUMP (DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC 13 PRESSURE SENSOR SIGNAL FREEZE.
21	DISCREPANCY IN RELAYS (ON)	Drive does not match between brake vacuum pump relay and brake vacuum pump.	 Ref. to BRAKE VACUUM PUMP (DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC 21 DISCREPANCY IN RELAYS (ON).
22	DISCREPANCY IN RELAYS (OFF)	Drive does not match between brake vacuum pump relay and brake vacuum pump.	 Ref. to BRAKE VACUUM PUMP (DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC 22 DISCREPANCY IN RELAYS (OFF).
23	PUMP CONTINUOUS WORK	Malfunction in brake vacuum pump continuous drive error	 Ref. to BRAKE VACUUM PUMP (DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC 23 PUMP CONTINUOUS WORK.

BRAKE VACUUM PUMP (DIAGNOSTICS) > Read Diagnostic Trouble Code (DTC)

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Brake Vacuum Pump].
5. On [Select Function] display, select [DTC].

Note:

- For details concerning the DTC, refer to “List of Diagnostic Trouble Code (DTC)”.
 [Ref. to BRAKE VACUUM PUMP \(DIAGNOSTICS\) >List of Diagnostic Trouble Code \(DTC\).](#)
- For detailed operation procedures, refer to “Application help”.

OPERATION

1. HOW TO USE SUBARU SELECT MONITOR

For detailed operation procedures, refer to "Application help".

2. DATA MONITOR

- 1. On [Start] display, select [Diagnosis].
- 2. On [Vehicle selection] display, enter vehicle information and select [OK].
- 3. On [Main Menu] display, select [Each System].
- 4. On [Select System] display, select [Brake Vacuum Pump].
- 5. On [Select Function] display, select [Data monitor].

Display	Contents to be displayed	Unit of measure
Barometric Pressure	Barometric pressure is displayed.	kPa
Brake Booster Pressure	Brake booster pressure is displayed.	kPa

Note:

For detailed operation procedures, refer to "Application help".

3. FUNCTION CHECK MODE

- 1. Turn the ignition switch to ON (engine OFF) and run the Subaru Select Monitor.
- 2. On [Start] display, select [Diagnosis].
- 3. On [Vehicle selection] display, enter vehicle information and select [OK].
- 4. On [Main Menu] display, select [Each System].
- 5. On [Select System] display, select [Brake Vacuum Pump].
- 6. On [Select Function] display, select [Work Support].
- 7. On [Work Support] display, select [Function Check Sequence].
- 8. When [Sequence Control Mode will be started] is displayed, select the [OK] button.

Note:

For detailed operation procedures, refer to "Application help".

COMBINATION METER (DIAGNOSTICS) > Active Test

LIST

Normal meter

Check item	Item 1	Item 2	Note
Pointer operation check	Speedometer	Speedometer 0 km/h (MPH) indication	—
		Speedometer 40 km/h (MPH) indication	—
		Speedometer 80 km/h (MPH) indication	—
		Speedometer 120 km/h (MPH) indication	—
		Speedometer 160 km/h (MPH) indication	—
		Speedometer 200 km/h (MPH) indication	—
		Speedometer 240 km/h (MPH) indication	—
	Tacho meter	Tachometer 0 rpm indication	—
		Tachometer 1000 rpm indication	—
		Tachometer 2000 rpm indication	—
		Tachometer 3000 rpm indication	—
		Tachometer 4000 rpm indication	—
		Tachometer 5000 rpm indication	—
		Tachometer 6000 rpm indication	—
Segment of liquid crystal display check	LCD display all lighted		—
	AT shift (CVT only)	P range display	—
		R range display	—
		N range display	—
		L range display	—
		"Up" display	—
		"Down" display	—

	8 range display	—
	7 range display	—
	6 range display	—
	5 range display	—
	4 range display	—
	3 range display	—
	2 range display	—
	1 range display	—
Odometer	Odometer numerical device display 0	—
	Odometer numerical device display 1	—
	Odometer numerical device display 2	—
	Odometer numerical device display 3	—
	Odometer numerical device display 4	—
	Odometer numerical device display 5	—
	Odometer numerical device display 6	—
	Odometer numerical device display 7	—
	Odometer numerical device display 8	—
	Odometer numerical device display 9	—
Trip meter	Trip meter numerical device display 0	—
	Trip meter numerical device display 1	—
	Trip meter numerical device display 2	—
	Trip meter numerical device display 3	—
	Trip meter numerical device display 4	—
	Trip meter numerical device display 5	—
	Trip meter numerical device display 6	—

		Trip meter numerical device display 7	—
		Trip meter numerical device display 8	—
		Trip meter numerical device display 9	—
	Fuel gauge bar display	Fuel sender E-point command	—
		Meter E scale command	—
		Low fuel warning indicate point (fuel warning also lights)	—
		Meter 1/4 scale command	—
		Meter 1/2 scale command	—
		Meter 3/4 scale command	—
		Meter F-scale command	—
		Fuel sender F-point command	—
	Shift-up indicator (MT only)		—
	CRUISE(CC) indicator		—
	SET indicator		—
Light check	All lamps lighted		—
	Indicator drive	High-beam indicator	—
		Position light indicator (High grade meter)	—
		Front fog light indicator	—
		Water temperature (COOL) indicator	—
		VDC OFF indicator	—
		VDC operation/failure indicator	—
		Hill start assist OFF/failure indicator	—
		SRH OFF indicator	—
		SRVD OFF indicator	—
	Warning drive	Driver side seat belt warning	—
		Airbag warning	—
All seats door warning		—	

		Water temperature (HOT) warning	—
		E/G remaining oil warning	—
		AT (CVT) oil temperature warning (CVT only)	—
		ABS warning	—
		BRAKE warning	—
		AWD warning (CVT only)	—
		Remaining washer fluid washer	—
		Remaining fuel warning	—
		EPS warning	—
		EYESIGHT failure warning	—
		Check E/G warning	—
		Charge warning	—
		SRVD warning	—
		HID auto leveler warning	—
		TPMS warning	—
MFD output check		Passenger side seat belt warning	—
		Momentary fuel efficiency display value	—
		Mean fuel efficiency A display value	—
		Mean fuel efficiency B display value	—
		Remaining fuel cruising distance display value	—
		Ambient air temperature	—
		Mean vehicle speed display value	—
BUZZER		Sounding output ON/OFF	—
Illumination check		Brightness check	—

Color TFT meter

Check item	Item 1	Item 2	Note
Pointer operation check	Speedometer	Speedometer 0 km/h (MPH) indication	—
		Speedometer 40 km/h (MPH) indication	—
		Speedometer 80 km/h (MPH) indication	—
		Speedometer 120 km/h (MPH) indication	—
		Speedometer 160 km/h	—

		(MPH) indication	
		Speedometer 200 km/h (MPH) indication	—
		Speedometer 240 km/h (MPH) indication	—
	Tacho meter	Tachometer 0 rpm indication	—
		Tachometer 1000 rpm indication	—
		Tachometer 2000 rpm indication	—
		Tachometer 3000 rpm indication	—
		Tachometer 4000 rpm indication	—
		Tachometer 5000 rpm indication	—
		Tachometer 6000 rpm indication	—
		Tachometer 7000 rpm indication	—
Light check	All lamps lighted		—
	Indicator drive	High-beam indicator	—
		Position light indicator	—
		Front fog light indicator	—
		Water temperature (COOL) indicator	—
		VDC OFF indicator	—
		VDC operation/failure indicator	—
		Hill start assist OFF/failure indicator	—
		LANE OFF indicator	—
		P-CR OFF indicator	—
		HBA indicator	—
		SRF OFF indicator	—
	SRH OFF indicator	—	
	Warning drive	Driver side seat belt warning	—
Airbag warning		—	
All seats door warning		—	
Water temperature (HOT)		—	

	warning	
	AT (CVT) oil temperature warning (CVT only)	—
	ABS warning	—
	BRAKE warning	—
	AWD warning (CVT only)	—
	Remaining fuel warning	—
	EPS warning	—
	Check E/G warning	—
	Charge warning	—
	Oil pressure warning	—
	HID auto leveler warning	—
	TPMS warning	—
MFD output check	Passenger side seat belt warning	—
	Momentary fuel efficiency display value	—
	Mean fuel efficiency A display value	—
	Mean fuel efficiency B display value	—
	Remaining fuel cruising distance display value	—
	Ambient air temperature	—
	Mean vehicle speed display value	—
BUZZER	Sounding output ON/OFF	—
Illumination check	Brightness check	—
Display Operation Check Mode	White indication	—
	Black indication	—
	Red indication	—
	Green indication	—
	Blue indication	—
	Gradation indication	—
	Flicker indication	—
	Cross talking indication	—

COMBINATION METER (DIAGNOSTICS) > Active Test

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Combination Meter], and then select [Enter].
5. On [Select Function] display, select [Active Test].
6. On [Active Test] display, select an item to be checked.

Note:

- For detailed operation procedures, refer to "Application help".
- If not equipped (depending on destination area or vehicle equipment condition), process will not go on.

Caution:

After executing the system operation check mode, make sure to clear memory.

 **Ref. to COMBINATION METER (DIAGNOSTICS)>Clear memory.**

PROCEDURE

1. PERFORM CUSTOMER INTERVIEW.



Using the Check List for Interview, ask the customer the condition of how trouble occurs.

[Ref. to COMBINATION METER \(DIAGNOSTICS\)>Check List for Interview.](#)

Did you interview the customer?

Yes

[Go to 2.](#)

No

Interview the customer. [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Check List for Interview.](#)

2. CHECK CAN COMMUNICATION.



Read the DTC of the CAN system using the Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes

Perform the diagnosis for the displayed DTCs. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 3.](#)

3. CHECK COMBINATION METER.



Using the Subaru Select Monitor, read DTC of combination meter. [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?


Yes

Record the DTCs and time stamps, and perform the diagnosis for the displayed DTCs. [Ref. to COMBINATION METER \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)


Note:

For time stamp, refer to "LAN SYSTEM". [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>General Description>CAUTION > TIME STAMP.](#)

No

 [Go to 4.](#)

4. CHECK COMBINATION METER.


Check the operation of combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Active Test.](#)

Is the check result OK?

Yes

System is normal.

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

COMBINATION METER (DIAGNOSTICS) > Check List for Interview

CHECK

- Inspect the following items regarding the vehicle's state.
- Print out this page for interviewing customers.



Combination Meter Check List for Interview			Date the Vehicle is Received	
Year	Month	Day		
Customer's name		Registration No.	Initial year of registration Year Month Date	
		Vehicle model	Frame number	
Interviewer	Inspector	Engine type	Odometer reading	
Customer specified content				
<ul style="list-style-type: none"> • • • 				
Date and time when the trouble occurred		Frequency of trouble occurrence	Always occurs Sometimes occurs (times per day, times per month)	
Condition of trouble occurrence (How the trouble occurs)		Weather	Fine • Cloudy • Rainy • Snowy • Others ()	
		Temperature	°C (°F) — °C (°F)	
Road conditions		Occurrence location		
Accessory installation condition				
Confirmation of trouble condition				
<input type="checkbox"/> Combination meter				
<input type="checkbox"/> Diagnostic Trouble Code				

COMBINATION METER (DIAGNOSTICS) > Clear memory

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Combination Meter], and then select [Enter].
5. On [Select Function] display, select [DTC].
6. On [DTC] display, select [Clear memory].

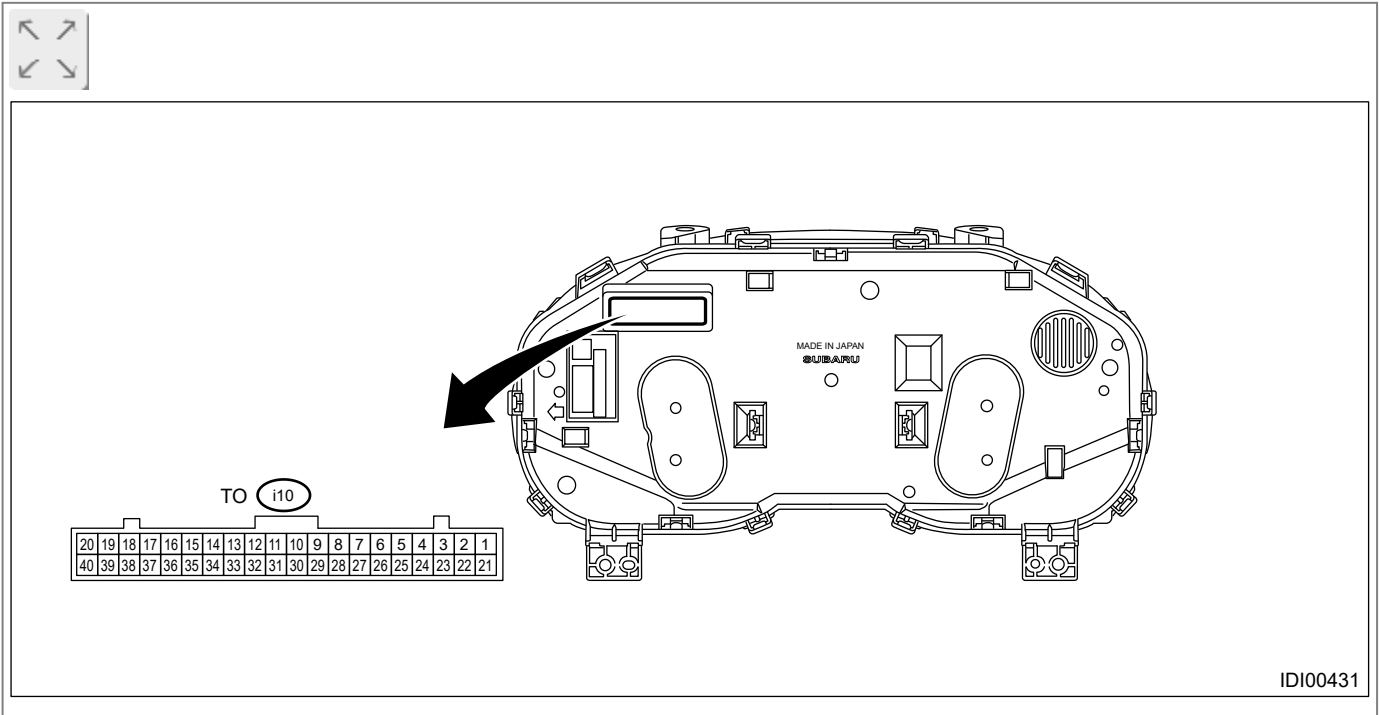
Note:

For detailed operation procedures, refer to "Application help".

COMBINATION METER (DIAGNOSTICS) > Control Module I/O Signal

ELECTRICAL SPECIFICATION

Combination meter



IDI00431

Terminal No.	Content	Measuring condition	Standard
1 ↔ Chassis ground	Security indicator	Security indicator light off → on	0 V → 10 – 14 V
2 ↔ Chassis ground	Charge warning light	Charge warning light off → on	0 V → 10 – 14 V
3 ↔ Chassis ground	Oil pressure warning light	Oil pressure warning light off → on	0 V → 10 – 14 V
4 ↔ Chassis ground	RH turn indicator	RH turn indicator off → on	0 V → 10 – 14 V
5	—	—	—
6 ↔ Chassis ground	LH turn indicator	LH turn indicator off → on	0 V → 10 – 14 V
7	—	—	—
8 ↔ Chassis ground	Auto headlight beam leveler warning light	Auto headlight beam leveler warning light off → on	0 V → 10 – 14 V
9	—	—	—
10	—	—	—
11	—	—	—
12	—	—	—
13	—	—	—
14	—	—	—

15 ↔ Chassis ground	Driver's seat belt switch	Driver's seat belt switch ON	Less than 1 Ω
16	Passenger's seat belt switch	Passenger's seat belt switch ON	Less than 1 Ω
17	—	—	—
18	—	—	—
19	—	—	—
20 ↔ Chassis ground	Ignition power supply	Ignition switch OFF → ON	0 V → 10 — 14 V
21 ↔ Chassis ground	Washer fluid level sensor	—	—
22	—	—	—
23 ↔ Chassis ground	Brake fluid level switch	—	—
24	—	—	—
25 ↔ 37	Fuel level sensor	Always	10 — 600 Ω
26	—	—	—
27 ↔ 36	Ambient sensor	Always	1 — 35 kΩ
28 (UART) ↔ Chassis ground	UART (MFD)	Cannot be measured	—
29	—	—	—
30	—	—	—
31	SI-DRIVE input	—	—
32 (CAN-) ↔ Chassis ground	CAN communication line (-)	Cannot be measured	—
33 (CAN+) ↔ Chassis ground	CAN communication line (+)	Cannot be measured	—
34 ↔ Chassis ground	R. DIFF GND	Always	Less than 1 Ω
35 ↔ Chassis ground	SI-DRIVE input GND	Always	Less than 1 Ω
36 ↔ Chassis ground	Ambient sensor GND	Always	Less than 1 Ω
37 ↔ Chassis ground	Fuel level sensor GND	Always	Less than 1 Ω
38 ↔ Chassis ground	GND	Always	Less than 1 Ω
39 ↔ Chassis ground	Backup ignition power supply	Always	Less than 1 Ω
40 ↔ Chassis ground	Battery power supply	Always	10 — 14 V

COMBINATION METER (DIAGNOSTICS) > Customize

LIST

Items to be displayed	Initial setting value	Customize setting	Note
Air temperature correction	±0°C	-5°C — +5°C	Temperature compensation can only be performed by 1°C (1°C = 1.8°F) interval.
Mean fuel efficiency correction	±0%	-10% — +10%	—

COMBINATION METER (DIAGNOSTICS) > Customize

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Combination Meter], and then select [Enter].
5. On [Select Function] display, select [Customize].
6. On [Customize] display, select an item to be customized.

Note:

- **For detailed operation procedures, refer to “Application help”.**
- **If not equipped (depending on destination area or vehicle equipment condition), some items are not displayed.**

COMBINATION METER (DIAGNOSTICS) > Data Monitor

LIST

Items to be displayed	Unit of measure	Content	Note
IG on trip number	Time	Time stamp information	—
IG on supply system	—	Time stamp information	—
past time after IG on	ms	Time stamp information	—
Fuel level resistance	Ω	Fuel sensor value display	—
Ambient air temperature	°C	External temperature sensor value display	—
Ambient air temperature	°C	Calculated value of external temperature for indication	—
Vehicle speed data	km/h (MPH)	Vehicle speed value detected by meter	—
Engine revolution data	rpm	Engine speed value detected by meter	—
Drivers seat seat-belt wearing state	—	Displays ON/OFF	—
Passenger seat seat-belt wearing state	—	Displays ON/OFF	—
Rear seat right seat-belt wearing state	—	Displays ON/OFF	—
Rear seat center seat-belt wearing state	—	Displays ON/OFF	—
Rear seat left seat-belt wearing state	—	Displays ON/OFF	—

COMBINATION METER (DIAGNOSTICS) > Data Monitor

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Combination Meter], and then select [Enter].
5. On [Select Function] display, select [Data monitor].

Note:

For detailed operation procedures, refer to "Application help".

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1500 FUEL SENDER OPEN DETECTED

DTC detecting condition:

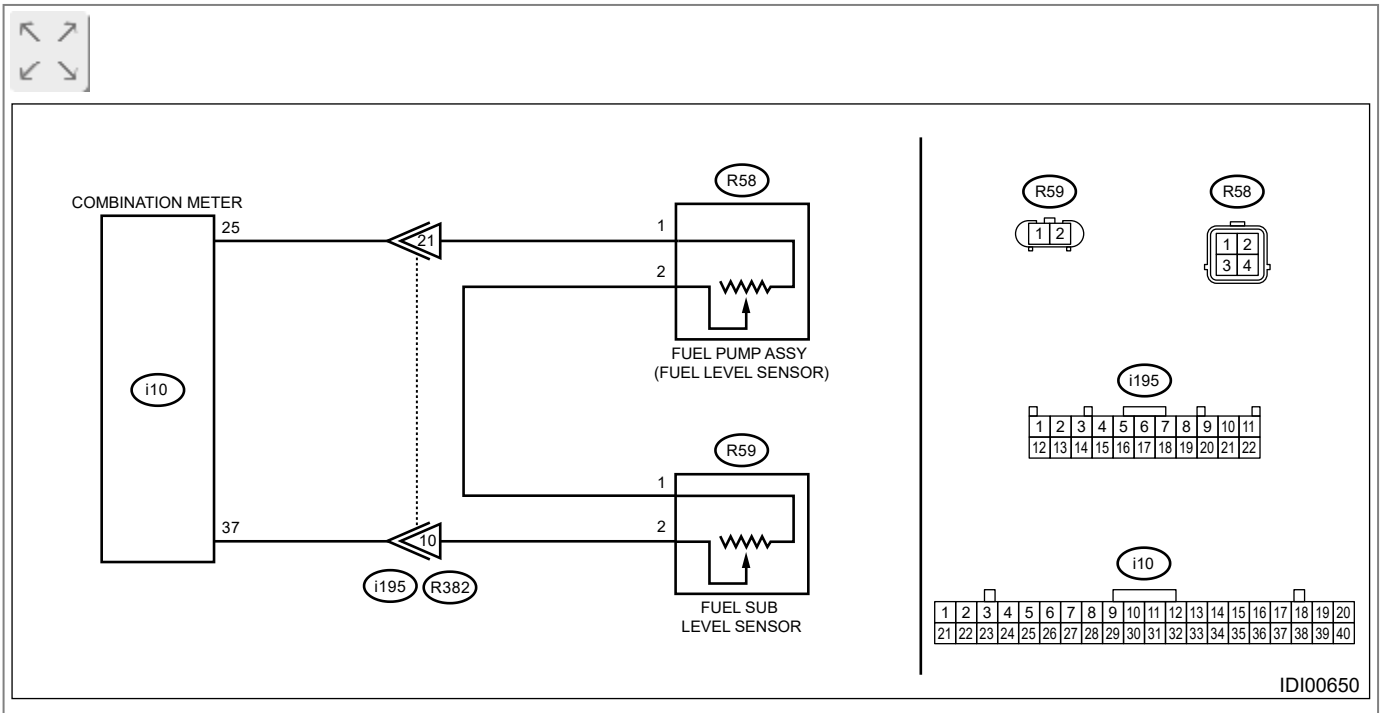
The fuel gauge circuit is open or shorted.

Trouble symptom:


- Defective fuel gauge.
- Fuel level warning light blinks.

Wiring diagram:

Fuel gauge system  [Ref. to WIRING SYSTEM>Fuel Gauge System>WIRING DIAGRAM.](#)




1. CHECK DTC.

Using the Subaru Select Monitor, read DTC of combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1500 displayed? (Current malfunction)


Yes

 [Go to 2.](#)

No


 [Go to 7.](#)

2. CHECK COMBINATION METER.


1. Check the operation of combination meter using Subaru Select Monitor.
2. Select [Fuel Meter Operation] and [Remaining fuel warning] from Active Test.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Active Test.](#)

Is the operation of combination meter OK?

Yes

 [Go to 3.](#)

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the combination meter connector and the fuel sub level sensor connector and the fuel level sensor connector.
3. Using the tester, measure the resistance between terminals.


Connector & terminal

(i10) No. 25 — (R58) No. 1:

(i10) No. 37 — (R59) No. 2:

Is the resistance 10 Ω or less?

Yes

 [Go to 4.](#)

No

Repair the open circuit of harness or replace harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using the tester, measure the resistance between terminals.

Connector & terminal

(i10) No. 25 — Chassis ground:


(i10) No. 37 — Chassis ground:

Is the resistance 10 Ω or less?


Yes

Repair the short circuit of harness or replace harness.

No

 [Go to 5.](#)

5. CHECK FUEL SUB LEVEL SENSOR.

Check the fuel sub level sensor as a single part.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Sub Level Sensor>INSPECTION.](#)

Is the check result OK?


Yes

 [Go to 6.](#)

No


Replace the sensor.

6. CHECK FUEL LEVEL SENSOR.

Check the fuel level sensor as a single part.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Level Sensor>INSPECTION.](#)

Is the check result OK?

Yes

 [Go to 7.](#)

No

Replace the sensor.

7. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect connectors.
3. Check for poor contact of connector.

Is the check result OK?


Yes

 [Go to 8.](#)

No

Repair or replace the poor contact of connector.

8. CHECK CURRENT DATA.


Using the Subaru Select Monitor, display [Fuel level resistance] from the data monitor.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Data Monitor.](#)

Does the data display 10 — 570 Ω ?

Yes

System is normal.

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1501 POWER SUPPLY SYSTEM ERROR DETECTION


DTC detecting condition:

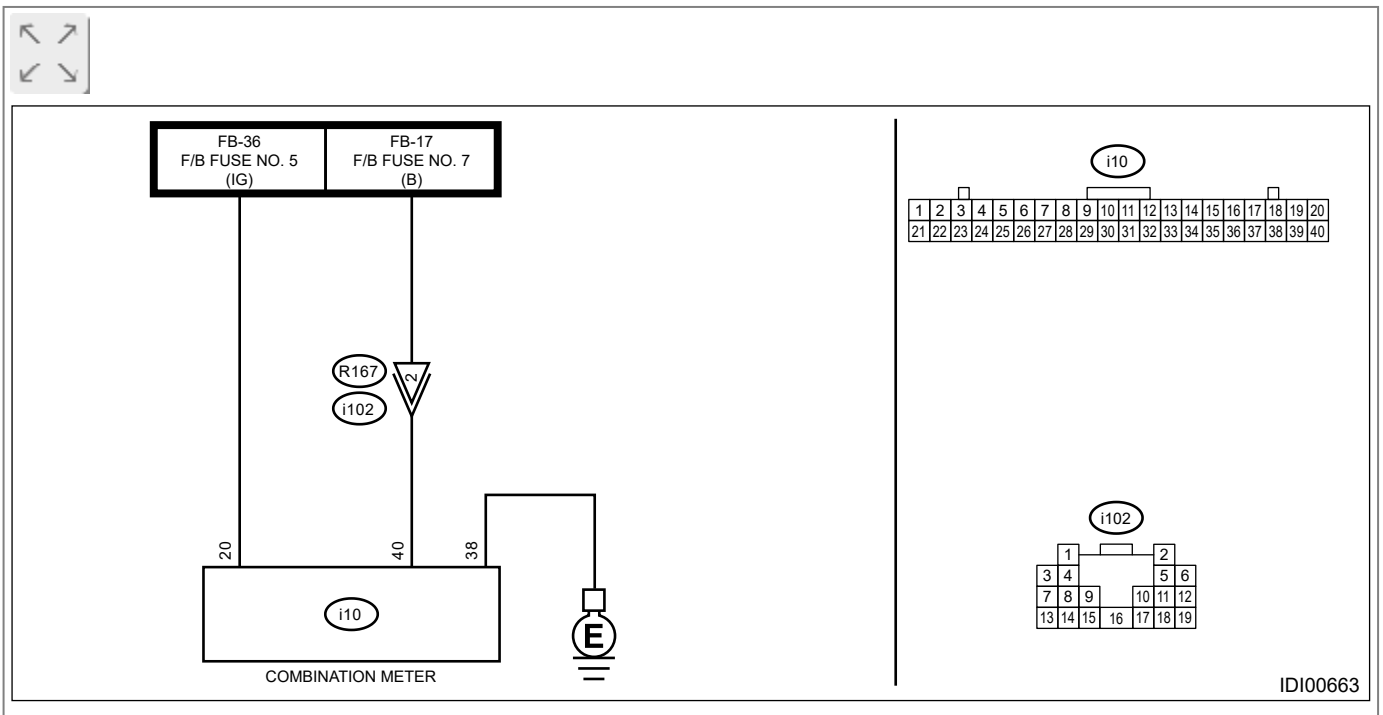
Open or short in combination meter power supply circuit

Trouble symptom:

Defective operation of combination meter

Wiring diagram:

Combination meter system  [Ref. to WIRING SYSTEM>Combination Meter System>WIRING DIAGRAM.](#)




1. CHECK POWER SUPPLY CIRCUIT.

Turn the ignition switch to ON, and confirm that the illumination of combination meter lights.

Does the illumination light?


Yes

 [Go to 2.](#)

No


 [Go to 3.](#)

2. CHECK DTC.


Read the DTC of the combination meter using the Subaru Select Monitor.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1501 displayed? (Current malfunction)


Yes

 [Go to 3.](#)

No


 [Go to 5.](#)

3. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse.  [Ref. to INSTRUMENTATION/DRIVER INFO>Relay and Fuse.](#)

Is the check result OK?

Yes

 [Go to 4.](#)

No

Replace the defective fuse.

4. CHECK HARNESS (POWER SUPPLY CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the meter connector.
3. Using the tester, measure the voltage between terminals.

Connector & terminal

(i10) No. 20 (+) — Chassis ground (—):

(i10) No. 40 (+) — Chassis ground (—):

Is the voltage 8.5 — 16.5 V?

Yes

 [Go to 5.](#)

No

Repair the open circuit of harness or replace harness.

5. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect connectors.

3. Check for poor contact of connector.

Is the check result OK?

Yes

A temporary change of voltage occurred.

No

Repair or replace the poor contact of connector.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1507 OUTSIDE TEMPERATURE SENSOR OPEN DETECTED

DTC detecting condition:

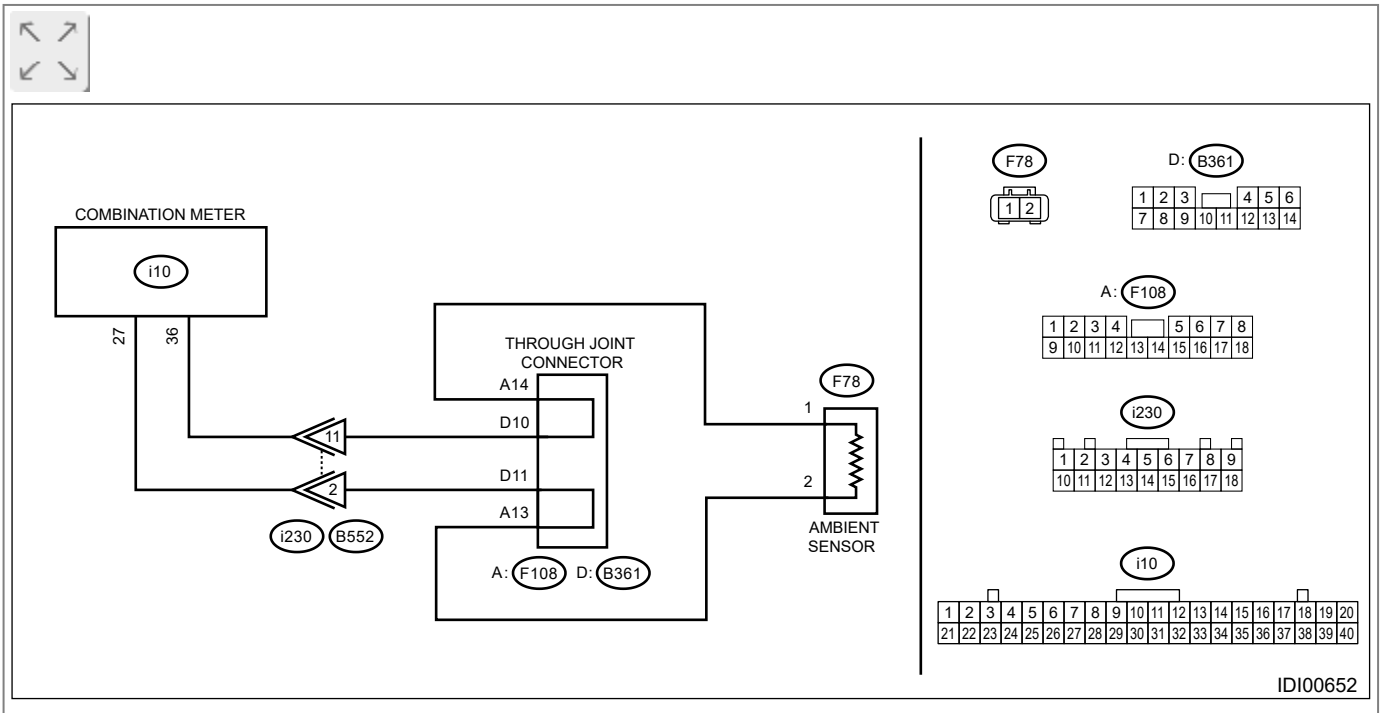
Open or short circuit in ambient sensor

Trouble symptom:

- Defective ambient temperature display
- Defective air conditioner operation

Wiring diagram:


Air conditioning system  [Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.](#)



ID100652


1. CHECK DTC.



Using the Subaru Select Monitor, read DTC of combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1507 displayed? (Current malfunction)

Yes

 [Go to 2.](#)

No

 [Go to 6.](#)

2. CHECK CURRENT DATA.



Using the Subaru Select Monitor, display [Ambient air temperature] from the data monitor.

 [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Data Monitor.](#)

Is data displayed?

Yes

System is normal.

No

 [Go to 3.](#)

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the meter connector and ambient sensor connector.
3. Using the tester, measure the resistance between terminals.

Connector & terminal

(i10) No. 36 — (F78) No. 1:

(i10) No. 27 — (F78) No. 2:

Is the resistance 10 Ω or less?

Yes

 [Go to 4.](#)

No

Repair the open circuit of harness or replace harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using the tester, measure the resistance between terminals.

Connector & terminal

(i10) No. 36 — Chassis ground:

(i10) No. 27 — Chassis ground:

Is the resistance 10 Ω or less?


Yes

Repair the short circuit of harness or replace harness.

No


 [Go to 5.](#)

5. CHECK AMBIENT SENSOR.

Perform the inspection of ambient sensor unit.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Ambient Sensor>INSPECTION.](#)

Is the check result OK?

Yes

 [Go to 6.](#)

No

Replace the sensor.

6. CHECK CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect connectors.
3. Check for poor contact of connector.

Is the check result OK?

Yes

A temporary change of voltage occurred.

No

Repair or replace the poor contact of connector.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

Detected when CAN line abnormality is detected.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

Detected when CAN data from the engine control module (ECM) does not arrive.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM

Detected when CAN data from TCM does not arrive.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

Detected when CAN data from VDC CM does not arrive.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0131 LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE

Detected when CAN data is not received from electric power steering CM.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE

Detected when CAN data is not received from body integrated unit.

Note:


Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0151 LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE

Detected when CAN data is not received from airbag CM.

Note:


Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0156 LOST COMMUNICATION WITH INFORMATION CENTER "A"

Detected when CAN data from MFD does not arrive.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0164 LOST COMMUNICATION WITH HVAC CONTROL MODULE

Detected when CAN data is not received from A/C CM.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0181 LOST COMMUNICATION WITH HEADLAMP LEVELING CONTROL MODULE

Detected when CAN data from AHL CM does not arrive.

Note:


Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0327 SOFTWARE INCOMPATIBILITY WITH VEHICLE SECURITY CONTROL MODULE

Detected when CAN data is not received from keyless access CM.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1233 LOST COMMUNICATION WITH RAB CONTROL MODULE

Detected when CAN data from RAB CM does not arrive.

Note:


Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1235 LOST COMMUNICATION WITH EYESIGHT

Detected when CAN data from the stereo camera does not arrive.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1433 INVALID DATA RECEIVED FROM EYESIGHT

Detected when the microcomputer of the stereo camera froze.

Note:


Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

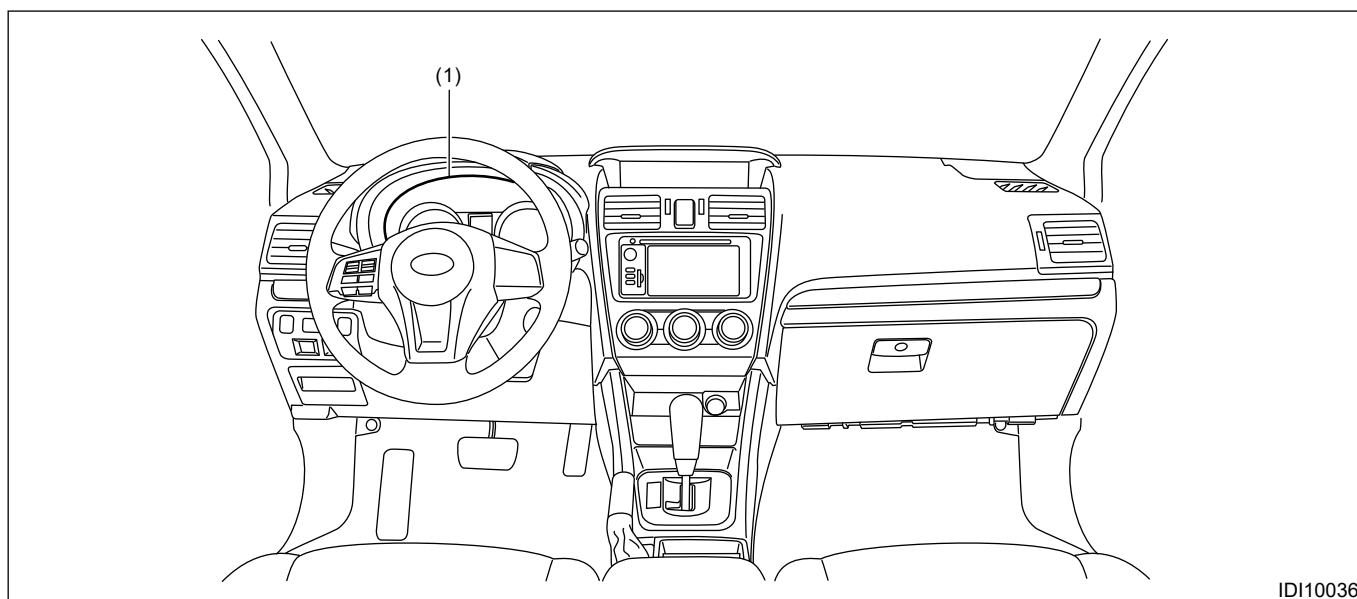
1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Combination Meter], and then select [Enter].
5. On [Select Function] display, select [DTC].

Note:

- For detailed operation procedures, refer to “Application help”.
 - For details concerning DTC, refer to “List of Diagnostic Trouble Code (DTC)”.
-  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

COMBINATION METER (DIAGNOSTICS) > Electrical Component Location

LOCATION



IDI10036

(1) Combination meter

CAUTION

1. AIRBAG SYSTEM




Caution:

- **Do not use the electrical test equipment on the airbag system wiring harnesses and connector circuits.**
- **Be careful not to damage the airbag system wiring harness.**

COMBINATION METER (DIAGNOSTICS) > General Description

INSPECTION


Before performing diagnosis, check the following items that might provoke the problems related to the combination meter or MFD.

- 1.** Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)  [Ref. to STARTING/CHARGING SYSTEMS\(H4DOTC\)>General Description.](#)
- 2.** Check the fuse condition.  [Ref. to INSTRUMENTATION/DRIVER INFO>Relay and Fuse.](#)
- 3.** Check the connecting condition of harness and harness connector.

COMBINATION METER (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL









ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	— (Newly adopted tool)	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".








2. GENERAL TOOL



TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

COMBINATION METER (DIAGNOSTICS) > List of Diagnostic Trouble Code (DTC)

LIST

DTC	Item	Content	Reference
B1500	FUEL SENDER OPEN DETECTED	The fuel gauge circuit is open or shorted.	 Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1500 FUEL SENDER OPEN DETECTED.
B1501	POWER SUPPLY SYSTEM ERROR DETECTION	Combination meter power supply circuit is open or shorted.	 Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1501 POWER SUPPLY SYSTEM ERROR DETECTION.
B1507	OUTSIDE TEMPERATURE SENSOR OPEN DETECTED	External air temperature sensor circuit is open or shorted.	 Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1507 OUTSIDE TEMPERATURE SENSOR OPEN DETECTED.
U0073	CAN FAILURE, BUS 'OFF' DETECTION	Detected when CAN line abnormality is detected.	 Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	Detected when CAN data from the engine control module (ECM) does not arrive.	 Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0101	LOST COMMUNICATION WITH TCM	Detected when CAN data from TCM does not arrive.	 Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Detected when CAN data from VDC CM does not arrive.	 Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0131	LOST COMMUNICATION WITH POWER	Detected when CAN data is not received from electric power steering CM.	 Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code

	STEERING CONTROL MODULE		(DTC)>DTC U0131 LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE.
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	Detected when CAN data is not received from body integrated unit.	 Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0151	LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE	Detected when CAN data is not received from airbag CM.	 Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0151 LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE.
U0156	LOST COMMUNICATION WITH INFORMATION CENTER "A"	Detected when CAN data from MFD does not arrive.	 Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0151 LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE.
U0164	LOST COMMUNICATION WITH HVAC CONTROL MODULE	Detected when CAN data is not received from A/C CM.	 Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0164 LOST COMMUNICATION WITH HVAC CONTROL MODULE.
U0181	LOST COMMUNICATION WITH HEADLAMP LEVELING CONTROL MODULE	Detected when CAN data from AHL CM does not arrive.	 Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0164 LOST COMMUNICATION WITH HVAC CONTROL MODULE.
U0327	SOFTWARE INCOMPATIBILITY WITH VEHICLE SECURITY CONTROL MODULE	Detected when CAN data is not received from keyless access CM.	 Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0327 SOFTWARE INCOMPATIBILITY WITH VEHICLE SECURITY CONTROL MODULE.
U1233	LOST COMMUNICATION WITH RAB CONTROL MODULE	Detected when CAN data from RAB CM does not arrive.	 Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1233 LOST COMMUNICATION WITH RAB CONTROL MODULE.

U1235	LOST COMMUNICATION WITH EyeSight	Detected when CAN data from the stereo camera does not arrive.	 Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1235 LOST COMMUNICATION WITH EyeSight.
U1433	INVALID DATA RECEIVED FROM EyeSight	Detected when the microcomputer of the stereo camera froze.	 Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1433 INVALID DATA RECEIVED FROM EyeSight.

COMBINATION METER (DIAGNOSTICS) > Subaru Select Monitor

INSPECTION



Detecting condition:

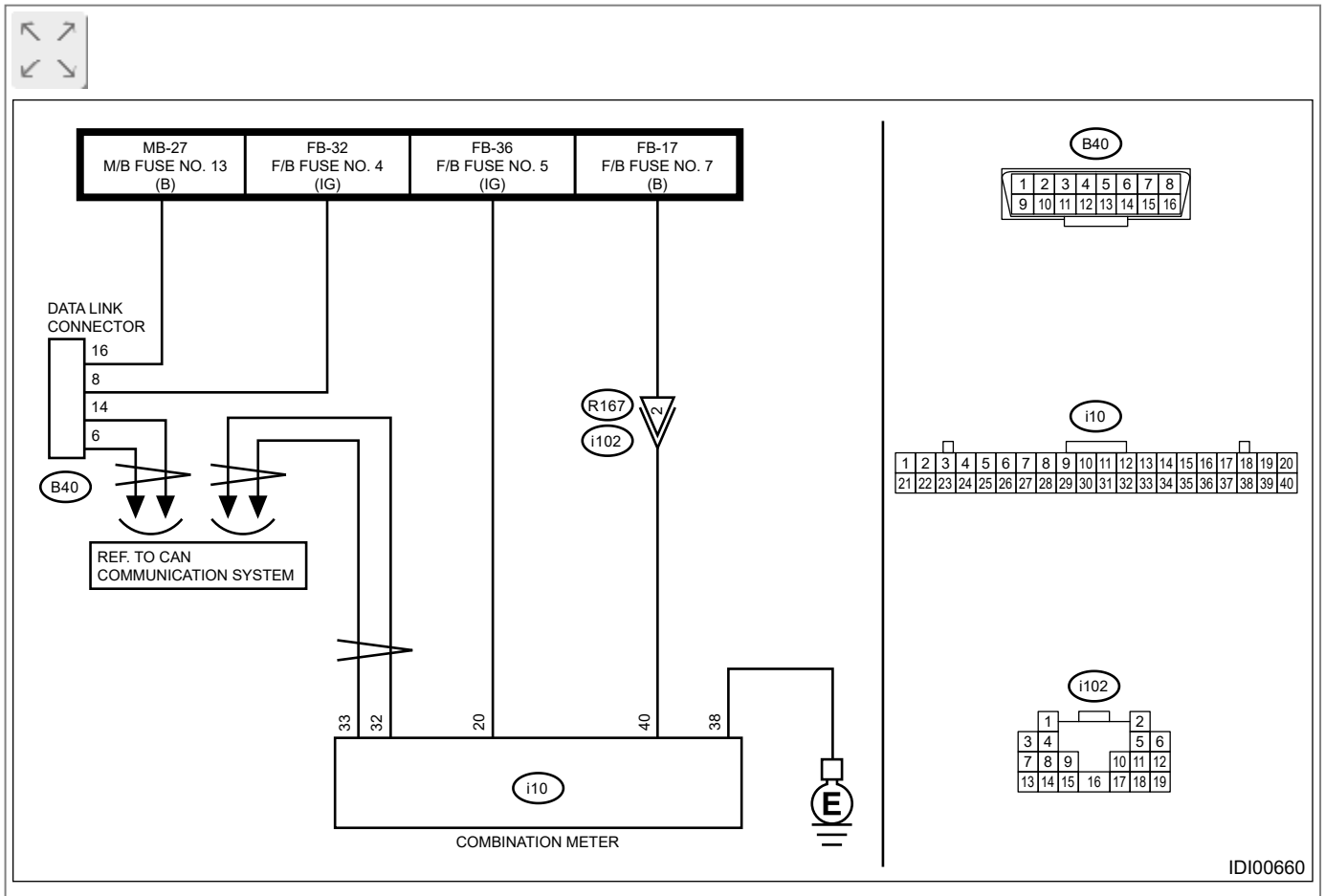
- Defective harness connector
- Power supply circuit malfunction
- Defective combination meter
- Defective CAN communication circuit
- Defective Subaru Select Monitor

Trouble symptom:


Communication is impossible between combination meter and Subaru Select Monitor.

Wiring diagram:

- Combination meter system  [Ref. to WIRING SYSTEM>Combination Meter System>WIRING DIAGRAM.](#)
- CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)



1. CHECK FUSE.

Check the fuse.  [Ref. to INSTRUMENTATION/DRIVER INFO>Relay and Fuse.](#)

Is the check result OK?

Yes

 [Go to 2.](#)

No

Replace the fuse. If the replaced fuse blows out easily, repair the ground short circuit in the harness between the battery — combination meter.

2. CHECK HARNESS (OPEN CIRCUIT).



1. Turn the ignition switch to OFF.
2. Disconnect the connector of combination meter.
3. Turn the ignition switch to ON.
4. Use a tester to measure the voltage between the combination meter connector and chassis ground.

Connector & terminal

(i10) No. 20 (+) — Chassis ground (-):

(i10) No. 40 (+) — Chassis ground (-):

Is the voltage 10 — 13 V?

Yes

 [Go to 3.](#)

No

Repair the open circuit of harness between combination meter connector and fuse.

3. CHECK HARNESS (OPEN CIRCUIT).



Use a tester to measure the resistance between the combination meter connector and chassis ground.

Connector & terminal

(i10) No. 38 — Chassis ground:

Is the resistance less than 1 Ω ?

Yes


 [Go to 4.](#)

No

Repair the open circuit of harness between combination meter connector and chassis ground.


4. CHECK LAN SYSTEM.



Inspect LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is the check result OK?

Yes

 [Go to 5.](#)

No

Perform the inspection according to the diagnosis for LAN system.

5. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to ON.
2. Check whether communication to combination meter can be executed normally.

Is communication to combination meter possible?

Yes

The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No


 [Go to 6.](#)

6. CHECK SUBARU SELECT MONITOR.

Connecting the Subaru Select Monitor to another vehicle, communicate with the combination meter.

Is communication to combination meter possible?

Yes


Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>ELECTRICAL SPECIFICATION > COMBINATION METER ASSEMBLY.](#)

No

Repair or replace the Subaru Select Monitor.

COMBINATION METER (DIAGNOSTICS) > Subaru Select Monitor

OPERATION

- For detailed operation procedures, refer to "Application help".
- When the combination meter cannot communicate with Subaru Select Monitor, perform "COMMUNICATION FOR INITIALIZING IMPOSSIBLE".  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Subaru Select Monitor>INSPECTION.](#)

If the DTCs related to the LAN system are not displayed, perform the inspection by connecting the Subaru Select Monitor to another vehicle which is operating properly and by establishing the communication.

PROCEDURE

Caution:

- **When performing the entire diagnosis or cruise control diagnosis, first start the engine and wait until initial illumination of the ABS/VDC warning light completes. (If you start the diagnostics before performing the above procedures, the cancel code "43" is recorded and CRUISE indicator does not illuminate even though the CRUISE switch is pressed.)**
- **When performing diagnosis, observe the legal speed limit on the road.**
- **The cancel code will also appear when the cruise control is cancelled by the driver's operation. Do not confuse them.**
- **Be sure to get an assistant to support the diagnosis while driving, and have him/her operate the select monitor.**


1. CHECK MALFUNCTION INDICATOR LIGHT.




Make sure the malfunction indicator light illuminates.

Does the malfunction indicator light illuminate?

Yes

 [Go to 5.](#)

No

 [Go to 2.](#)


2. CHECK CRUISE INDICATOR LIGHT.



Make sure the cruise indicator light blinks.

Does the cruise indicator light blink?

Yes

 [Go to 7.](#)

No

 [Go to 3.](#)


3. CHECK CRUISE SWITCH OPERATION.




Check the CRUISE switch operation. (Check the illumination of the CRUISE indicator.)

Is the CRUISE switch turned to ON? (Does the CRUISE indicator illuminate?)

Yes

 [Go to 4.](#)

No


Go to phenomenon 1.  [Ref. to CRUISE CONTROL \(DIAGNOSTICS\)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON.](#)

4. CHECK CRUISE CONTROL SET OPERATION.

Check the cruise control setting operation.

Can the cruise control be set while driving at 40 km/h (25 MPH) or more?

Yes

 [Go to 8.](#)

No


 [Go to 7.](#)

5. CHECK DTC.


Read all DTCs using the Subaru Select Monitor.

Is an engine or ABS/VDC related DTC displayed?

Yes

Record the DTC.  [Go to 6.](#)

No

Go to phenomenon 2.  [Ref. to CRUISE CONTROL \(DIAGNOSTICS\)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON.](#)

6. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, check the Freeze Frame Data or Information in Trouble State.

Was the Freeze Frame Data or Information in Trouble State recorded?


Yes

Record the data. Perform the diagnosis according to the engine or ABS/VDC related DTC.

No

Perform the diagnosis according to the engine or ABS/VDC related DTC.

7. CHECK CANCEL CODE.

Using the Subaru Select Monitor, read the cancel codes.  [Ref. to CRUISE CONTROL \(DIAGNOSTICS\)>Cancel Code.](#)


Note:

- Do not turn the ignition switch to OFF after the cruise control is deactivated.
- Do not operate the cruise control command switch after the cruise control is deactivated.

If the above is performed, the cancel code will be cleared.

Is it possible to read the cancel codes?

Yes

Perform the diagnosis according to the cancel code.  [Ref. to CRUISE CONTROL \(DIAGNOSTICS\)>List of Cancel Code.](#)

No

 [Go to 8.](#)

8. CHECK SET INDICATOR.

Check the illumination of the SET indicator.


Does the SET indicator illuminate?

Yes

 [Go to 9.](#)

No

Go to phenomenon 3.


 [Ref. to CRUISE CONTROL \(DIAGNOSTICS\)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON.](#)

9. CHECK VEHICLE SPEED IS HELD WITHIN SET SPEED.


Make sure the vehicle speed is held within set speed.

Is the vehicle speed kept within setting speed ± 3 km/h (± 2 MPH)? (Make sure that on a level road.)

Yes

 [Go to 10.](#)

No

Go to phenomenon 4.  [Ref. to CRUISE CONTROL \(DIAGNOSTICS\)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE](#)


WITH PHENOMENON.

10. CHECK RES/+ OPERATION.


Check the RES/+ switch operation.

Does the vehicle speed increase or return to set speed after RES/+ switch has been pressed?

Yes

 [Go to 11.](#)

No


Go to phenomenon 5.  [Ref. to CRUISE CONTROL \(DIAGNOSTICS\)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON.](#)

11. CHECK SET/– OPERATION.


Check the SET/– switch operation.

Does the vehicle speed decrease after SET/– switch has been pressed?

Yes

 [Go to 12.](#)

No

Go to phenomenon 6.  [Ref. to CRUISE CONTROL \(DIAGNOSTICS\)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON.](#)

12. CANCEL OPERATION CHECK.


Check the CANCEL switch operation.

Is the cruise control released after CANCEL switch has been pressed?

Yes

 [Go to 13.](#)

No

Go to phenomenon 7.  [Ref. to CRUISE CONTROL \(DIAGNOSTICS\)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON.](#)

13. CHECK CRUISE CONTROL RELEASE OPERATION.



Check the cruise control release operation.

Is the cruise control released after brake pedal has been depressed?

Yes

[Go to 14.](#)

No

Go to phenomenon 8. [Ref. to CRUISE CONTROL \(DIAGNOSTICS\)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON.](#)

14. CHECK CRUISE CONTROL RELEASE OPERATION.



Check the cruise control release operation.

Is the cruise control released after shifting to the neutral position?

Yes

[Go to 15.](#)

No

Go to phenomenon 9. [Ref. to CRUISE CONTROL \(DIAGNOSTICS\)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON.](#)

15. CHECK CRUISE CONTROL RELEASE OPERATION.



Check the cruise control release operation.

Is the cruise control released after depressing the clutch pedal?

Yes

Finish the diagnosis.

No

Go to phenomenon 10. [Ref. to CRUISE CONTROL \(DIAGNOSTICS\)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON.](#)

CRUISE CONTROL (DIAGNOSTICS) > Cancel Code

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Select Vehicle] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Engine], and then select [Next].
5. Drive vehicle at 40 km/h (25 MPH) or more and set the cruise control.

Note:


When performing the entire diagnosis or cruise control diagnosis, first start the engine and wait until initial illumination of the ABS/VDC warning light completes. (If you start the diagnostics before performing the above procedures, the cancel code "43" is recorded and CRUISE indicator does not illuminate even though the CRUISE switch is pressed.)

Caution:

- **When performing diagnosis, observe the legal speed limit on the road.**
 - **The cancel code will also appear when the cruise control is cancelled by the driver's operation. Do not confuse them.**
 - **Be sure to get an assistant to support the diagnosis while driving, and have him/her operate the select monitor.**
6. When the set speed is canceled by itself (without any cancel operations such as applying brake) or when the cruise control could not be set by performing the setting operation, selecting the [Cancel Code] on the engine malfunction diagnosis screen will display the cancel code on the select monitor display.


Note:

The [Current] and [The past] are contained in the cancel code. The latest code recognized during current test drive is displayed in [Current]. Cancel codes resulting from fault diagnosis of switches relating to the system and cruise control are also displayed in [The past].

7. Perform Engine DTC Clear Memory operation.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DQ\)>Clear Memory Mode>OPERATION.](#)

Cancel codes for switches relating to the system and cruise control are deleted by clearing memory on the engine side.

Note:

- **The latest code will be cleared by turning ignition switch to OFF.**
- **For detailed operation procedures, refer to "Application help".**
- **For details on cancel codes, refer to List of Cancel Code.  [Ref. to CRUISE CONTROL \(DIAGNOSTICS\)>List of Cancel Code.](#)**

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

11

When CRUISE switch is pressed, or a malfunction related to CRUISE switch occurs, this is detected.

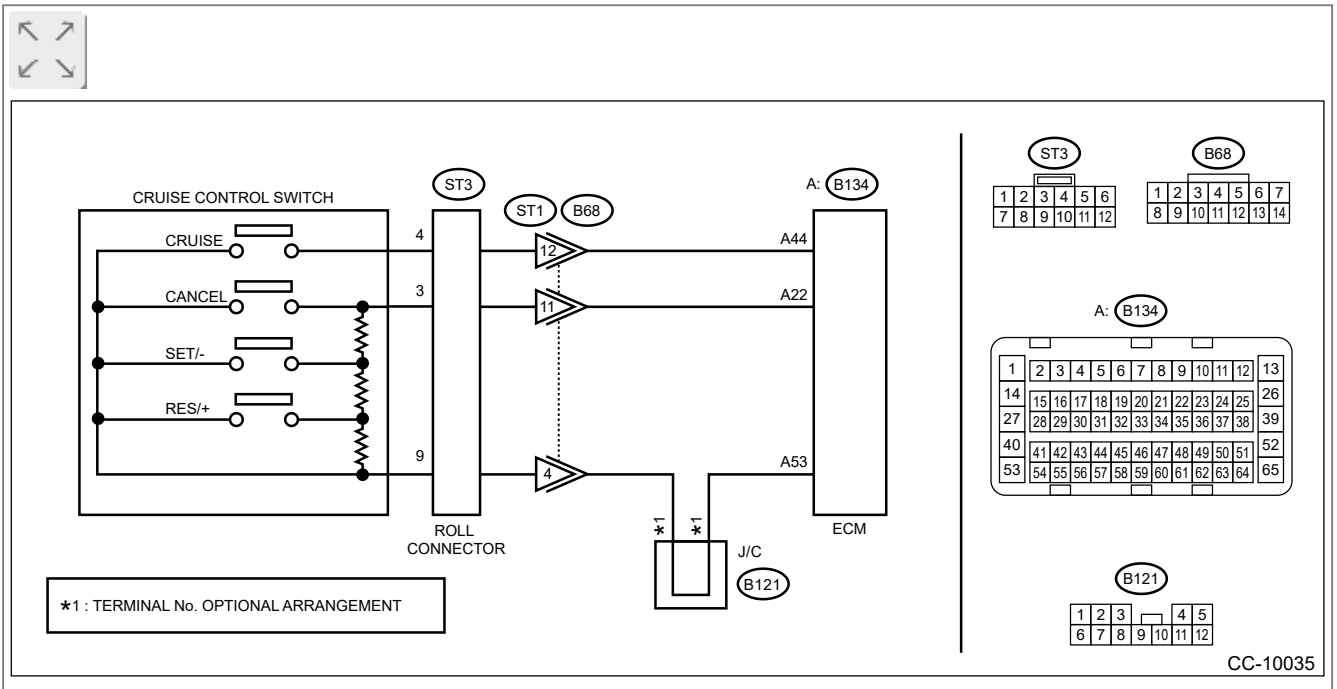
Trouble symptom:

- Cruise control cannot be set. (Cancelled immediately.)
- Cruise control cannot be released.

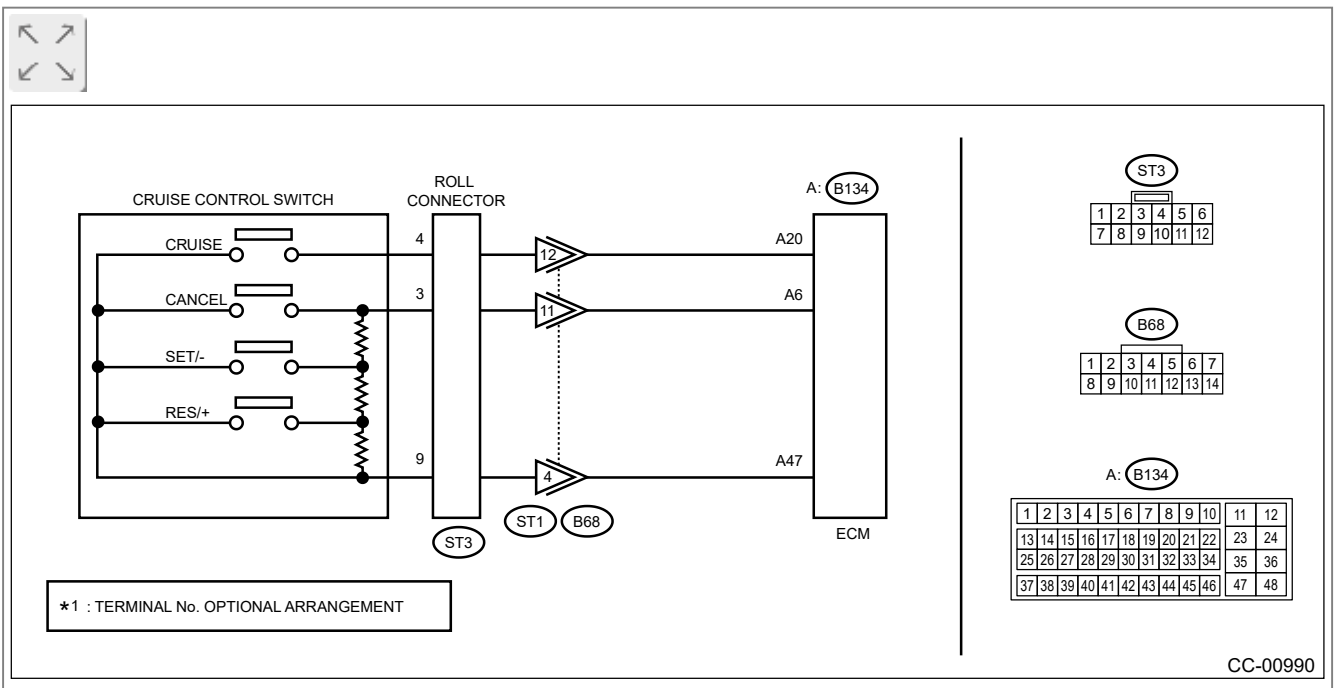
Wiring diagram:

Cruise control system  [Ref. to WIRING SYSTEM>Cruise Control System>WIRING DIAGRAM.](#)


- Non-turbo model



- Turbo model



1. CHECK CRUISE CONTROL COMMAND SWITCH CIRCUIT.

1. Remove the driver's airbag module.  [Ref. to AIRBAG SYSTEM>Driver's Airbag Module>REMOVAL.](#)
2. Disconnect the harness connector of cruise control command switch.
3. Turn the ignition switch to ON.
4. Measure the voltage between harness connector terminal and chassis ground.


Connector & terminal

(ST3) No. 4 (+) — Chassis ground (-):

(ST3) No. 3 (+) — Chassis ground (-):

Is the voltage 5 V or more?


Yes

 [Go to 2.](#)

No

Check the harness between cruise control command switch and ECM, and the steering roll connector for open or short circuit, or for poor contact.

2. CHECK CRUISE CONTROL COMMAND SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Remove the cruise control command switch.  [Ref. to CRUISE CONTROL SYSTEM>Cruise Control Command Switch>REMOVAL.](#)
3. Measure the resistance between harness connector terminal and chassis ground.

Connector & terminal

(ST3) No. 9 — Chassis ground:

Is the resistance less than 10 Ω ?

Yes

 [Go to 3.](#)

No

Check for open circuit between cruise control command switch, ECM, and chassis ground and check the ECM.

3. CHECK CRUISE CONTROL COMMAND SWITCH.


Measure the resistance between switch terminals when the cruise control command switch is not depressed.

Terminals

No. 3 — No. 9:


Is the resistance approx. 4 k Ω ?

Yes


 [Go to 4.](#)

No

Replace the cruise control command switch.

 [Ref. to CRUISE CONTROL SYSTEM>Cruise Control Command Switch.](#)

4. CHECK CANCEL SWITCH.


1. Turn the ignition switch to OFF.
2. Remove the cruise control command switch.  [Ref. to CRUISE CONTROL SYSTEM>Cruise Control Command Switch>REMOVAL.](#)
3. Measure the resistance between switch terminals with the CANCEL switch pressed.

Terminals

No. 3 — No. 9:


Is the resistance approx. less than 1 Ω when the CANCEL switch is pressed?

Yes

 [Go to 5.](#)

No

Replace the cruise control command switch.

 [Ref. to CRUISE CONTROL SYSTEM>Cruise Control Command Switch.](#)

5. CHECK SET/– SWITCH.

Measure the resistance between the switch terminals with the SET/– switch pressed.

Terminals


No. 3 — No. 9:

Is the resistance approx. 250 Ω when the SET/– switch is pressed?

Yes

 [Go to 6.](#)

No

Replace the cruise control command switch.  [Ref. to CRUISE CONTROL SYSTEM>Cruise Control Command Switch.](#)


6. CHECK RES/+ SWITCH CIRCUIT.

Measure the resistance between the switch terminals with the RES/+ switch pressed.



Terminals

No. 3 — No. 9:


Is the resistance approx. 1,500 Ω when the RES/+ switch is pressed?

 Replace the ECM.

Yes

 [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)

No

Replace the cruise control command switch.  [Ref. to CRUISE CONTROL SYSTEM>Cruise Control Command Switch.](#)

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

12

Detected when the brake pedal is depressed, or the error related to the stop light & brake switch occurred.

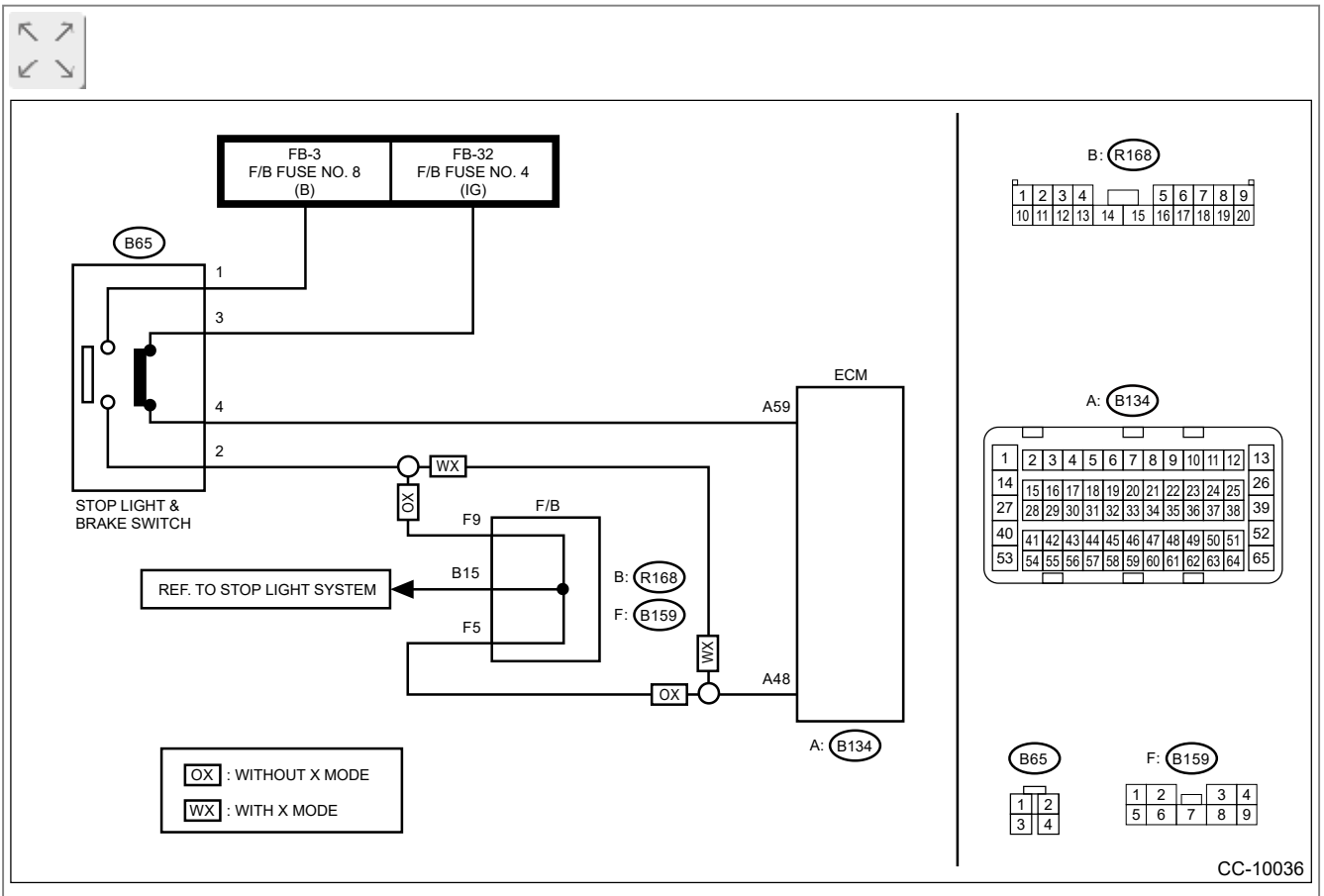
Trouble symptom:

- Cruise control cannot be set.
- Cruise control cannot be released.

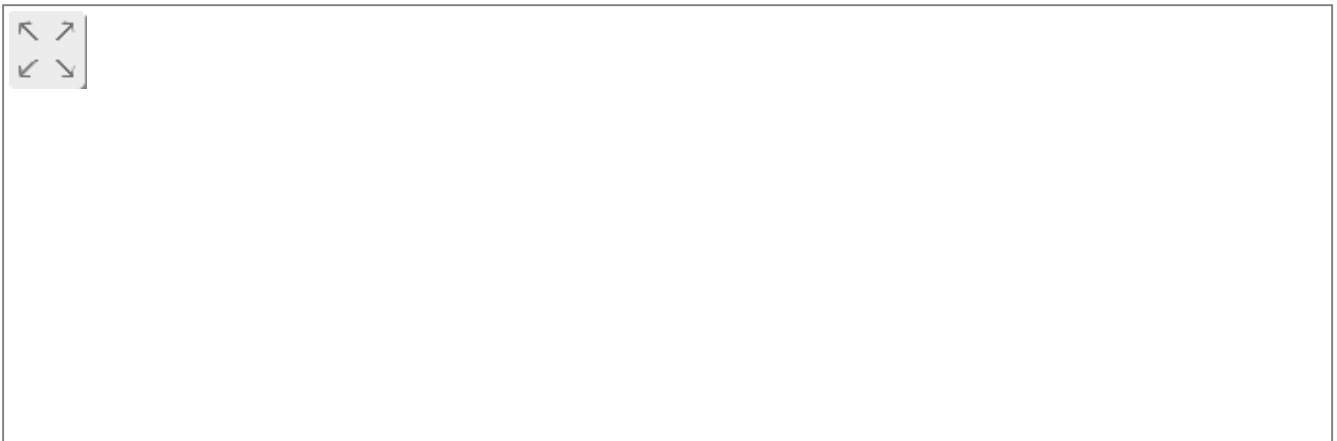
Wiring diagram:

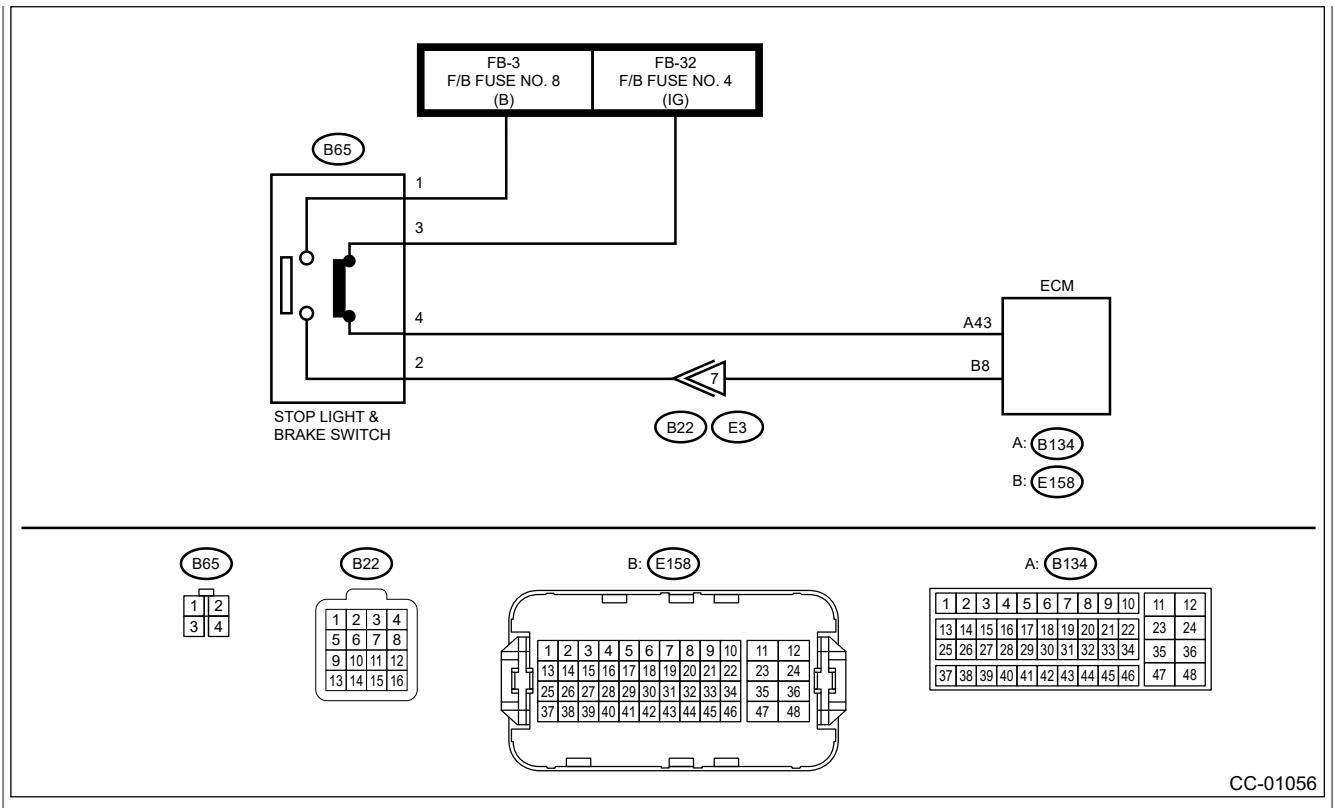
Cruise control system  [Ref. to WIRING SYSTEM>Cruise Control System>WIRING DIAGRAM.](#)

- Non-turbo model



- Turbo model





1. CHECK STOP LIGHT & BRAKE SWITCH.

Check the stop light & brake switch. [Ref. to CRUISE CONTROL SYSTEM>Stop Light & Brake Switch.](#)

Are the check results for the stop light & brake switch unit, and installation position OK?

Yes

[Go to 2.](#)

No

Replace the stop light & brake switch. Or adjust the installation position.

2. CHECK STOP LIGHT & BRAKE SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the stop light & brake switch harness connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between harness connector terminal and chassis ground.

Connector & terminal

(B65) No. 1 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

[Go to 3.](#)

No

- Check fuse No. 8 (in fuse & relay box).
- Check for open or short circuit in harness between the stop light & brake switch and the fuse & relay box.

3. CHECK STOP LIGHT & BRAKE SWITCH CIRCUIT.




Measure the voltage between harness connector terminal and chassis ground.

Connector & terminal

(B65) No. 3 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

- Check fuse No. 4 (in fuse & relay box).
- Check for open or short circuit in harness between the stop light & brake switch and the fuse & relay box.

4. CHECK STOP LIGHT & BRAKE SWITCH CIRCUIT.



1. Turn the ignition switch to OFF.
2. Disconnect the harness connector of ECM.
3. Measure the resistance between ECM harness connector terminal and stop light & brake switch harness connector terminal.

Connector & terminal

Non-turbo model

(B134) No. 59 — (B65) No. 4:

(B137) No. 48 — (B65) No. 2:

Turbo model



(E158) No. 8 — (B65) No. 2:

(B134) No. 43 — (B65) No. 4:

Is the resistance less than 10 Ω ?

Yes

Replace the ECM.

 [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)

No

Repair the harness.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

13

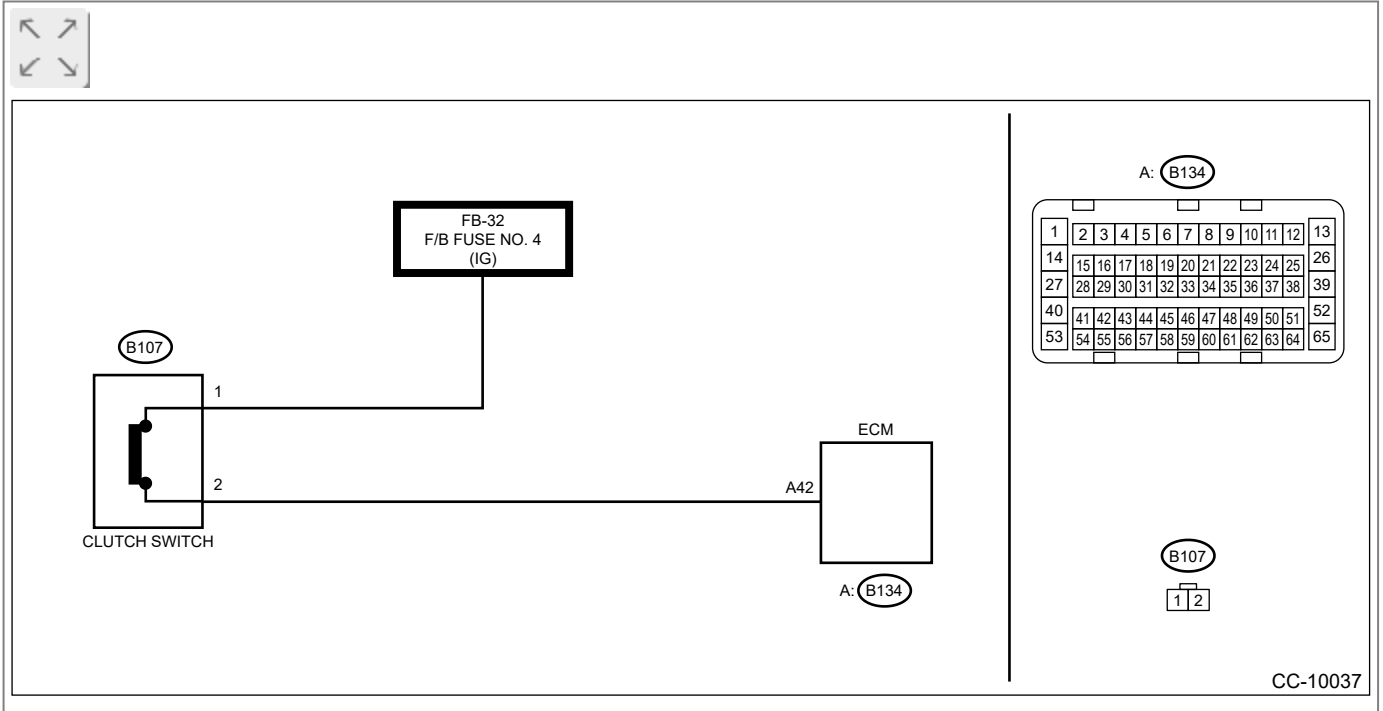
Detected when clutch pedal is depressed or malfunction related to clutch switch occurs.

Trouble symptom:

- Cruise control cannot be set.
- Cruise control cannot be released.

Wiring diagram:

Cruise control system  [Ref. to WIRING SYSTEM>Cruise Control System>WIRING DIAGRAM.](#)




1. CHECK CLUTCH SWITCH.

Check the clutch switch.  [Ref. to CRUISE CONTROL SYSTEM>Clutch Switch.](#)

Is the check result of the clutch switch unit and installation position OK?

Yes

 [Go to 2.](#)

No

Replace the clutch switch. Or adjust the installation position.

2. CHECK CLUTCH SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the clutch switch harness connector.
3. Turn the ignition switch to ON.


4. Measure the voltage between harness connector terminal and chassis ground.

Connector & terminal

(B107) No. 1 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 3.](#)

No

- Check fuse No. 4 (in fuse & relay box).
- Check open or shorted circuit of harness between clutch switch and fuse & relay box.

3. CHECK CLUTCH SWITCH CIRCUIT.



- 1.** Turn the ignition switch to OFF.
- 2.** Disconnect the harness connector of ECM.
- 3.** Measure the resistance between clutch switch harness connector terminal and ECM harness connector terminal.



Connector & terminal

(B107) No. 2 — (B134) No. 42:

Is the resistance less than 10 Ω ?

Yes

Replace the ECM.

 [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)

No

Repair the harness.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

14

Detected when the select lever is shifted to the neutral position, or when an error related to the neutral position switch occurs.

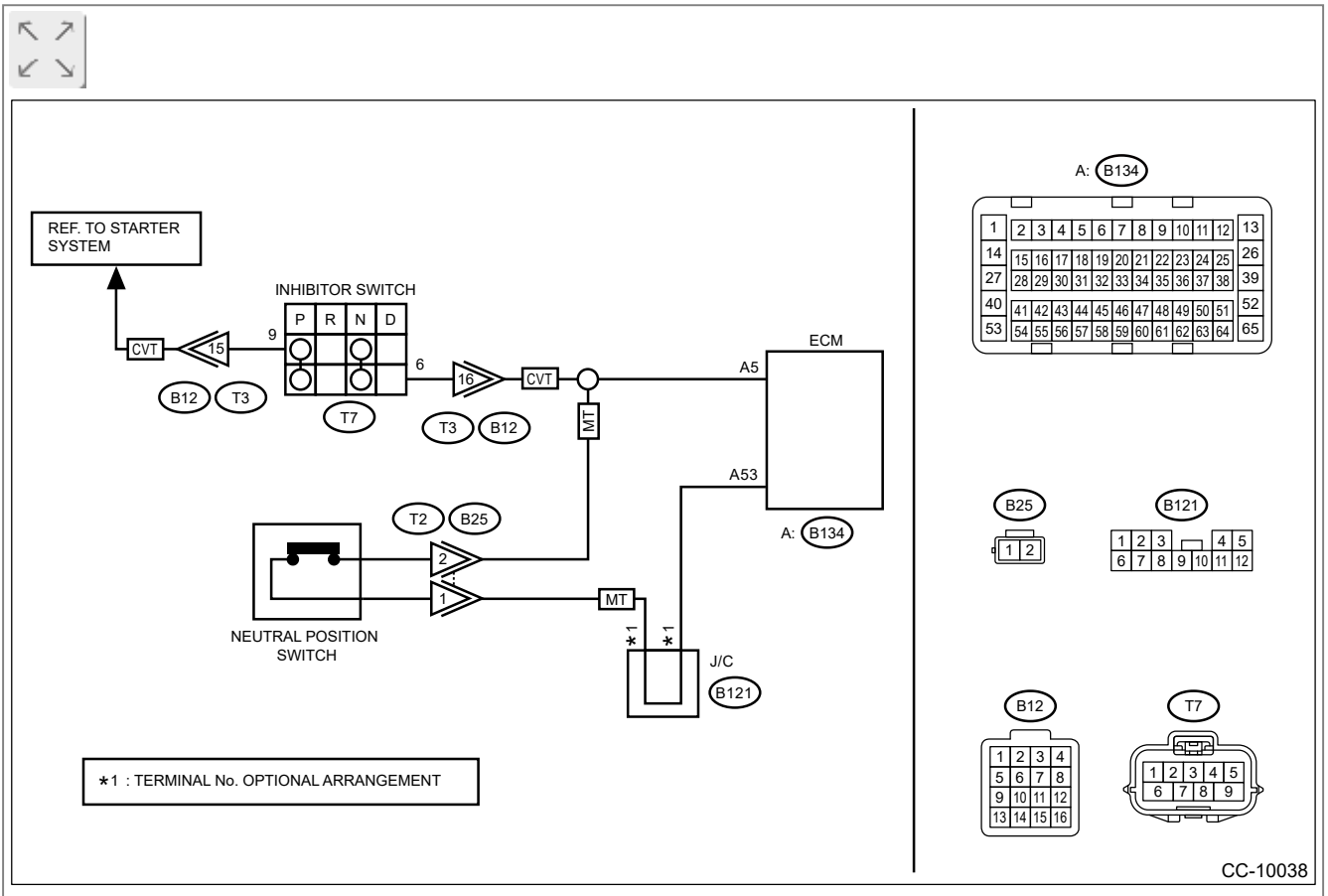
Trouble symptom:

Cruise control cannot be set.

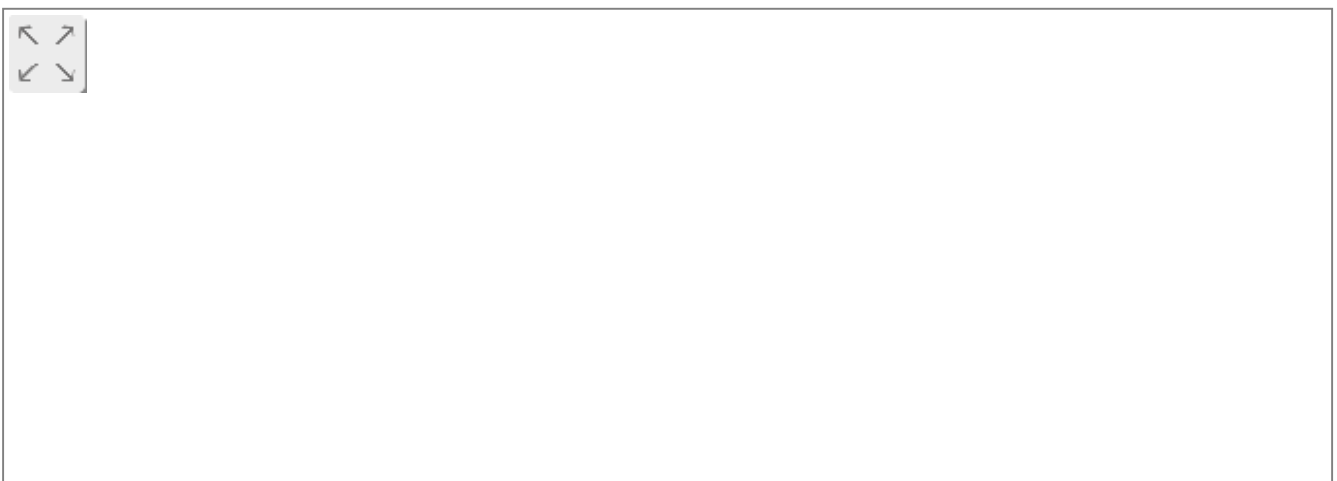
Wiring diagram:

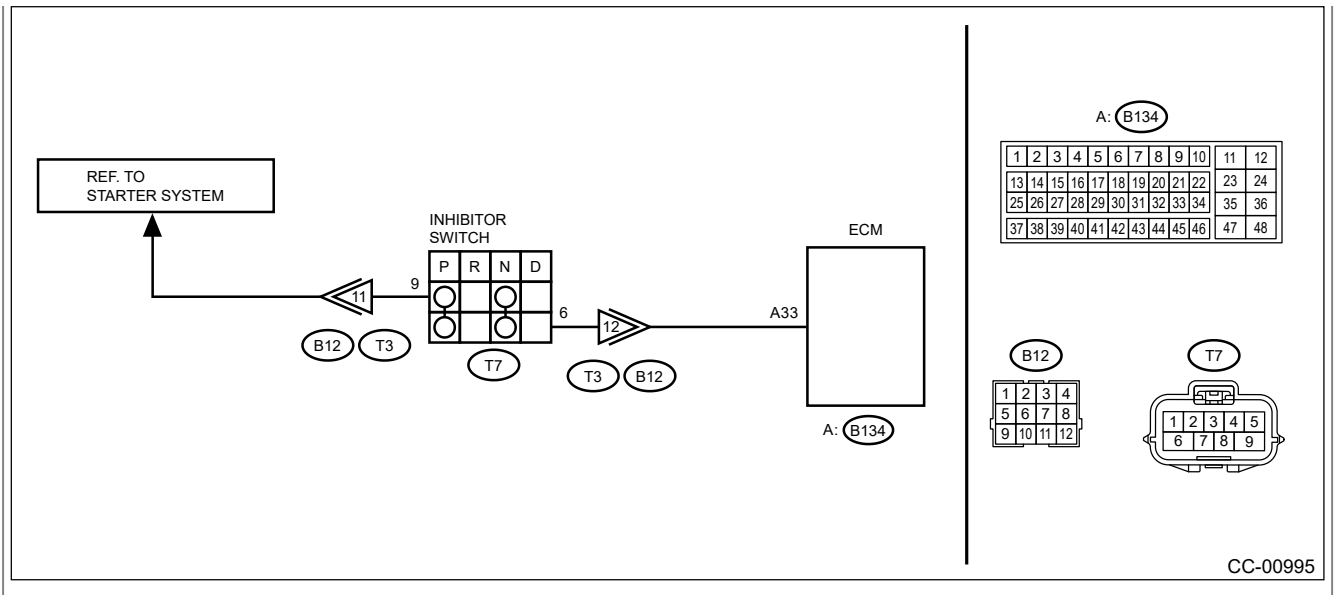
Cruise control system  [Ref. to WIRING SYSTEM>Cruise Control System>WIRING DIAGRAM.](#)

- Non-turbo model



- Turbo model





1. CHECK TRANSMISSION TYPE.

Is the transmission type CVT?

[Go to 2.](#)

[Go to 5.](#) (MT model)

2. CHECK INHIBITOR SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the inhibitor switch harness connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between harness connector terminal and chassis ground.

Connector & terminal

(T7) No. 6 (+) — Chassis ground (-):

Is the voltage 10 V or more?

[Go to 3.](#)

Check for open or short circuit in the harness between inhibitor switch and ECM.

3. CHECK INHIBITOR SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.


2. Disconnect the starter motor harness connector.
3. Measure the resistance between the inhibitor switch harness connector terminal and the starter motor.

Connector & terminal

(T7) No. 9 – Starter motor:

Is the resistance less than 10 Ω?


Yes

 [Go to 4.](#)

No

Repair the harness.



4. CHECK INHIBITOR SWITCH.

Remove and check the inhibitor switch.  [Ref. to CRUISE CONTROL SYSTEM>Inhibitor Switch.](#)

Is the check result OK?

Yes

Replace the ECM.

 [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)

No

Replace the inhibitor switch.

5. CHECK NEUTRAL POSITION SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the neutral position switch harness connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between harness connector terminal and chassis ground.

Connector & terminal

(B25) No. 2 (+) – Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 6.](#)

No

Check for open or short in the harness between neutral position switch and ECM.

6. CHECK NEUTRAL POSITION SWITCH CIRCUIT.


1. Turn the ignition switch to OFF.
2. Measure resistance between harness connector terminal of neutral position switch and chassis ground.

Connector & terminal

(B25) No. 1 — Chassis ground:

Is the resistance less than 10 Ω?


Yes

 [Go to 7.](#)

No

Repair the harness.



7. CHECK NEUTRAL POSITION SWITCH.

Remove and check the neutral position switch.  [Ref. to CRUISE CONTROL SYSTEM>Neutral Position Switch.](#)

Is the check result OK?

Yes

Replace the ECM.

 [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)

No

Replace the neutral position switch.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

15

Detected when CANCEL switch is pressed or malfunction related to CRUISE switch occurs.

Trouble symptom:

- Cruise control cannot be set. (Cancelled immediately.)
- Cruise control cannot be released.

Refer to 11 for diagnostic procedure.

 [Ref. to CRUISE CONTROL \(DIAGNOSTICS\)>Diagnostic Procedure with Cancel Code>11.](#)

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

16

Detected when ignition switch is turned to OFF or malfunction related to the ignition switch occurs.

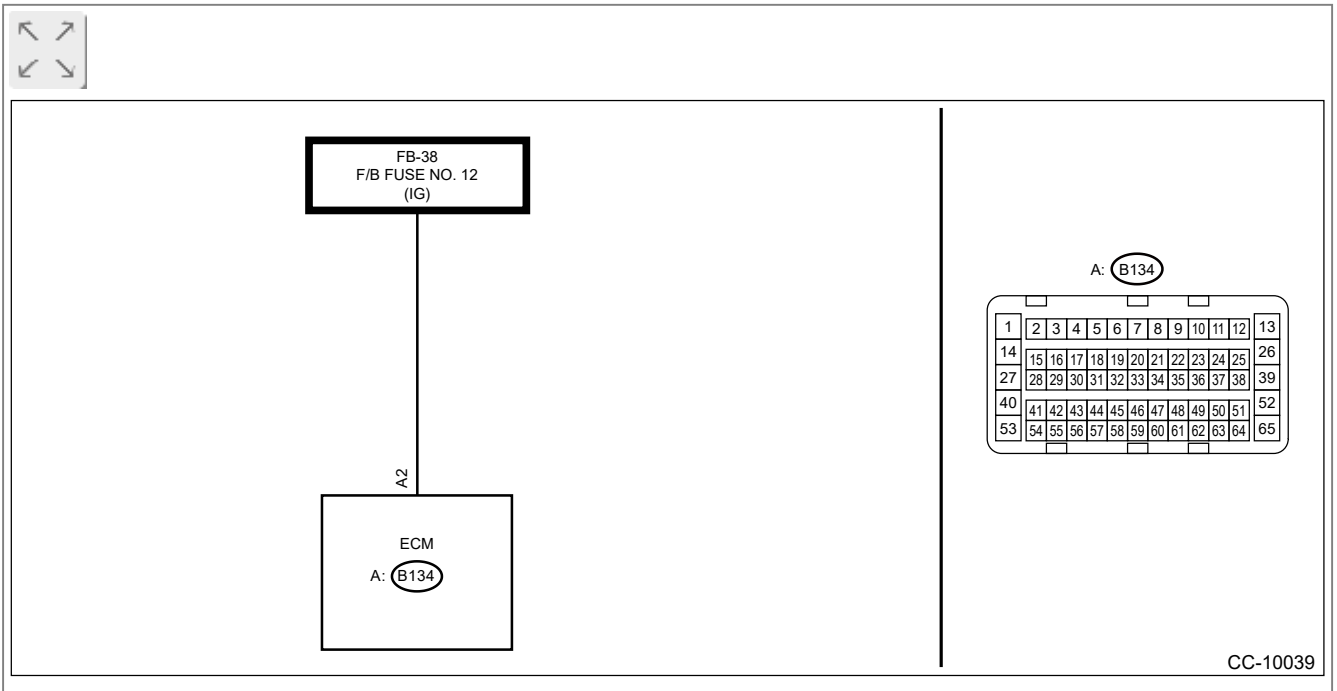
Trouble symptom:

Cruise control cannot be set.

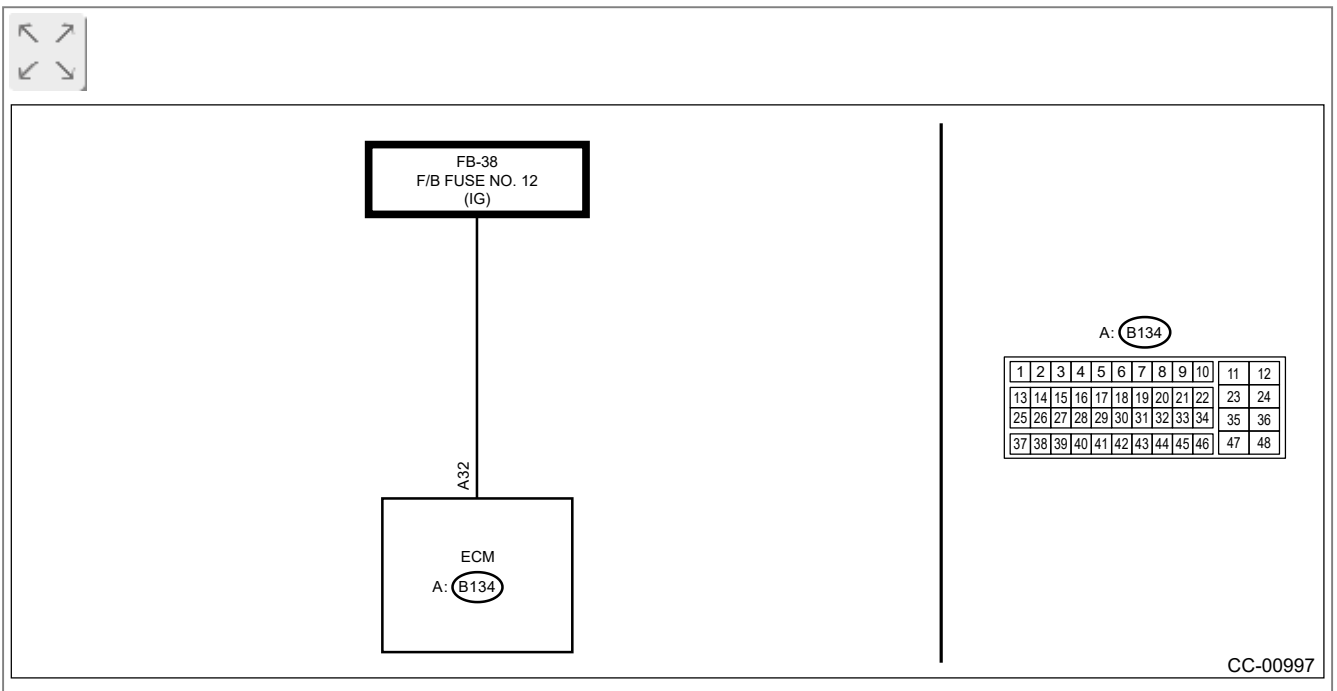
Wiring diagram:

Cruise control system  Ref. to [WIRING SYSTEM>Cruise Control System>WIRING DIAGRAM.](#)

- Non-turbo model



- Turbo model



1. CHECK IGNITION SWITCH CIRCUIT.



1. Turn the ignition switch to OFF.
2. Disconnect the ECM harness connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between harness connector terminal and chassis ground.

Connector & terminal

Non-turbo model

(B134) No. 2 (+) — Chassis ground (–):

Turbo model

(B134) No. 32 (+) — Chassis ground (–):

Is the voltage 10 V or more?

Yes

Check for poor contact of ECM connector.

No

- Check fuse No. 12 (in fuse & relay box).
- Check the harness for open or short circuit between ignition switch and ECM.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

21

Cruise control command switch malfunction is detected.

Trouble symptom:

- Cruise control cannot be set. (Cancelled immediately.)
- Cruise control cannot be released.

Refer to 11 for diagnostic procedure.

 [Ref. to CRUISE CONTROL \(DIAGNOSTICS\)>Diagnostic Procedure with Cancel Code>11.](#)

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

22

Malfunction related to vehicle speed sensor is detected.

Diagnosis:

Open or short circuit in the vehicle speed sensor system.

Trouble symptom:

Cruise control cannot be set. (Cancelled immediately.)


1. CHECK ABS OR VDC WARNING LIGHT.

1. Turn the ignition switch to ON.
2. After the initial operation of the combination meter finished, check if the ABS or VDC warning light stays illuminated.

Does the warning light stay illuminated?

Yes


Check the VDCCM.

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No


 [Go to 2.](#)

2. CHECK DTC OF LAN COMMUNICATION CIRCUIT.

Read the DTC of body integrated unit using Subaru Select Monitor.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)



Is DTC displayed?

Yes

Perform the diagnosis for the displayed DTCs.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Replace the ECM.

 [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DQ\)>Engine Control Module \(ECM\).](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

24

Malfunction in cruise control-related switch is detected.

Trouble symptom:

- Cruise control cannot be set. (Cancelled immediately.)
- Cruise control cannot be released.

Refer to 11 for diagnostic procedure.

 [Ref. to CRUISE CONTROL \(DIAGNOSTICS\)>Diagnostic Procedure with Cancel Code>11.](#)

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

31

Engine speed signal malfunction is detected.

Abnormal increase of engine speed is detected.

Gear is placed in 1st or Reverse position.

System entered X MODE.

After canceling X MODE, drive the vehicle at the 2nd gear position or higher and perform the cruise setting again. If a cancel code is not detected, it is normal.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

32

Detected when the vehicle speed is out of the system controllable range.

Increase vehicle speed high enough to allow the cruise control to function, and then perform setting operation again.

If cancel code is still detected after setting cruise again, perform the diagnosis for DTC 22.

Refer to 22 for diagnostic procedure.

 [Ref. to CRUISE CONTROL \(DIAGNOSTICS\)>Diagnostic Procedure with Cancel Code>22.](#)

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

34

The vehicle has been driven at a speed higher than set speed for a long time (approximately 10 minutes) during cruise driving.

This cancel code is detected when driving for a long period of time at a speed higher than appropriate for cruise control setting by operating the accelerator pedal.

Perform the cruise control setting operation again. If the cancel code is not detected, it is normal.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

35

Detected when it is impossible to perform the vehicle speed feedback.

Set vehicle speed cannot be kept for some reasons (steep uphill, unreleased parking brake, etc.) during cruise driving.

Cancel code is detected when driving condition is not suitable for cruise control.

Perform cruise set operation again after clearing the possible cause.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

41


VDC/TCS/EPB is operated.

Vehicle dynamics control (VDC) or TCS/EPB is operated during cruise driving or cruise setting.

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code


43

- The situation that some or all functions for ABS/VDC can not work is detected.
During cruise driving or cruise setting, the situation that some or all functions for ABS/VDC can not work is detected.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)
- CRUISE indicator does not illuminate even though you pressed the CRUISE switch before starting the engine.
Detected when the CRUISE switch is pressed during the initial diagnosis of ABS/VDC. It is normal if the CRUISE indicator illuminates when you press the CRUISE switch again after starting the engine and confirming that the initial illumination of the ABS/VDC warning light has been ended.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

44


Body integrated unit malfunction is detected.

Body integrated unit system malfunction is detected during cruise driving or cruise setting.  [Ref.](#)
[to BODY CONTROL\(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

45

Combination meter malfunction is detected.

Combination meter malfunction is detected during cruise driving or cruise setting.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

49

Automatic transmission malfunction is detected.

Automatic transmission malfunction is detected during cruise driving or cruise control setting.

 [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

61

Malfunction in the stop light & brake switch is detected.

Trouble symptom:

- Cruise control cannot be set.
- Cruise control cannot be released.

Refer to 12 for diagnostic procedure.

 [Ref. to CRUISE CONTROL \(DIAGNOSTICS\)>Diagnostic Procedure with Cancel Code>12.](#)

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

62

Neutral position switch malfunction is detected.

Trouble symptom:

Cruise control cannot be set.

Refer to 14 for diagnostic procedure.

 [Ref. to CRUISE CONTROL \(DIAGNOSTICS\)>Diagnostic Procedure with Cancel Code>14.](#)

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

63

Malfunction of vehicle speed signal variation is detected.

Trouble symptom:

Cruise control cannot be set. (Cancelled immediately.)

Refer to 22 for diagnostic procedure.

 [Ref. to CRUISE CONTROL \(DIAGNOSTICS\)>Diagnostic Procedure with Cancel Code>22.](#)

Note:



This cancel code may be detected when the vehicle suddenly started with VDC OFF on low μ road surface. In this case, restart the engine and perform the cruise control setting operation again. If the cancel code is not detected, it is normal.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

64

Malfunction related to engine is detected.

Refer to the Engine Diagnostic Procedure for diagnostic procedure.

 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Basic Diagnostic Procedure>PROCEDURE.](#)  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Basic Diagnostic Procedure>PROCEDURE.](#)

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

65

Cruise control command switch malfunction is detected.

While the command switch is pressed ON for a long time (approximately two minutes), stuck ON condition is detected.

Trouble symptom:

- Cruise control cannot be set. (Cancelled immediately.)
- Cruise control cannot be released.

Refer to 11 for diagnostic procedure.



 [Ref. to CRUISE CONTROL \(DIAGNOSTICS\)>Diagnostic Procedure with Cancel Code>11.](#)

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

66

Cruise control calculation malfunction is detected.

Refer to the Engine Diagnostic Procedure for diagnostic procedure.

 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Basic Diagnostic Procedure>PROCEDURE.](#)  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Basic Diagnostic Procedure>PROCEDURE.](#)


CHECK CRUISE INDICATOR LIGHT AND CRUISE SET INDICATOR LIGHT

Trouble symptom:

Cruise control can be set, but the CRUISE indicator and SET indicator do not illuminate.


1. CHECK CRUISE INDICATOR LIGHT AND CRUISE SET INDICATOR LIGHT.




Check the combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Active Test.](#)

Do the CRUISE & SET indicators illuminate?

Yes


 [Go to 2.](#)

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)


2. CHECK LAN SYSTEM.




Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is DTC for LAN system displayed?

Yes











Perform the diagnosis according to DTC for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)








No





Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Engine Control Module \(ECM\).](#)

CRUISE CONTROL (DIAGNOSTICS) > Diagnostics with Phenomenon

DIAGNOSTIC PROCEDURE WITH PHENOMENON

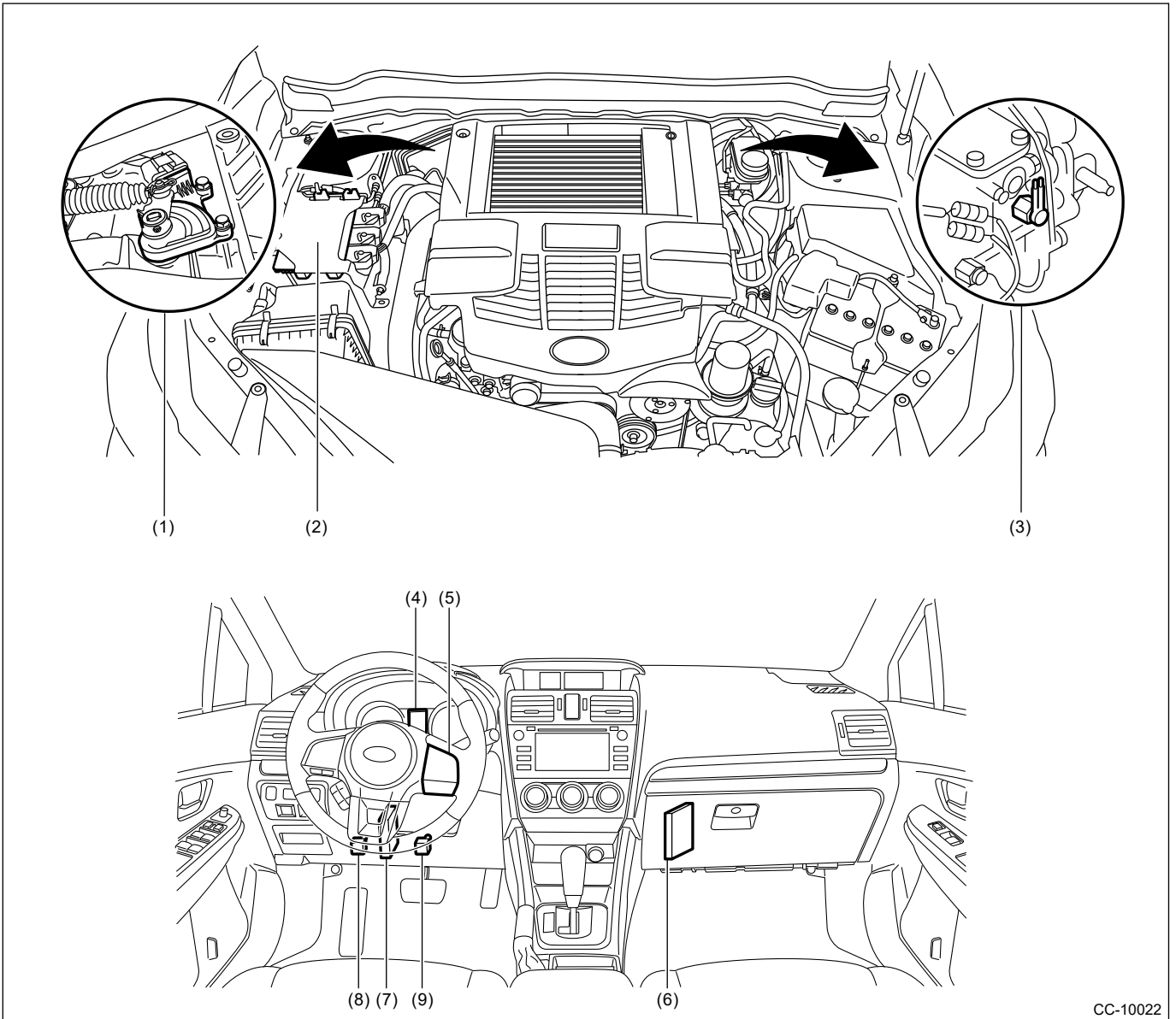
	Phenomenon	Check Item	Note
1	CRUISE switch is not turned ON. (CRUISE indicator does not illuminate.) Or cruise control was canceled without operating the CRUISE switch.	(1) Perform cruise cancel conditions diagnosis. (2) Perform the real-time diagnosis. (3) Check the cruise control command switch. (4) Check the CRUISE indicator.	Perform the diagnosis according to displayed cancel code.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>List of Cancel Code. Check the input signal of cruise control system. Refer to the cancel code 11.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>11. Refer to CHECK CRUISE INDICATOR LIGHT AND CRUISE SET INDICATOR LIGHT.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostics with Phenomenon>CHECK CRUISE INDICATOR LIGHT AND CRUISE SET INDICATOR LIGHT.
2	Cruise control cannot be set. Or cruise control is cancelled without releasing operation.	(1) Perform cruise cancel conditions diagnosis. (2) Perform the real-time diagnosis. (3) Check the cruise control command switch. (4) Check stop light switch and brake switch. (5) Check clutch switch. (6) Check the neutral position switch.	Perform the diagnosis according to displayed cancel code.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>List of Cancel Code. Check the input signal of cruise control system. Refer to the cancel code 11.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>11. Refer to Stop Light Switch.  Ref. to BRAKE>Stop Light Switch. Refer to the cancel code 12.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>12. Refer to Clutch Switch.  Ref. to CLUTCH SYSTEM>Clutch Switch. Refer to the cancel code 13.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>13. Refer to the cancel code 14.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>14.

			Refer to the cancel code 62.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>62.
		(7) Check vehicle speed sensor.	Refer to the cancel code 22.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>22.
3	SET indicator does not illuminate.	Check the SET indicator.	Refer to CHECK CRUISE INDICATOR LIGHT AND CRUISE SET INDICATOR LIGHT.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostics with Phenomenon>CHECK CRUISE INDICATOR LIGHT AND CRUISE SET INDICATOR LIGHT.
4	Vehicle speed is not held within set speed ± 3 km/h (± 2 MPH).	Check the vehicle speed sensor.	Refer to the cancel code 22.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>22.
5	Vehicle speed does not increase or does not return to set speed after RES/+ switch has been pressed.	(1) Perform the real-time diagnosis.	Check the input signal of cruise control system.
		(2) Check the RES/+ switch.	Refer to the cancel code 11.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>11.
6	Vehicle speed does not decrease after SET/- switch has been pressed.	(1) Perform the real-time diagnosis.	Check the input signal of cruise control system.
		(2) Check the SET/- switch.	Refer to the cancel code 11.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>11.
7	Cruise control is not released after CANCEL switch has been pressed.	(1) Perform the real-time diagnosis.	Check the input signal of cruise control system.
		(2) Check the CANCEL switch.	Refer to the cancel code 11.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>11.
8	Cruise control is not released after brake pedal has been depressed.	(1) Perform the real-time diagnosis.	Check the input signal of cruise control system.
		(2) Check stop light switch and brake switch.	Refer to Stop Light Switch.  Ref. to BRAKE>Stop Light Switch>INSTALLATION. Refer to the cancel code 12.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>12.

9	Cruise control is not released after shifting to the neutral position.	(1) Perform the real-time diagnosis.	Check the input signal of cruise control system.
		(2) Check the neutral position switch.	<p>Refer to Neutral Position Switch.  Ref. to CRUISE CONTROL SYSTEM>Neutral Position Switch.</p> <p>Refer to the cancel code 14.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>14.</p>
10	Cruise control is not released after clutch pedal has been depressed.	(1) Perform the real-time diagnosis.	Check the input signal of cruise control system.
		(2) Check clutch switch.	<p>Refer to Clutch Switch.  Ref. to CLUTCH SYSTEM>Clutch Switch>INSTALLATION > CLUTCH SWITCH.</p> <p>Refer to the cancel code 13.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>13.</p>

CRUISE CONTROL (DIAGNOSTICS) > Electrical Component Location

LOCATION




CC-10022

- | | | |
|---|---|---|
| (1) Inhibitor switch (CVT model) | (4) Cruise indicator light and cruise set indicator light | (7) Transmission control module (CVT model) |
| (2) Engine control module (turbo model) | (5) Cruise control command switch | (8) Clutch switch (MT model) |
| (3) Neutral position switch (MT model) | (6) Engine control module (non-turbo model) | (9) Stop light & brake switch |

CRUISE CONTROL (DIAGNOSTICS) > Engine Control Module (ECM) I/O Signal

ELECTRICAL SPECIFICATION

For details on the input/output signals for the engine control module, refer to ENGINE (DIAGNOSTICS).  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Engine Control Module \(ECM\) I/O Signal>ELECTRICAL SPECIFICATION.](#)

CRUISE CONTROL (DIAGNOSTICS) > General Description

CAUTION

Airbag system wiring harness is routed near the cruise control command switch.

Caution:

- **Do not use the electrical test equipment on the airbag system wiring harnesses and connector circuits.**
- **Be careful not to damage the airbag system wiring harness when servicing the cruise control command switch. Airbag system wiring harness is routed near the cruise control command switch.**

CRUISE CONTROL (DIAGNOSTICS) > General Description

INSPECTION

Measure the battery voltage and specific gravity of electrolyte.

Standard voltage:

12 V or more


Specific gravity:

1.260 or more

CRUISE CONTROL (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	— (Newly adopted tool)	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system.

2. GENERAL TOOL




TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used for Subaru Select Monitor 4.






CRUISE CONTROL (DIAGNOSTICS) > List of Cancel Code





LIST





Note:







- The cancel code is registered even when cancel is performed intentionally by the driver.
- Cancel codes are cleared if the ignition switch is turned to OFF.
- If a different cancel code is input after a cancel code (latest code) has been input, the latest code is overwritten.
- If the cruise indicator light is flashing, a malfunction is occurring in the system or cruise control related switch. The cancel code at this time is saved even after ignition switch is OFF as a memory code of a past malfunction.
- To display a cancel code, use the Subaru Select Monitor to read the code after the cruise control is deactivated during a driving test.

Cancel code	Item	Contents of diagnosis	Note
11	Main Switch	CRUISE switch of cruise control command switch is turned to OFF, and then the cruise control is released.	This code is displayed without operating the CRUISE switch.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>11.
12	Stop & Brake switch	Stop light switch or brake switch is turned to ON, and then the cruise control is released.	This code is displayed without depressing the brake pedal.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>12.
13	Clutch Switch	Clutch switch is turned to ON, and then the cruise control is released.	This code is displayed without depressing the clutch pedal.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>13.

14	Neutral Position Switch	Neutral position switch is turned to ON, and then the cruise control is released.	This code is displayed without shifting to neutral position.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>14.
15	Cancel switch	Cancel switch is turned to ON, and then the cruise control is released.	This code is displayed without operating the cancel switch.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>15.
16	Ignition Switch	Ignition switch is turned to OFF, and then the cruise control is released.	This code is displayed without operating the ignition switch.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>16.
21	Abnormality of switches when Ignition switch on	When the ignition switch is turned to ON, each switch of cruise control command switch is already turned to ON.	This code is displayed when the ignition switch is turned to ON without operating the cruise control command switch.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>21.
22	Abnormality of change in vehicle speed	Malfunction of vehicle speed signal variation is detected.	 Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure

			with Cancel Code>22.
24	Abnormality of switches related to cruise control	Open circuit of cruise control switch is detected during cruise driving. (The system is judged as model without cruise control.)	This code is displayed with normal operation.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>24.
31	Abnormal engine speed Signal	<ul style="list-style-type: none"> • Abnormal increase of engine speed is detected. • Gear is placed in Neutral, 1st or Reverse position. • When in X mode. 	Cruise in 2nd shift position or more.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>31.
32	Cruse Control out of Range	<ul style="list-style-type: none"> • Controlled vehicle speed decreased under the limit during cruising. • Set operation was performed at vehicle speed unavailable for setting. • RESUME operation was performed without memorized vehicle speed. 	This code is displayed, though the vehicle speed is increased to the speed available for cruise set and set operation was performed again.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>32.
34	Prohibition of cruise control at continuing big Accel. angle	The vehicle has been driven at higher speed than set vehicle speed for an abnormally long time (approximately 10 minutes) during cruise driving.	This code is displayed when driving for a long period of time at higher speed than appropriate cruise set vehicle speed by operating accelerator pedal. In this case, the cruise setting is deactivated.  Ref.

			to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>34.
35	Prohibition of cruise control at vehicle speed F/B malfunction	Set vehicle speed cannot be kept because of some reasons (steep uphill, parking brake, abnormal decrease of engine output, etc.) during cruise driving.	This code is displayed when driving condition is not suitable for cruise control. Perform cruise set operation again after clearing the possible cause.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>35.
41	VDC/TCS Operating	Vehicle dynamics control (VDC), TCS or EPB is operated during cruise driving or cruise setting.	This code is displayed when driving condition is not suitable for cruise control. Perform cruise set operation again after clearing the possible cause.  Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>41.
43	ABS/VDC Failure	<ul style="list-style-type: none"> • During cruise driving or cruise setting, the situation that some or all functions for ABS or VDC can not work is detected. • CRUISE indicator does not illuminate even though you pressed the CRUISE switch before starting the engine. 	 Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>43.
44	Body Integrated unit Failure	Body integrated unit system malfunction is detected during cruise driving or cruise setting.	 Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>44.

45	Meter Failure	Combination meter malfunction is detected during cruise driving or cruise setting.	 Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>45.
49	TCM Failure	Transmission control module (TCM) malfunction is detected during cruise driving or cruise setting.	 Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>49.
61	Brake Switch Failure	Malfunction in the stop light & brake switch is detected.	 Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>61.
62	Neutral Switch Failure	Neutral position switch malfunction is detected.	 Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>62.
63	Abnormality 1 of change in vehicle speed	Malfunction of vehicle speed signal variation is detected.	 Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>63.
64	Engine Sensor Failure 1	Malfunction related to engine is detected.	 Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>64.
65	Abnormality 1 of switches related to cruise control	Cruise control command switch malfunction is detected. (When the switch is pressed ON for a long time (approximately two minutes), stuck ON condition is detected.)	 Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>65.
66	Cruise Control Calculation Error	Cruise control calculation (microcomputer) malfunction is detected.	 Ref. to CRUISE CONTROL (DIAGNOSTICS)>Di

		agnostic Procedure with Cancel Code>66.
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CRUISE CONTROL (DIAGNOSTICS) > Real-time Diagnosis

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Select Vehicle] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Engine], and then select [Next].
5. On [Select Function] display, select [Data Monitor].
6. Make sure that normal display is shown when operated as follows:
 - Depress and release the brake pedal. (Stop light switch and brake switch are turned ON.)
 - Turn the CRUISE switch to ON.
 - Turn the CANCEL switch to ON.
 - Turn the SET/– switch to ON.
 - Turn the RES/+ switch to ON.
 - Depress or release the clutch switch.
 - Place the shift lever in any position other than neutral.

Note:

For detailed operation procedures, refer to “Application help”.

CRUISE CONTROL (DIAGNOSTICS) > Subaru Select Monitor

OPERATION

1. GENERAL DESCRIPTION

The on-board diagnosis function of the cruise control system uses Subaru Select Monitor. The on-board diagnosis function operates in two categories, which are used depending on the type of problems.

1. Cruise Control Cancel Conditions Diagnosis:

- (1) This category of diagnosis requires actual vehicle driving in order to determine the cause, as when cruise speed is cancelled during driving although cruise cancel condition is not entered.
- (2) Cruise control memory in ECM stores the cancel code which occurred during driving. When there are multiple cancel code, they are shown on the Subaru Select Monitor.

Caution:

- **In the cruise control memory, not only the cruise control "cancel" occurred (although the "cancel" operation is not entered by the driver), but also the "cancel" condition input by the driver is stored.**
- **The latest memory content (latest code) is cleared when ignition switch is turned to OFF. However, memory contents set by the diagnosis of faulty switches related to the system and cruise control will remain as trouble history (memory code) after the ignition switch is turned to OFF.**

2. Real-time Diagnosis:

Real-time diagnosis function is used to determine whether or not the input signal system is in good order, according to signal emitted from switches, sensors, etc.

- (1) Vehicle cannot be driven at cruise speed when the problem occurs in the cruise control system or relevant circuits.
- (2) Monitor the signal conditions from switches and sensors.

2. BASIC OPERATION

For detailed operation procedures, refer to "Application help".

ENGINE (DIAGNOSTICS)(H4DO) > Active Test

OPERATION

Caution:

After executing the system operation check mode, clear the memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION..

Note:

For operation procedures, refer to the "Help for Subaru Select Monitor".

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Engine Control System] and select [Enter].
5. On [Select Function] display, select [Active Test].


Active test items	Contents	Execution condition
Fuel Pump Control (ON/OFF Dr.)	ON/OFF of the fuel pump can be set.	Ignition switch ON (engine OFF)
CPC Solenoid Valve	ON/OFF of the purge control solenoid valve can be set.	
Radiator Fan Relay	ON/OFF of the radiator fan relay can be set.	
A/C Compressor Relay	ON/OFF of the A/C relay can be set.	
ELCM switching valve	ON/OFF of the leak check valve assembly switching valve can be set.	
ELCM pump	ON/OFF of the leak check valve assembly vacuum pump can be set.	
Fuel Pump Control (OFF Drive)	Fuel pump can be set to OFF.	Idling
Fixed Idle Ignition Timing	Idle ignition timing can be set and fixed to 10.0°.	Idling
Idle Speed Control	Idle speed can be set to 500 — 2000 rpm.	Idling
Injection Stop Mode (Injector 1) Injection Stop Mode (Injector 2)	Injector of each cylinder can be set to stop the fuel injection.	Idling

Injection Stop Mode (Injector 3) Injection Stop Mode (Injector 4)		
Injection Quantity Control	The amount of fuel injection can be set to 0 – 20%.	Idling
EGR Valve Control (Step)	EGR control valve can be set to 0 – 255 STEP.	Idling
Alternator control	Alternator control mode can be set to one of the followings: Low mode Middle mode High mode ExHigh mode	Idling

PROCEDURE

1. ENGINE

1. CHECK ENGINE START FAILURE.


1. Ask the customer when and how the trouble occurred using the interview check list.
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Check List for Interview>CHECK.](#)
2. Start the engine.

Does the engine start?

Yes

 [Go to 2.](#)

No

Inspection using "Diagnostics for Engine Starting Failure"
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostics for Engine Starting Failure.](#)


2. CHECK ILLUMINATION OF MALFUNCTION INDICATOR LIGHT.

Does the malfunction indicator light illuminate?

Yes

 [Go to 3.](#)


No

Inspection using "General Diagnostic Table".
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>General Diagnostic Table>INSPECTION.](#)

3. CHECK COMMUNICATION STATUS.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor or general scan tool to the data link connector.
3. Turn the ignition switch to ON, and run the Subaru Select Monitor or general scan tool.

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Subaru Select Monitor".
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**


For detailed operation procedures, refer to the general scan tool operation manual.

Does Subaru Select Monitor or general scan tool communicate with vehicle normally?

Yes

 [Go to 4.](#)


No

Inspection using "Basic Diagnostic Procedure" of LAN system  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

4. CHECK DTC.



Read DTC using Subaru Select Monitor or general scan tool.

Note:


- **Subaru Select Monitor**
Refer to "Read Diagnostic Trouble Code (DTC)" for detailed operation procedure.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DQ\)>Read Diagnostic Trouble Code \(DTC\).](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is DTC displayed on Subaru Select Monitor or general scan tool?

Yes

Record DTC, time stamp, and freeze frame data, then repair the trouble cause.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DQ\)>List of Diagnostic Trouble Code \(DTC\).](#) After repair, go to the next step.  [Go to 5.](#)


Note:

- **For the time stamp, refer to LAN section.**  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>General Description>CAUTION > TIME STAMP.](#)
- **Depending on DTCs, time stamp may not be stored.**




No

Repair the related parts.

Note:


If DTC is not shown on display although the malfunction indicator light illuminates, perform the diagnosis of malfunction indicator light circuit or combination meter.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DQ\)>Malfunction Indicator Light.](#)

5. PERFORM DIAGNOSIS.

- 1.** Clear the memory.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)
- 2.** Perform the Inspection Mode or Drive Cycle.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Drive Cycle.](#)

Is DTC displayed on Subaru Select Monitor or general scan tool?

Yes

Inspect using "Diagnostic Procedure with Diagnostic Trouble Code (DTC)".
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\).](#)

No

Finish the diagnosis.

ENGINE (DIAGNOSTICS)(H4DO) > Check List for Interview

CHECK

1. CHECK LIST NO. 1

Check the following item when problem has occurred.

Note:

Use copies of this page for interviewing customers.



Customer's name		Engine No.	
Date of purchase		Fuel type	
Date of repair		Odometer reading	km
V.I.N.			miles
Weather	<input type="checkbox"/> Fine <input type="checkbox"/> Cloudy <input type="checkbox"/> Rainy <input type="checkbox"/> Snowy <input type="checkbox"/> Various/Others:		
Ambient air temperature	°C (°F)		
	<input type="checkbox"/> Hot <input type="checkbox"/> Warm <input type="checkbox"/> Cool <input type="checkbox"/> Cold		
Place	<input type="checkbox"/> Highway <input type="checkbox"/> Suburbs <input type="checkbox"/> Inner city <input type="checkbox"/> Uphill <input type="checkbox"/> Downhill <input type="checkbox"/> Rough road <input type="checkbox"/> Others:		
Engine temperature	<input type="checkbox"/> Cold <input type="checkbox"/> Warming-up <input type="checkbox"/> After warming-up <input type="checkbox"/> Any temperature <input type="checkbox"/> Others:		
Engine speed		rpm	
Vehicle speed		km/h (MPH)	
Driving conditions	<input type="checkbox"/> Not affected <input type="checkbox"/> At starting <input type="checkbox"/> While idling <input type="checkbox"/> At racing <input type="checkbox"/> While accelerating <input type="checkbox"/> While cruising <input type="checkbox"/> While decelerating		

	<input type="checkbox"/> While turning (RH/LH)		
Headlight	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	Rear defogger	<input type="checkbox"/> ON / <input type="checkbox"/> OFF
Blower	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	Audio	<input type="checkbox"/> ON / <input type="checkbox"/> OFF
A/C compressor	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	Rear entertainment system	<input type="checkbox"/> ON / <input type="checkbox"/> OFF
Radiator fan	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	Car phone	<input type="checkbox"/> ON / <input type="checkbox"/> OFF
Front wiper	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	Wireless device	<input type="checkbox"/> ON / <input type="checkbox"/> OFF
Rear wiper	<input type="checkbox"/> ON / <input type="checkbox"/> OFF		

2. CHECK LIST NO. 2

Check the following item about the vehicle's state when the malfunction indicator light turns on.

Note:

Use copies of this page for interviewing customers.



a) Other warning lights or indicators illuminate: <input type="checkbox"/> Yes / <input type="checkbox"/> No
<input type="checkbox"/> Fuel level warning light <input type="checkbox"/> Charge warning light <input type="checkbox"/> Engine coolant temperature warning light <input type="checkbox"/> Oil pressure warning light <input type="checkbox"/> ATF temperature warning light or Sport indicator light <input type="checkbox"/> Driver's control center differential indicator light <input type="checkbox"/> ABS warning light <input type="checkbox"/> VDC warning light <input type="checkbox"/> Cruise indicator light <input type="checkbox"/> SI-CRUISE warning light <input type="checkbox"/> Immobilizer indicator light <input type="checkbox"/> STEERING warning light <input type="checkbox"/> Electronic parking brake warning light <input type="checkbox"/> Glow indicator light <input type="checkbox"/> Sedimenter warning light <input type="checkbox"/> Others:
b) Fuel level
<ul style="list-style-type: none"> • Lack of fuel: <input type="checkbox"/> Yes / <input type="checkbox"/> No • Indicator position of fuel gauge: • Experienced running out of fuel: <input type="checkbox"/> Yes / <input type="checkbox"/> No
c) Intentional connecting or disconnecting of harness connectors or spark plug cords: <input type="checkbox"/> Yes / <input type="checkbox"/> No
<ul style="list-style-type: none"> • What:
d) Intentional connecting or disconnecting of hoses: <input type="checkbox"/> Yes / <input type="checkbox"/> No
<ul style="list-style-type: none"> • What:
e) Installing of other parts except genuine parts: <input type="checkbox"/> Yes / <input type="checkbox"/> No
<ul style="list-style-type: none"> • What: • Where:
f) Occurrence of noise: <input type="checkbox"/> Yes / <input type="checkbox"/> No

- From where:
- What kind:

g) Occurrence of smell: Yes / No

- From where:
- What kind:

h) Intrusion of water into engine compartment or passenger compartment: Yes / No

i) Troubles occurred

- Engine does not start.
- Engine stalls during idling.
- Engine stalls while driving.
- Engine speed decreases.
- Engine speed does not decrease.
- Rough idling
- Poor acceleration
- Back fire
- After fire
- Does not shift.
- Excessive shift shock

ENGINE (DIAGNOSTICS)(H4DO) > Clear Memory Mode

OPERATION

1. SUBARU SELECT MONITOR

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Engine Control System] and select [Enter].
5. On [Select Function] display, select [DTC].
6. On [DTC] display, select [Clear memory].

Note:

- **Initial diagnosis of electronic throttle control is performed after memory clearance. Wait for 10 seconds or more after turning the ignition switch to ON, and then start the engine.**
- **For detailed operation procedures, refer to "PC application help for Subaru Select Monitor".**

2. GENERAL SCAN TOOL

For clear memory procedures using the general scan tool, refer to "General Scan Tool Instruction Manual".

Note:

Initial diagnosis of electronic throttle control is performed after memory clearance. Wait for 10 seconds or more after turning the ignition switch to ON, and then start the engine.

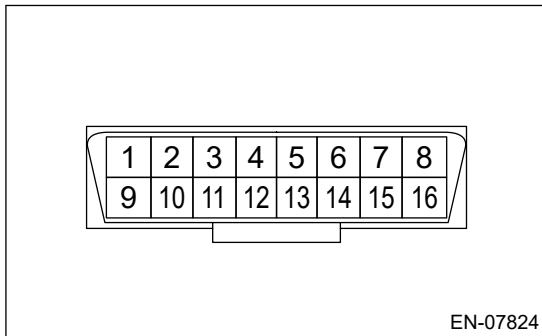
ENGINE (DIAGNOSTICS)(H4DO) > Data Link Connector

NOTE

This connector is used for Subaru Select Monitor.

Caution:

Do not connect any scan tools other than Subaru Select Monitor or general scan tool because the circuit for Subaru Select Monitor may be damaged.




Terminal No.	Contents	Terminal No.	Contents
1	Not used	9	Not used
2	Not used	10	Not used
3	Not used	11	Not used
4	Ground	12	Not used
5	Ground	13	Not used
6	CAN communication (Hi)	14	CAN communication (Lo)
7	Not used	15	Not used
8	IG2	16	Power supply

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P000A "A" CAMSHAFT POSITION SLOW RESPONSE BANK 1

Note:

For the diagnostic procedure, refer to DTC P0011.  Ref. to [ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0011 "A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1.](#)

1. OUTLINE OF DIAGNOSIS

Detect the AVCS system malfunction.

Judge NG when the amount of AVCS actual timing advance does not approach to the amount of AVCS target timing advance.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
AVCS control	In operation
Target timing advance change amount (per 64 ms)	$< 3.2^\circ\text{CA}$

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

When the differences of target timing advance amount and actual timing advance amount is calculated during AVCS control, and the difference per predetermined time is the specified value or larger.

Judge as NG when the following conditions are established within the predetermined time.

Judgment value

Malfunction Criteria	Threshold Value
$\Sigma(\text{Target position} - \text{Actual position})$ or	$> 4000^\circ\text{CA}$ (bank 1) $> 4000^\circ\text{CA}$ (bank 2)
$\Sigma(\text{Target position} - \text{Actual position})$	$< -4000^\circ\text{CA}$ (bank 1) $< -4000^\circ\text{CA}$ (bank 2)

Integration time: 25s


Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P000C "A" CAMSHAFT POSITION SLOW RESPONSE BANK 2

Note:

For the diagnostic procedure, refer to DTC P0021.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0021 "A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to P000A.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P000A "A" CAMSHAFT POSITION SLOW RESPONSE BANK 1.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0010 "A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1


DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

Improper idling

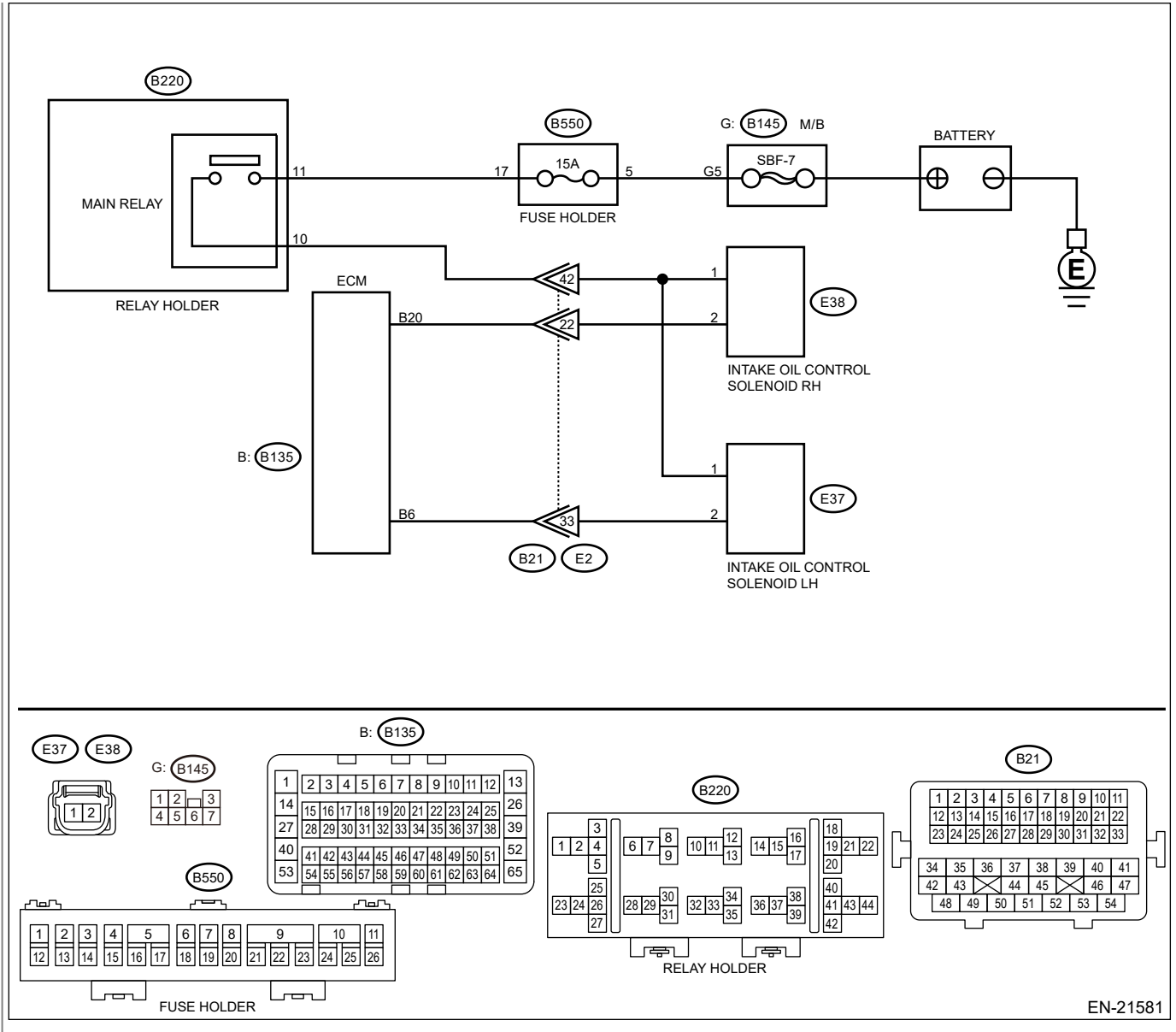
Caution:

- After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode. and Inspection Mode !\[\]\(de0615d88b2098828c20ab3d39ea2ef6_img.jpg\) Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode..](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





EN-21581

1. CHECK OUTPUT SIGNAL OF ECM.



1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B135) No. 20 (+) — Chassis ground (—):

Is the voltage 10 V or more?

Yes

[Go to 2.](#)

No

[Go to 3.](#)

2. CHECK FOR POOR CONTACT.



Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes

Repair the poor contact of ECM connector.

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

3. CHECK POWER SUPPLY TO THE INTAKE OIL CONTROL SOLENOID RH.



Measure the voltage between intake oil control solenoid RH connector and engine ground.

Connector & terminal

(E38) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

Repair the power supply circuit.

4. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the ECM and intake oil control solenoid RH.
3. Measure the resistance between intake oil control solenoid RH connector and engine ground.

Connector & terminal

(E38) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM connector and intake oil control solenoid RH connector.

5. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH CONNECTOR.




Measure the resistance of harness between ECM connector and intake oil control solenoid RH.

Connector & terminal

(B135) No. 20 — (E38) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 6.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and intake oil control solenoid RH connector**
- **Poor contact of coupling connector**

6. CHECK INTAKE OIL CONTROL SOLENOID RH.



Measure the resistance between intake oil control solenoid RH terminals.

Terminals


No. 1 — No. 2:

Is the resistance 6 — 12 Ω ?

Yes

Repair the poor contact of intake oil control solenoid RH connector.

No

Replace the intake oil control solenoid RH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Oil Control Solenoid.](#)

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of the oil control solenoid.

Judge as NG when the current is small even though the duty signal is large.

2. EXECUTION CONDITION

Secondary Parameters	Execution
----------------------	-----------

	condition
Battery voltage	$\geq 10.9 \text{ V}$
Oil control solenoid control duty	$< 99.61\%$

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Oil control solenoid control present current	$< 0.306\text{A}$

Time needed for diagnosis: 2000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0011 "A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

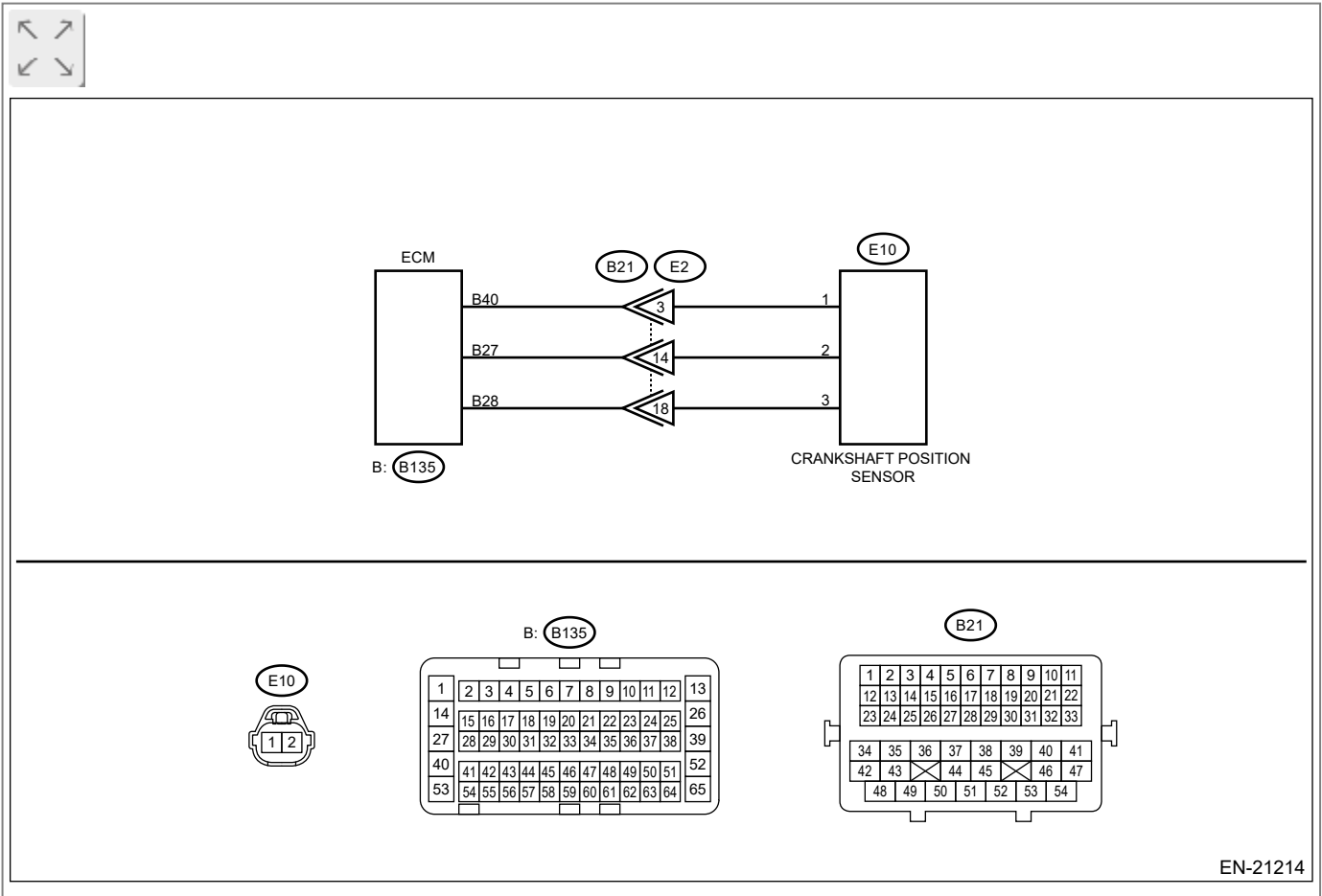
- Engine stalls.
- Improper idling

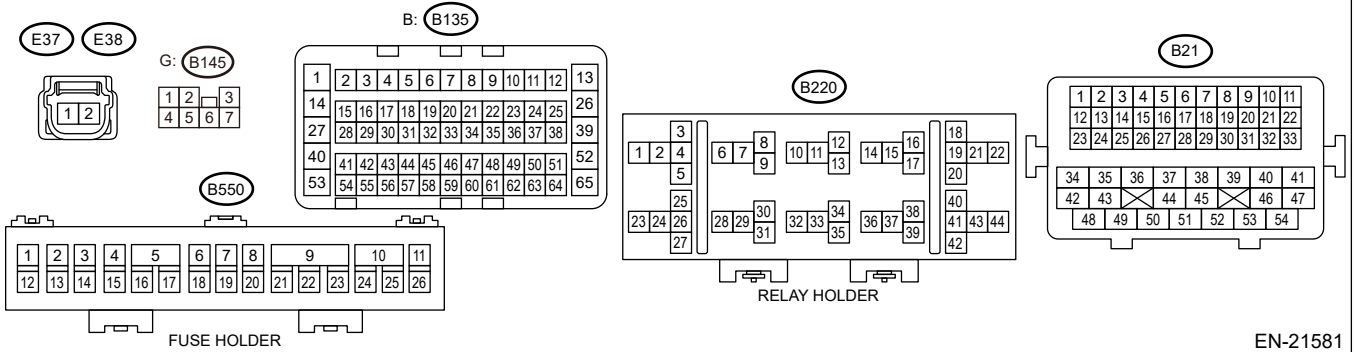
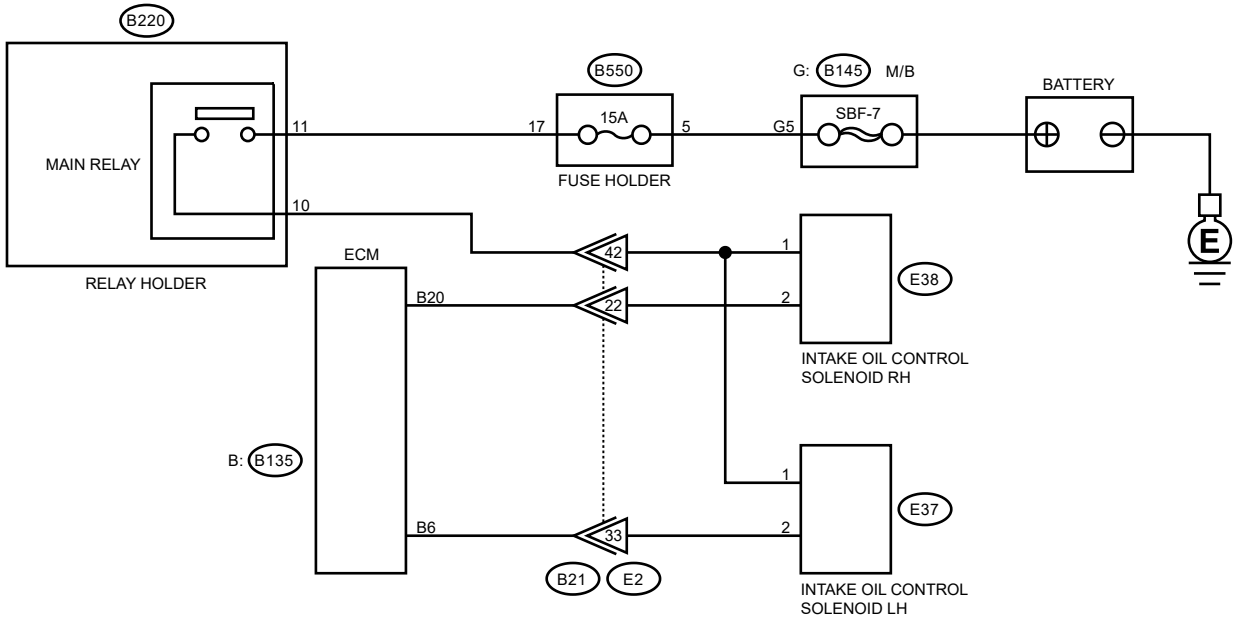
Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE..

WIRING DIAGRAM:

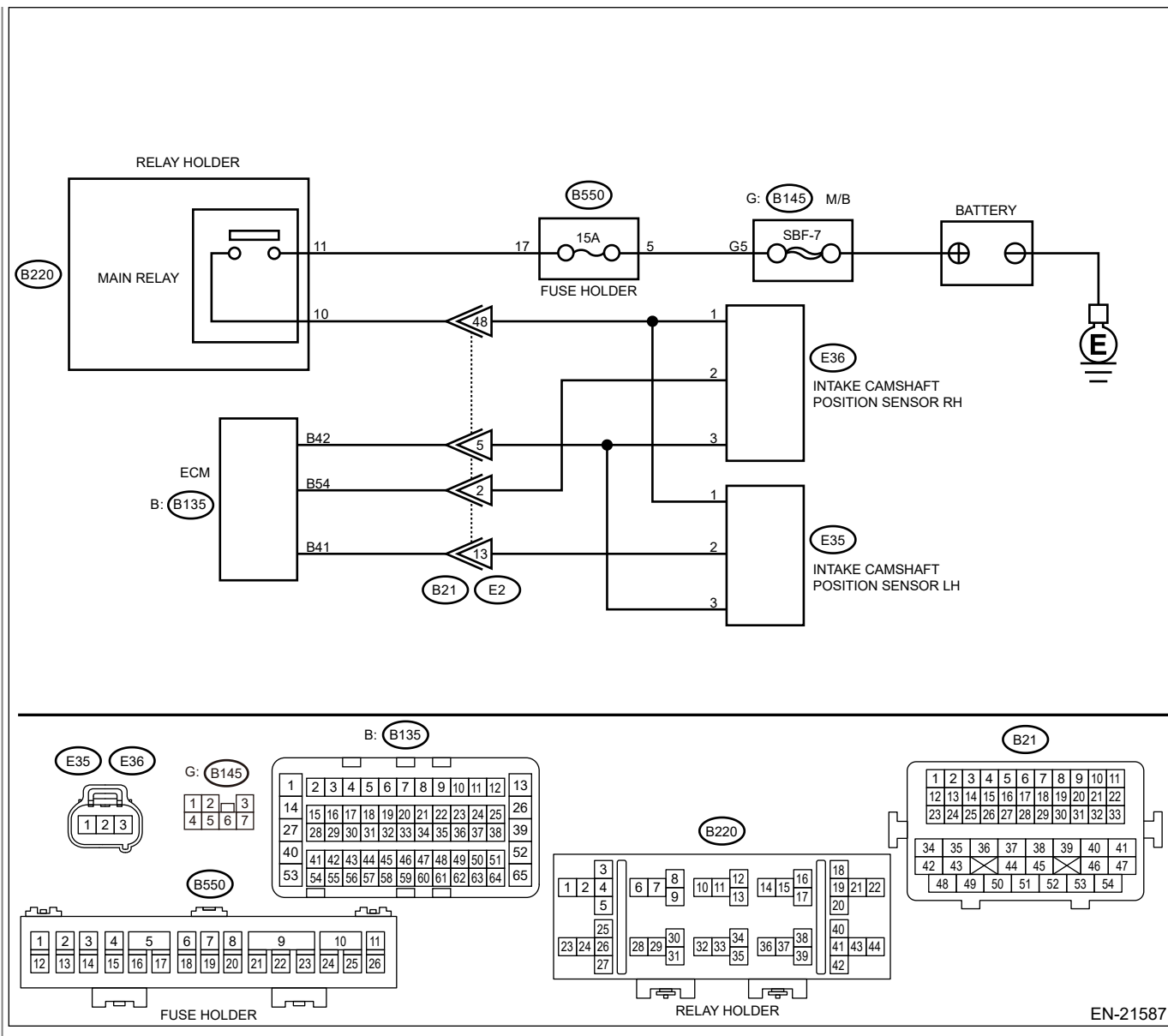
Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





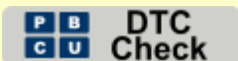
EN-21581





1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)




Is DTC other than P000A and P0011 displayed? (Current malfunction)

Yes

Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)

No

Save the freeze frame data. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

 [Go to 2.](#)

2. CHECK OUTPUT SIGNAL OF ECM.


1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and chassis ground.

Connector & terminal


(B135) No. 20 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 3.](#)

No

 [Go to 4.](#)

3. CHECK FOR POOR CONTACT.

Check the ECM connector and harness.

Note:

Check the following items.

- Poor contact of ECM connector
- Temporary open or short circuit of harness
- Contamination, corrosion or looseness of engine ground terminal

Is the check result OK?

Yes

 [Go to 5.](#)

No

Repair or replace faulty parts.

4. CHECK POWER SUPPLY TO THE INTAKE OIL CONTROL SOLENOID RH.

Measure the voltage between intake oil control solenoid RH connector and engine ground.

Connector & terminal

(E38) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 5.](#)

No

Repair the power supply circuit.

5. CHECK ENGINE OIL CONDITION.

Check the engine oil condition.


Note:

Check the following items.




- **Within the specified range in amount**
- **Excessively dirty**
- **Coagulated by additives**
- **Use of oil of specified viscosity**

Is the check result OK?



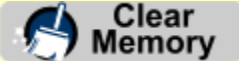


Yes

 [Go to 6.](#)

No

Adjust the oil amount, or replace the engine oil and engine oil filter.  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)
 [Go to 6.](#)

6. CHECK ON-BOARD MONITOR TEST RESULT.

1. Replace the intake oil control solenoid RH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Oil Control Solenoid.](#)
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)

3. Perform drive cycle T.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Drive Cycle.](#)
4. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE\$06.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>General Scan Tool.](#)

Caution:

- **When performing driving cycle, there should be 2 persons (driver and checker) and the checker should perform the data check.**
- **When performing the drive cycle on the public road, be very careful of the traffic condition and the safe driving must be the high priority.**

Note:


- **When the diagnostic value is 0, the diagnosis is incomplete. Therefore, do not stop the engine and perform the drive cycle again.**

- **Always keep on checking the data while reading out the diagnostic value because the diagnostic value is repeatedly updated.**

5. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 1] of the replaced oil control solenoid 1000 or more?

Yes

 [Go to 8.](#)

No

 [Go to 7.](#)

7. CHECK ON-BOARD MONITOR TEST RESULT.




Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 6.

Is the value of [VVT monitor bank 1] 1000 or less, and more than (value of [VVT monitor bank 2] × 1.5 + 100) compared with the value of [VVT monitor bank 2]?

Yes

 [Go to 8.](#)

No





Idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)
 [Go to 17.](#)

8. CHECK HARNESS AND CONNECTOR.

Check for a bend, damage and poor contact of harness and connector.

Note:

Check the following items.






- **ECM**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)
- **Oil control solenoid**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Oil Control Solenoid>INSPECTION.](#)
- **Camshaft position sensor**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Camshaft Position Sensor>INSPECTION.](#)
- **Crankshaft position sensor**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Crankshaft Position Sensor Plate>INSPECTION.](#)

Is the check result OK?

Yes

 [Go to 9.](#)

No

Repair or replace faulty parts.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\)>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Oil Control Solenoid.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Camshaft Position Sensor.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Crankshaft Position Sensor Plate.](#)
 [Go to 9.](#)

9. CHECK HARNESS AND CONNECTOR (OPEN).


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the intake oil control solenoid RH.
4. Measure the resistance between intake oil control solenoid RH connector and ECM connector.

Connector & terminal


(B135) No. 20 — (E38) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 10.](#)

No

Repair or replace faulty parts.
 [Go to 17.](#)

10. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the intake camshaft position sensor RH.
4. Measure the resistance between the intake camshaft position sensor RH connector and ECM connector.

Connector & terminal


(B135) No. 54 — (E36) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 11.](#)

No

Repair or replace faulty parts.
 [Go to 17.](#)

11. CHECK HARNESS AND CONNECTOR (OPEN).



1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the crankshaft position sensor.
4. Measure the resistance between the crankshaft position sensor connector and ECM connector.

Connector & terminal

(B135) No. 40 — (E10) No. 1:

Is the resistance less than 1 Ω ?

Yes

[Go to 12.](#)

No

Repair or replace faulty parts.

[Go to 17.](#)

12. CHECK ENGINE OIL PRESSURE.



Check the engine oil pressure. [Ref. to MECHANICAL\(H4DO\)>Engine Oil Pressure>INSPECTION.](#)

Is the oil pressure of engine oil normal?

Yes

[Go to 14.](#)

No

[Go to 13.](#)

13. CHECK OIL STRAINER.



Check the oil strainer. [Ref. to LUBRICATION\(H4DO\)>Oil Pan>INSPECTION.](#)

Does any foreign matter exist at the oil strainer in the oil pan?

Yes

Check and clean inside the oil strainer.

[Go to 14.](#)


No

Replace the chain cover. [Ref. to MECHANICAL\(H4DO\)>Chain Cover.](#)



Caution:

Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an

appropriate amount (line diameter) of application.  [Ref. to MECHANICAL\(H4DO\)>Cam Carrier>ASSEMBLY.](#)

 [Go to 15.](#)

14. CHECK OIL PATH OF CHAIN COVER.


1. Remove the engine from the vehicle.  [Ref. to MECHANICAL\(H4DO\)>Engine Assembly>REMOVAL.](#)
2. Check the oil path of the chain cover.  [Ref. to MECHANICAL\(H4DO\)>Chain Cover>INSPECTION.](#)

Note:

Check the O-rings in the following oil path and also check that no foreign matter exists.


- Inlet of oil pump
- Outlet of oil pump
- Each O-ring in the path leading to left/right cylinder head
- Oil control solenoid
- Foreign matter exists

Is the check result OK?


 [Go to 15.](#)

Replace faulty parts. If there is any foreign matter, replace the chain cover.

 [Ref. to MECHANICAL\(H4DO\)>Chain Cover.](#)

 [Go to 15.](#)

15. CHECK THE CAMSHAFT CONDITION.

1. Remove the timing chain.  [Ref. to MECHANICAL\(H4DO\)>Timing Chain Assembly>REMOVAL.](#)
2. Rotate the camshaft by hand to compare the rotational resistance of the four.


Note:

Check the following items if there is a clearly faulty condition in the camshaft (bank 1) such as restriction or rotational resistance by comparing it with the rotational resistance of the camshaft (bank 2).




- Foreign matter attached to camshaft
- Damage of camshaft (scratching, galling, wear, etc.)
- Check for consequence from improper rotation of cam journal bearing

Is the check result OK?

Yes

 [Go to 16.](#)

No


Replace the cam carrier and camshaft.  [Ref. to MECHANICAL\(H4DO\)>Cam Carrier.](#)  [Ref. to MECHANICAL\(H4DO\)>Camshaft.](#)
 [Go to 16.](#)

16. CHECK OIL PASSAGE BETWEEN OIL PUMP AND OIL CONTROL SOLENOID.

Visually check the following parts of the oil passage from the oil pump to the oil control solenoid to check obvious defectiveness such as foreign matter, clogging, etc.

- Oil passage in cam Carrier
- Oil passage on cylinder head side
- Oil passage at the joint between cam sprocket and camshaft
- Oil passage at the back of sprocket and the end of camshaft when the sprocket is removed

Note:



[Refer to removal procedure of cam carrier in service manual.](#)  [Ref. to MECHANICAL\(H4DO\)>Cam Carrier>REMOVAL.](#)


Is the check result OK?

Yes


Replace the sprocket.  [Ref. to MECHANICAL\(H4DO\)>Cam Sprocket.](#)

Caution:



- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.**  [Ref. to MECHANICAL\(H4DO\)>Chain Cover>INSTALLATION.](#)
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DO\)>Cam Carrier>ASSEMBLY.](#)

 [Go to 17.](#)



No


Remove the foreign matter. Replace the cam carrier oil filter (reuse not allowed).  [Ref. to MECHANICAL\(H4DO\)>Cam Carrier.](#)

Caution:


- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.**  [Ref. to MECHANICAL\(H4DO\)>Chain Cover>INSTALLATION.](#)
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DO\)>Cam Carrier>ASSEMBLY.](#)

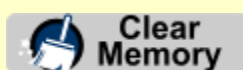
Note:



After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)

 [Go to 17.](#)

17. CHECK ON-BOARD MONITOR TEST RESULT.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)



2. Perform drive cycle T.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Drive Cycle.](#)
3. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE\$06.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>General Scan Tool.](#)

Caution:

- When performing driving cycle, there should be 2 persons (driver and checker) and the checker should perform the data check.
- When performing the drive cycle on the public road, be very careful of the traffic condition and the safe driving must be the high priority.


Note:

- When the diagnostic value is 0, the diagnosis is incomplete. Therefore, do not stop the engine and perform the drive cycle again.
- Keep on checking the data during drive cycle because the diagnostic value is repeatedly updated.


4. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 1] 1000 or more?

Yes

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)

No


 [Go to 18.](#)

18. CHECK DTC.

Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 17.

Is the value of [VVT monitor bank 1] 1000 or less, and more than (value of [VVT monitor bank 2] $\times 1.5 + 100$) compared with the value of [VVT monitor bank 2]?

Yes

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Engine Control Module \(ECM\).](#)

No

End.

1. OUTLINE OF DIAGNOSIS

Detect the AVCS system malfunction.

Judge as NG when the conditions during which the differences of AVCS target timing advance amount and AVCS actual timing advance amount is large continues.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
AVCS control	In operation

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

When the conditions during which the differences of AVCS target timing advance amount and AVCS actual timing advance amount is large continues for certain amount of time.

Judge as NG when the following conditions are established within the predetermined time.

Judgment value

Malfunction Criteria	Threshold Value
(Target position – Actual position)	> 10°CA

Time needed for diagnosis:5000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0016 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR A



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

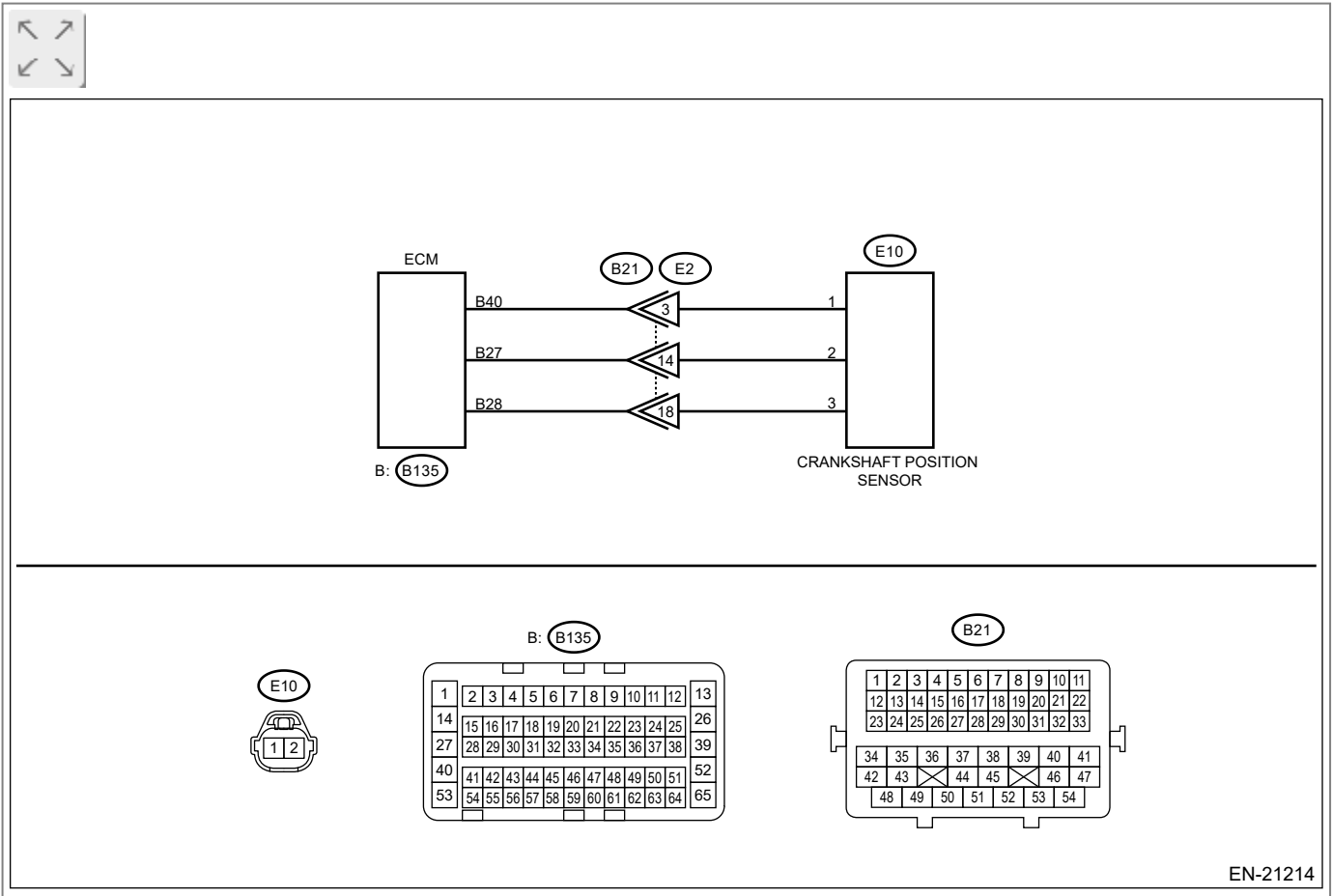
- Engine stalls.
- Improper idling

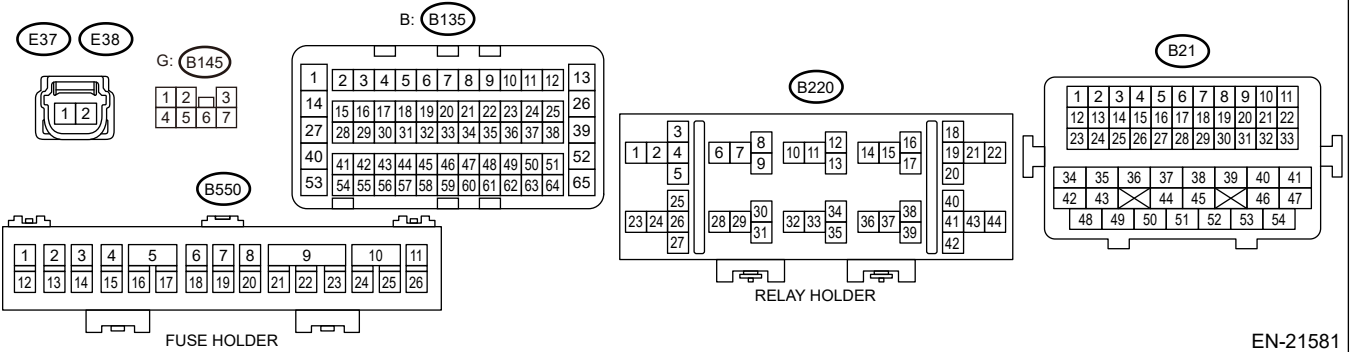
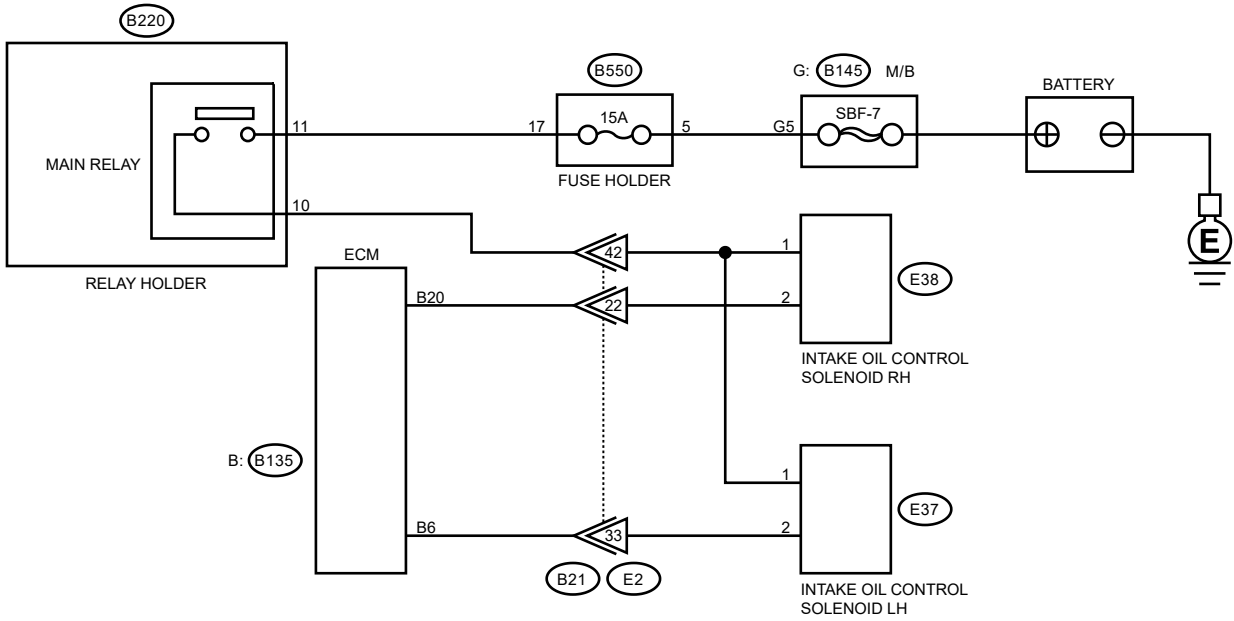
Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE..

WIRING DIAGRAM:

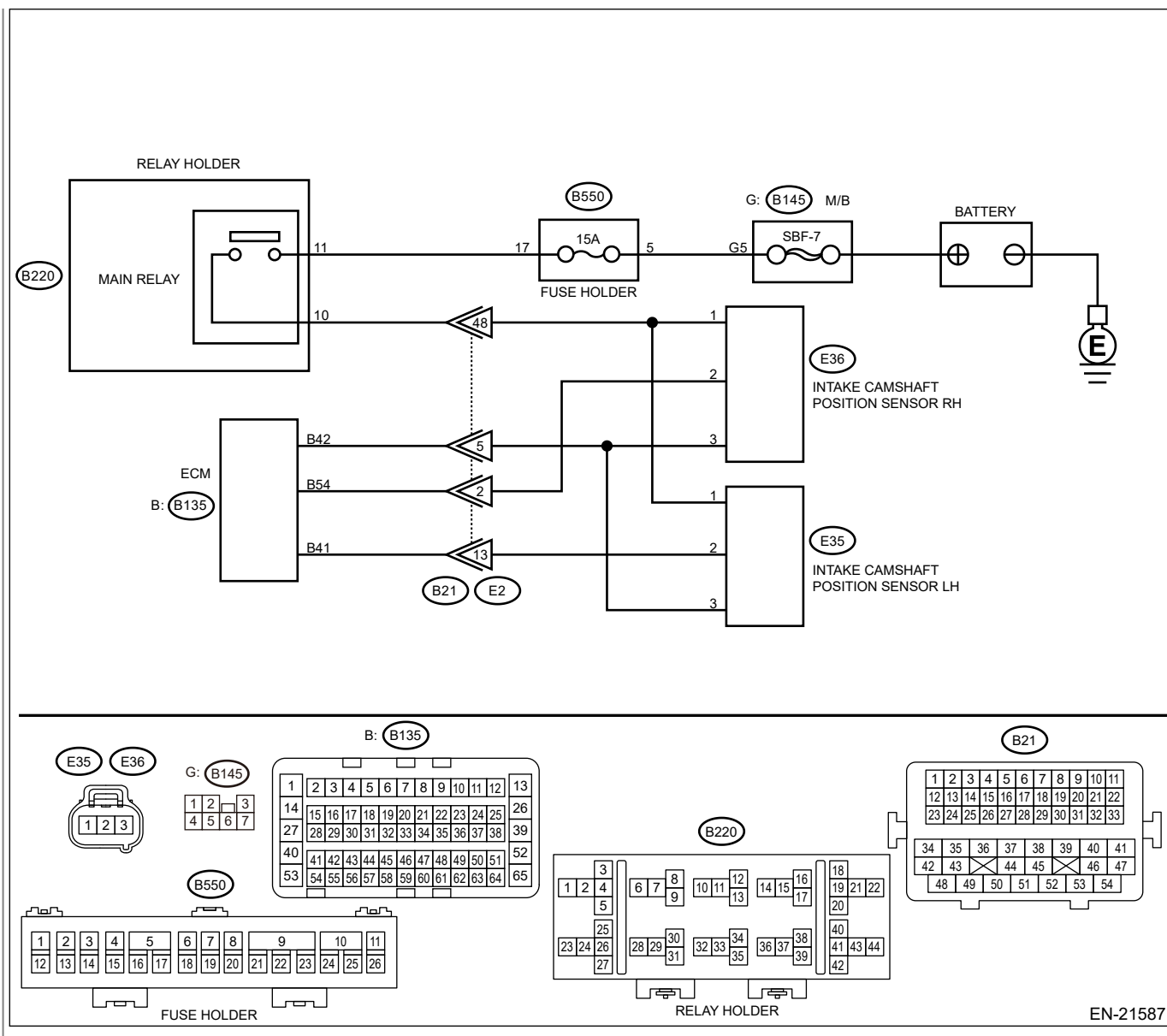
Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





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1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)



Is DTC other than P0016 displayed? (Current malfunction)

Yes

Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)

No

Save the freeze frame data. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

 [Go to 2.](#)

2. CHECK ENGINE OIL CONDITION.

Check the engine oil condition.


Note:

Check the following items.



- **Within the specified range in amount**
- **Excessively dirty**
- **Coagulated by additives**
- **Use of oil of specified viscosity**

Is the check result OK?

Yes


 [Go to 3.](#)

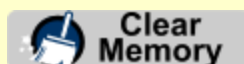
No

Adjust the oil amount, or replace the engine oil and engine oil filter.  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)

 [Go to 3.](#)

3. CHECK TIMING CHAIN.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)



2. Turn the ignition switch to OFF.
3. Disconnect the connector of the intake oil control solenoid RH. (DTC will be set but this will not affect the inspection)
4. Turn the ignition switch to ON.
5. Start monitoring [VVT Adv. Ang. Amount R] on the data monitor.
6. Start the engine.
7. Read [VVT Adv. Ang. Amount R] within 10 seconds after engine is started.


Note:


The display will indicate [0] by judging the position as standard after 10 seconds elapse since the engine was started.

8. Record the readings [VVT Adv. Ang. Amount R].
9. Stop the engine.


Is [VVT Adv. Ang. Amount R] out of standard (0 deg) by ± 10 deg or more within 10 seconds after starting?

Yes



Repair the timing chain.  [Ref. to MECHANICAL\(H4DO\)>Timing Chain Assembly.](#)

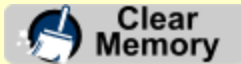
 [Go to 15.](#)



No

 [Go to 4.](#)

4. CHECK ON-BOARD MONITOR TEST RESULT.

1. Replace the intake oil control solenoid RH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Oil Control Solenoid.](#)
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)



3. Perform drive cycle T.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Drive Cycle.](#)
4. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE\$06.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>General Scan Tool.](#)

Caution:

- **When performing driving cycle, there should be 2 persons (driver and checker) and the checker should perform the data check.**
- **When performing the drive cycle on the public road, be very careful of the traffic condition and the safe driving must be the high priority.**

Note:

- **When the diagnostic value is 0, the diagnosis is incomplete. Therefore, do not stop the engine and perform the drive cycle again.**
- **Keep on checking the data during drive cycle because the diagnostic value is repeatedly updated.**

5. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 1] of the replaced oil control solenoid 1000 or more?

Yes

 [Go to 6.](#)

No


 [Go to 5.](#)

5. CHECK ON-BOARD MONITOR TEST RESULT.




Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 4.

Is the value of [VVT monitor bank 1] 1000 or less, and more than (value of [VVT monitor bank 2] ×1.5+ 100) compared with the value of [VVT monitor bank 2]?

Yes

 [Go to 6.](#)

No





Idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)
 [Go to 15.](#)

6. CHECK HARNESS AND CONNECTOR.

Check for a bend, damage and poor contact of harness and connector.

Note:

Check the following items.






- **ECM**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)
- **Oil control solenoid**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Oil Control Solenoid>INSPECTION.](#)
- **Camshaft position sensor**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Camshaft Position Sensor>INSPECTION.](#)
- **Crankshaft position sensor**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Crankshaft Position Sensor Plate>INSPECTION.](#)

Is the check result OK?

Yes

 [Go to 7.](#)

No

Repair or replace faulty parts.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Engine Control Module \(ECM\)>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Oil Control Solenoid.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Camshaft Position Sensor.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Crankshaft Position Sensor Plate.](#)
 [Go to 7.](#)

7. CHECK HARNESS AND CONNECTOR (OPEN).


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the intake oil control solenoid RH.
4. Measure the resistance between intake oil control solenoid RH connector and ECM connector.

Connector & terminal

(B135) No. 20 — (E38) No. 2:


Is the resistance less than 1 Ω ?

Yes

 [Go to 8.](#)

No

Repair or replace faulty parts.

 [Go to 15.](#)

8. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the intake camshaft position sensor RH.
4. Measure the resistance between the intake camshaft position sensor RH connector and ECM connector.

Connector & terminal

(B135) No. 54 — (E36) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 9.](#)

No

Repair or replace faulty parts.

 [Go to 15.](#)

9. CHECK HARNESS AND CONNECTOR (OPEN).


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the crankshaft position sensor.
4. Measure the resistance between the crankshaft position sensor connector and ECM connector.

Connector & terminal

(B135) No. 40 — (E10) No. 1:


Is the resistance less than 1 Ω ?

Yes


 [Go to 10.](#)

No

Repair or replace faulty parts.

 [Go to 15.](#)

10. CHECK ENGINE OIL PRESSURE.


Check the engine oil pressure.  [Ref. to MECHANICAL\(H4DO\)>Engine Oil Pressure>INSPECTION.](#)

Is the oil pressure of engine oil normal?

Yes

 [Go to 12.](#)

No

 [Go to 11.](#)

11. CHECK OIL STRAINER.

Check the oil strainer.  [Ref. to LUBRICATION\(H4DO\)>Oil Pan>INSPECTION.](#)


Does any foreign matter exist at the oil strainer in the oil pan?

Yes


Check and clean inside the oil strainer.


 [Go to 12.](#)

No



Replace the chain cover.  [Ref. to MECHANICAL\(H4DO\)>Chain Cover.](#)

Caution:

Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.  [Ref. to MECHANICAL\(H4DO\)>Chain Cover>INSTALLATION.](#)

 [Go to 13.](#)

12. CHECK OIL PATH OF CHAIN COVER.

1. Remove the engine from the vehicle.  [Ref. to MECHANICAL\(H4DO\)>Engine Assembly>REMOVAL.](#)
2. Check the oil path of the chain cover.  [Ref. to MECHANICAL\(H4DO\)>Chain Cover>INSPECTION.](#)

Note:


Check the O-rings in the following oil path and also check that no foreign matter exists.

- Inlet of oil pump
- Outlet of oil pump

- Each O-ring in the path leading to left/right cylinder head
- Oil control solenoid
- Foreign matter exists

Is the check result OK?


Yes

 [Go to 13.](#)


No

Replace faulty parts. If there is any foreign matter, replace the chain cover.

 [Ref. to MECHANICAL\(H4DO\)>Chain Cover.](#)

 [Go to 13.](#)

13. CHECK THE CAMSHAFT CONDITION.

1. Remove the timing chain.  [Ref. to MECHANICAL\(H4DO\)>Timing Chain Assembly>REMOVAL.](#)
2. Rotate the camshaft by hand to compare the rotational resistance of the four.


Note:

Check the following items if there is a clearly faulty condition in the camshaft (bank 1) such as restriction or rotational resistance by comparing it with the rotational resistance of the camshaft (bank 2).



- Foreign matter attached to camshaft
- Damage of camshaft (scratching, galling, wear, etc.)
- Check for consequence from improper rotation of cam journal bearing


Is the check result OK?

Yes

 [Go to 14.](#)

No

Replace the cam carrier and camshaft.  [Ref. to MECHANICAL\(H4DO\)>Cam Carrier.](#)  [Ref. to MECHANICAL\(H4DO\)>Camshaft.](#)

 [Go to 14.](#)


14. CHECK OIL PASSAGE FROM OIL PUMP TO OIL CONTROL SOLENOID.

Visually check the following parts of the oil passage from the oil pump to the oil control solenoid to check obvious defectiveness such as foreign matter, clogging, etc.

- Oil passage in cam Carrier
- Oil passage on cylinder head side
- Oil passage at the joint between cam sprocket and camshaft

- Oil passage at the back of sprocket and the end of camshaft when the sprocket is removed

Note:



Refer to removal procedure of cam carrier in service manual.  [Ref. to MECHANICAL\(H4DO\)>Cam Carrier>REMOVAL.](#)


Is the check result OK?

Yes


Replace the sprocket.  [Ref. to MECHANICAL\(H4DO\)>Cam Sprocket.](#)

Caution:



- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.**  [Ref. to MECHANICAL\(H4DO\)>Chain Cover>INSTALLATION.](#)
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DO\)>Cam Carrier>ASSEMBLY.](#)

 [Go to 15.](#)



No

Remove the foreign matter. Replace the cam carrier oil filter (reuse not allowed).  [Ref. to MECHANICAL\(H4DO\)>Cam Carrier.](#)

Caution:

- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.**  [Ref. to MECHANICAL\(H4DO\)>Chain Cover>INSTALLATION.](#)
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DO\)>Cam Carrier>ASSEMBLY.](#)


Note:

After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)

 [Go to 15.](#)

15. CHECK CURRENT DATA (LEARNING VALUE ERROR).



1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)



3. Using the Subaru Select Monitor, read the data monitor. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
4. Read the current value of [VVT Initial Position Learning Value #1].
5. Find the sum value of read [VVT Initial Position Learning Value #1] and [VVT Adv. Ang. Amount R] recorded in step 3.

Is the sum value within standard?

Standard:

45 – 74

Yes

ECM is good; finish the diagnosis.

No

Replace the ECM and perform drive cycle N. When DTC is not displayed, end the diagnosis. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)

1. OUTLINE OF DIAGNOSIS

Detect the AVCS system malfunction.

Judge as NG when standard timing advance amount is far from learning angle.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Elapsed time after external load (power steering, neutral position switch) change	≥ 3000ms
AVCS learning	In operation
Actual timing advance change amount (for 8 ms)	< 3.7°CA

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously at idling after warming up engine.

4. DIAGNOSTIC METHOD

Judge as NG when the absolute value of the difference between cam signal input position and learning value is out of specification.

Diagnosis 1

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

--	--

Malfunction Criteria	Threshold Value
Crankshaft position when camshaft position sensor signal is input – Learning value	> 10°CA

Time needed for diagnosis:5000ms

Diagnosis 2

Judgment value

Malfunction Criteria	Threshold Value
Camshaft position sensor signal input position (bank 1)	< 0.24°CA or > 58.73°CA
Camshaft position sensor signal input position (bank 2)	< 0.24°CA or > 57.26°CA

Time needed for diagnosis:5000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

Note:

Initial standard learning value is the value of crank angle initially input at the production plant. And then it will be updated every time normal judgment has been completed. Learning value will not be updated if NG judgment occurs because timing belt or chain derails suddenly in process or because wrong assembly occurs during servicing.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0018 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR A



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

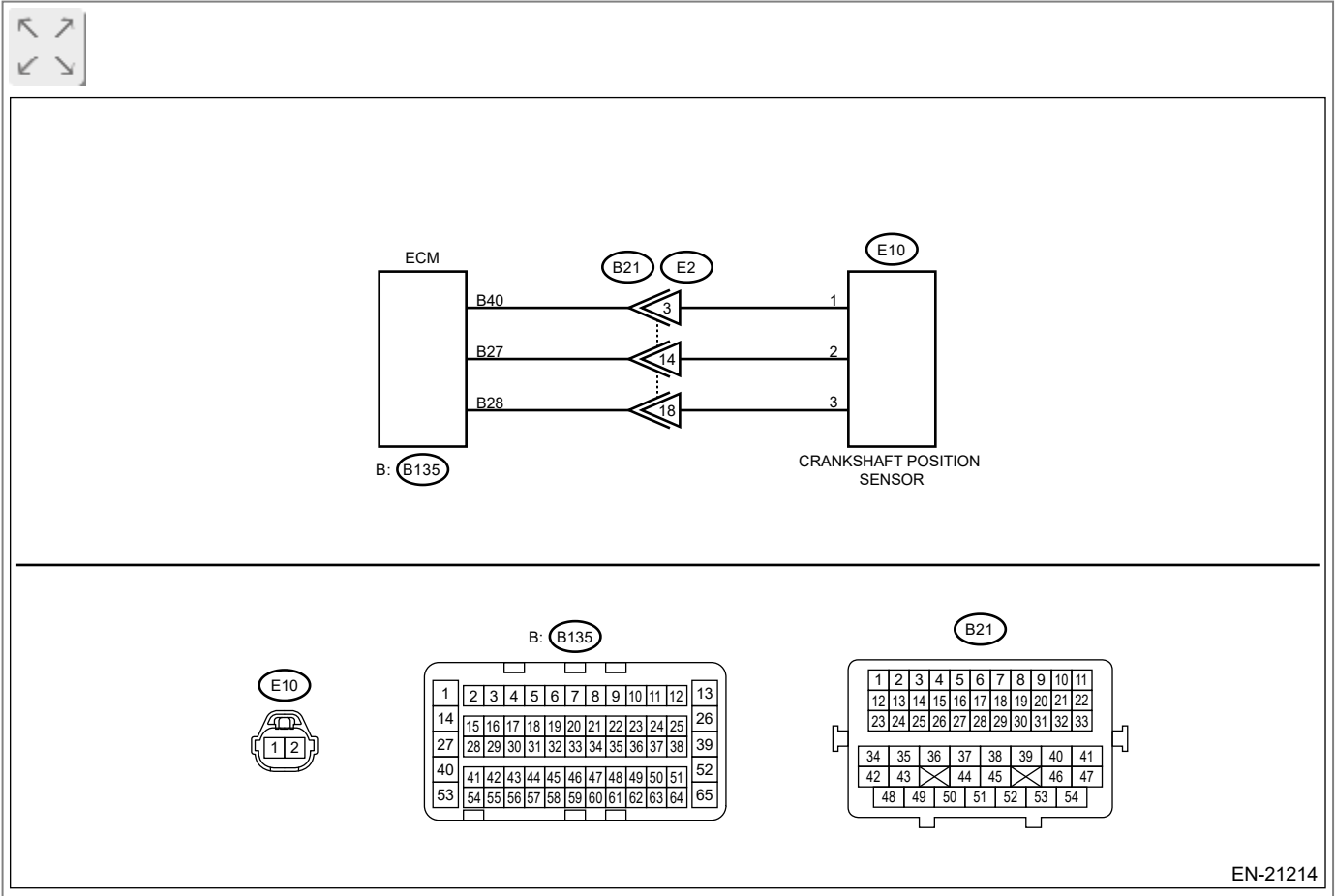
- Engine stalls.
- Improper idling

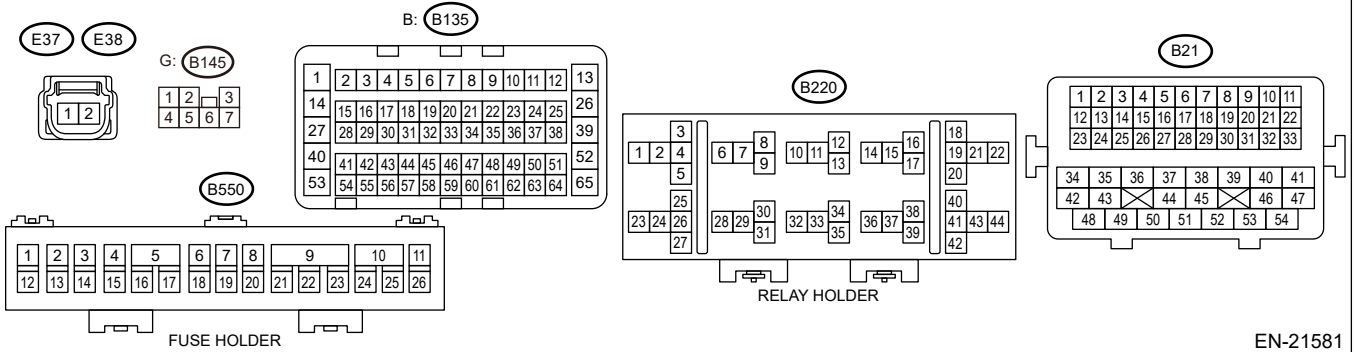
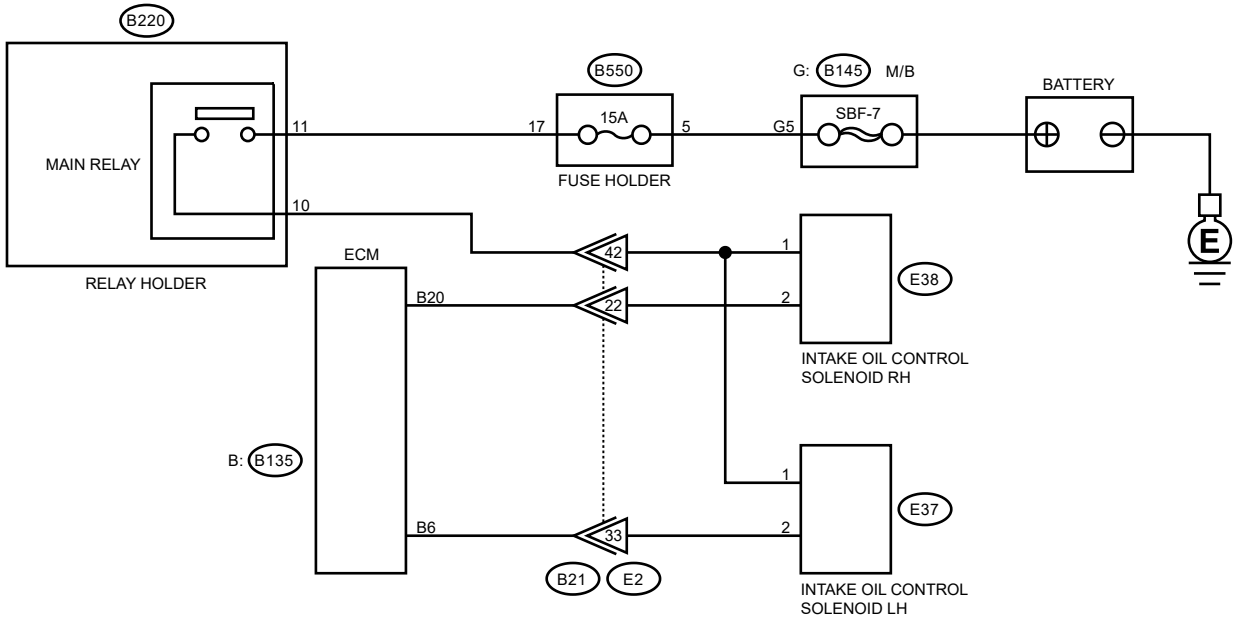
Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE..

WIRING DIAGRAM:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





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 [Go to 2.](#)

2. CHECK ENGINE OIL CONDITION.

Check the engine oil condition.

Note:

Check the following items.



- **Within the specified range in amount**
- **Excessively dirty**
- **Coagulated by additives**
- **Use of oil of specified viscosity**

Is the check result OK?

Yes


 [Go to 3.](#)

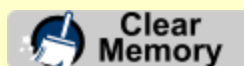
No

Adjust the oil amount, or replace the engine oil and engine oil filter.  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)

 [Go to 3.](#)

3. CHECK TIMING CHAIN.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)



2. Turn the ignition switch to OFF.
3. Disconnect the connector of the intake oil control solenoid LH. (DTC will be set but this will not affect the inspection)
4. Turn the ignition switch to ON.
5. Start monitoring [VVT Adv. Ang. Amount L] on the data monitor.
6. Start the engine.
7. Read [VVT Adv. Ang. Amount L] within 10 seconds after engine is started.


Note:


The display will indicate [0] by judging the position as standard after 10 seconds elapse since the engine was started.

8. Record the readings [VVT Adv. Ang. Amount L].
9. Stop the engine.


Is [VVT Adv. Ang. Amount L] out of standard (0 deg) by ± 10 deg or more within 10 seconds after starting?

Yes



Repair the timing chain.  [Ref. to MECHANICAL\(H4DO\)>Timing Chain Assembly.](#)

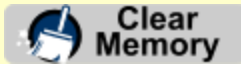
 [Go to 15.](#)



No

 [Go to 4.](#)

4. CHECK ON-BOARD MONITOR TEST RESULT.

1. Replace the intake oil control solenoid LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Oil Control Solenoid.](#)
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)



3. Perform drive cycle T.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Drive Cycle.](#)
4. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE\$06.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>General Scan Tool.](#)

Caution:

- **When performing driving cycle, there should be 2 persons (driver and checker) and the checker should perform the data check.**
- **When performing the drive cycle on the public road, be very careful of the traffic condition and the safe driving must be the high priority.**

Note:

- **When the diagnostic value is 0, the diagnosis is incomplete. Therefore, do not stop the engine and perform the drive cycle again.**
- **Keep on checking the data during drive cycle because the diagnostic value is repeatedly updated.**

5. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 2] of the replaced oil control solenoid 1000 or more?

Yes

 [Go to 6.](#)

No


 [Go to 5.](#)

5. CHECK ON-BOARD MONITOR TEST RESULT.




Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 4.

Is the value of [VVT monitor bank 2] 1000 or less, and more than (value of [VVT monitor bank 1] ×1.5+ 100) compared with the value of [VVT monitor bank 1]?

Yes

 [Go to 6.](#)

No





Idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)
 [Go to 15.](#)

6. CHECK HARNESS AND CONNECTOR.

Check for a bend, damage and poor contact of harness and connector.

Note:

Check the following items.






- **ECM**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)
- **Oil control solenoid**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Oil Control Solenoid>INSPECTION.](#)
- **Camshaft position sensor**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Camshaft Position Sensor>INSPECTION.](#)
- **Crankshaft position sensor**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Crankshaft Position Sensor Plate>INSPECTION.](#)

Is the check result OK?

Yes

 [Go to 7.](#)

No

Repair or replace faulty parts.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Engine Control Module \(ECM\)>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Oil Control Solenoid.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Camshaft Position Sensor.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Crankshaft Position Sensor Plate.](#)
 [Go to 7.](#)

7. CHECK HARNESS AND CONNECTOR (OPEN).


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the intake oil control solenoid LH.
4. Measure the resistance between intake oil control solenoid LH connector and ECM connector.

Connector & terminal

(B135) No. 6 — (E37) No. 2:


Is the resistance less than 1 Ω ?

Yes

 [Go to 8.](#)

No

Repair or replace faulty parts.

 [Go to 15.](#)

8. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from intake camshaft position sensor LH.
4. Measure the resistance between the intake camshaft position sensor LH connector and ECM connector.

Connector & terminal

(B135) No. 41 — (E35) No. 2:


Is the resistance less than 1 Ω ?

Yes

 [Go to 9.](#)

No

Repair or replace faulty parts.

 [Go to 15.](#)

9. CHECK HARNESS AND CONNECTOR (OPEN).


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the crankshaft position sensor.
4. Measure the resistance between the crankshaft position sensor connector and ECM connector.

Connector & terminal

(B135) No. 40 — (E10) No. 1:


Is the resistance less than 1 Ω ?

Yes


 [Go to 10.](#)

No

Repair or replace faulty parts.

 [Go to 15.](#)

10. CHECK ENGINE OIL PRESSURE.

Check the engine oil pressure.  [Ref. to MECHANICAL\(H4DO\)>Engine Oil Pressure>INSPECTION.](#)

Is the oil pressure of engine oil normal?

Yes

 [Go to 12.](#)

No

 [Go to 11.](#)

11. CHECK OIL STRAINER.

Check the oil strainer.  [Ref. to LUBRICATION\(H4DO\)>Oil Pan>INSPECTION.](#)


Does any foreign matter exist at the oil strainer in the oil pan?

Yes


Check and clean inside the oil strainer.


 [Go to 12.](#)

No



Replace the chain cover.  [Ref. to MECHANICAL\(H4DO\)>Chain Cover.](#)

Caution:

Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.  [Ref. to MECHANICAL\(H4DO\)>Chain Cover>INSTALLATION.](#)

 [Go to 13.](#)

12. CHECK OIL PATH OF CHAIN COVER.

1. Remove the engine from the vehicle.  [Ref. to MECHANICAL\(H4DO\)>Engine Assembly>REMOVAL.](#)
2. Check the oil path of the chain cover.  [Ref. to MECHANICAL\(H4DO\)>Chain Cover>INSPECTION.](#)

Note:


Check the O-rings in the following oil path and also check that no foreign matter exists.

- Inlet of oil pump
- Outlet of oil pump

- Each O-ring in the path leading to left/right cylinder head
- Oil control solenoid
- Foreign matter exists

Is the check result OK?


Yes

 [Go to 13.](#)


No

Replace faulty parts. If there is any foreign matter, replace the chain cover.

 [Ref. to MECHANICAL\(H4DO\)>Chain Cover.](#)

 [Go to 13.](#)

13. CHECK THE CAMSHAFT CONDITION.

1. Remove the timing chain.  [Ref. to MECHANICAL\(H4DO\)>Timing Chain Assembly>REMOVAL.](#)
2. Rotate the camshaft by hand to compare the rotational resistance of the four.


Note:

Check the following items if there is a clearly faulty condition in the camshaft (bank 2) such as restriction or rotational resistance by comparing it with the rotational resistance of the camshaft (bank 1).



- Foreign matter attached to camshaft
- Damage of camshaft (scratching, galling, wear, etc.)
- Check for consequence from improper rotation of cam journal bearing


Is the check result OK?

Yes

 [Go to 14.](#)

No

Replace the cam carrier and camshaft.  [Ref. to MECHANICAL\(H4DO\)>Cam Carrier.](#)  [Ref. to MECHANICAL\(H4DO\)>Camshaft.](#)

 [Go to 14.](#)


14. CHECK OIL PASSAGE FROM OIL PUMP TO OIL CONTROL SOLENOID.

Visually check the following parts of the oil passage from the oil pump to the oil control solenoid to check obvious defectiveness such as foreign matter, clogging, etc.

- Oil passage in cam Carrier
- Oil passage on cylinder head side
- Oil passage at the joint between cam sprocket and camshaft

- Oil passage at the back of sprocket and the end of camshaft when the sprocket is removed

Note:



Refer to removal procedure of cam carrier in service manual.  [Ref. to MECHANICAL\(H4DO\)>Cam Carrier>REMOVAL.](#)


Is the check result OK?

Yes


Replace the sprocket.  [Ref. to MECHANICAL\(H4DO\)>Cam Sprocket.](#)

Caution:



- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.**  [Ref. to MECHANICAL\(H4DO\)>Chain Cover>INSTALLATION.](#)
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DO\)>Cam Carrier>ASSEMBLY.](#)

 [Go to 15.](#)



No

Remove the foreign matter. Replace the cam carrier oil filter (reuse not allowed).  [Ref. to MECHANICAL\(H4DO\)>Cam Carrier.](#)

Caution:

- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.**  [Ref. to MECHANICAL\(H4DO\)>Chain Cover>INSTALLATION.](#)
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DO\)>Cam Carrier>ASSEMBLY.](#)


Note:

After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)


 [Go to 15.](#)

15. CHECK CURRENT DATA (LEARNING VALUE ERROR).



1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)



3. Using the Subaru Select Monitor, read the data monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
4. Read the current value of [VVT Initial Position Learning Value #2].
5. Find the sum value of read [VVT Initial Position Learning Value #2] and [VVT Adv. Ang. Amount L] recorded in step 3.

Is the sum value within standard?


Standard:

45 – 74

Yes

ECM is good; finish the diagnosis.

No

Replace the ECM and perform drive cycle N. When DTC is not displayed, end the diagnosis.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0016.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0016 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR A.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0020 "A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

Improper idling

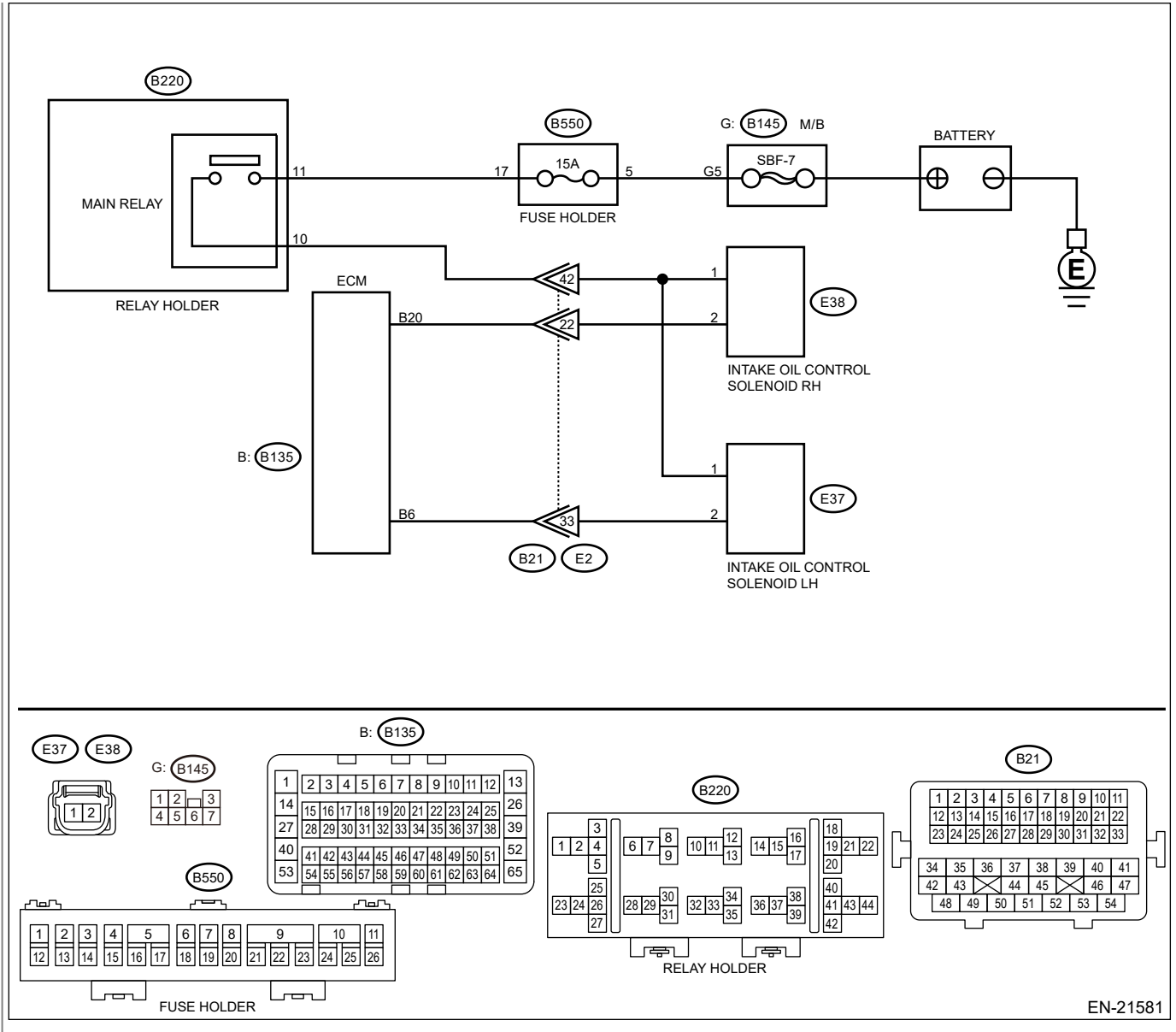
Caution:

- After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode](#) and Inspection Mode  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





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1. CHECK OUTPUT SIGNAL OF ECM.



1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B135) No. 6 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

[Go to 2.](#)

No

[Go to 3.](#)

2. CHECK FOR POOR CONTACT.



Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes

Repair the poor contact of ECM connector.

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

3. CHECK POWER SUPPLY TO THE INTAKE OIL CONTROL SOLENOID LH.



Measure the voltage between intake oil control solenoid LH connector and engine ground.

Connector & terminal

(E37) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

Repair the power supply circuit.

4. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake oil control solenoid LH.
3. Disconnect the connector from ECM.
4. Measure the resistance between intake oil control solenoid LH connector and engine ground.

Connector & terminal

(E37) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM connector and intake oil control solenoid LH connector.

5. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH CONNECTOR.




Measure the resistance of harness between ECM connector and intake oil control solenoid LH.

Connector & terminal

(B135) No. 6 — (E37) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 6.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and intake oil control solenoid LH connector**
- **Poor contact of coupling connector**

6. CHECK INTAKE OIL CONTROL SOLENOID LH.



Measure the resistance between intake oil control solenoid LH terminals.

Terminals


No. 1 —No. 2:

Is the resistance 6 — 12 Ω ?

Yes

Repair the poor contact of intake oil control solenoid LH connector.

No

Replace the intake oil control solenoid LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Oil Control Solenoid.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0010.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0010 "A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0021 "A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

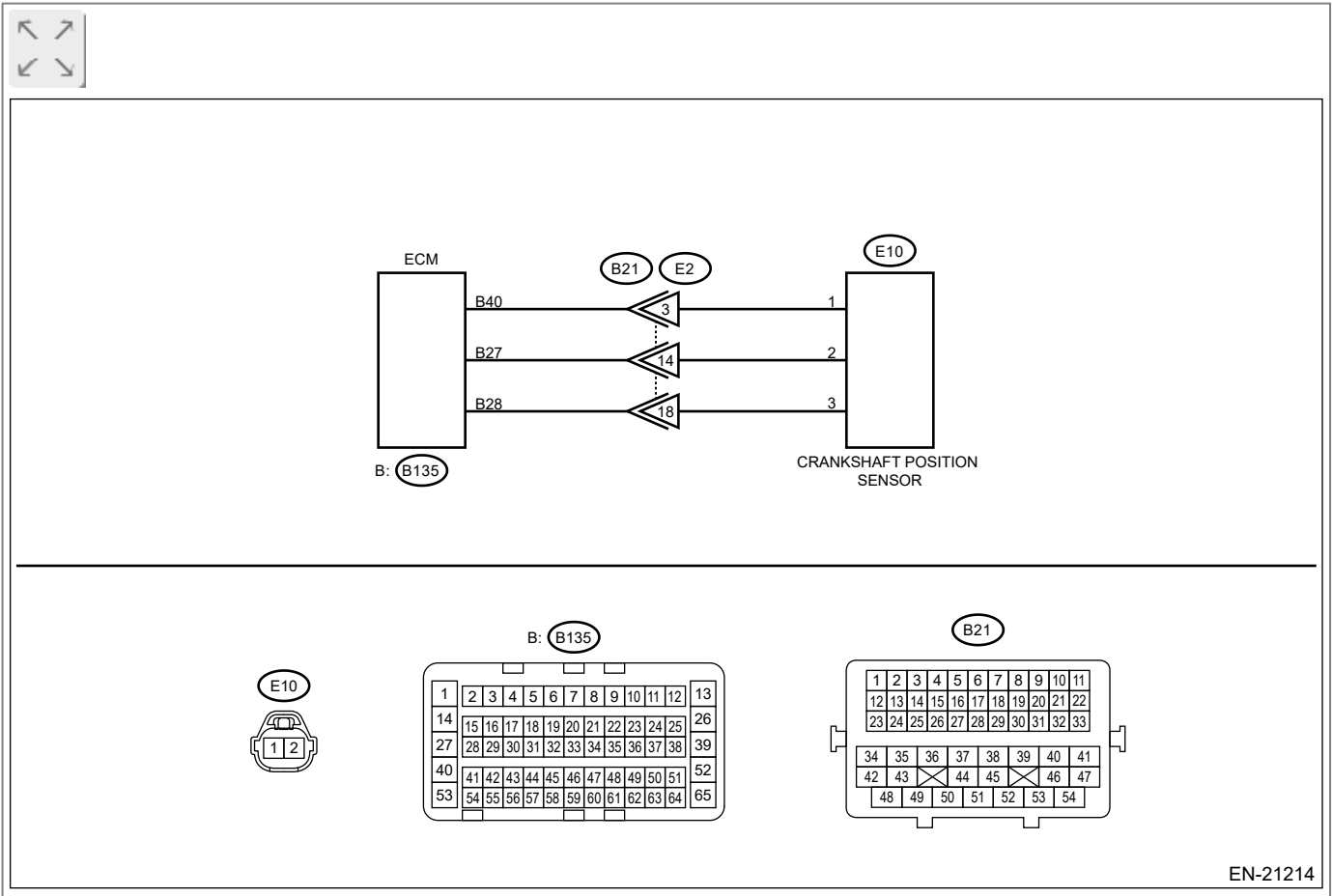
- Engine stalls.
- Improper idling

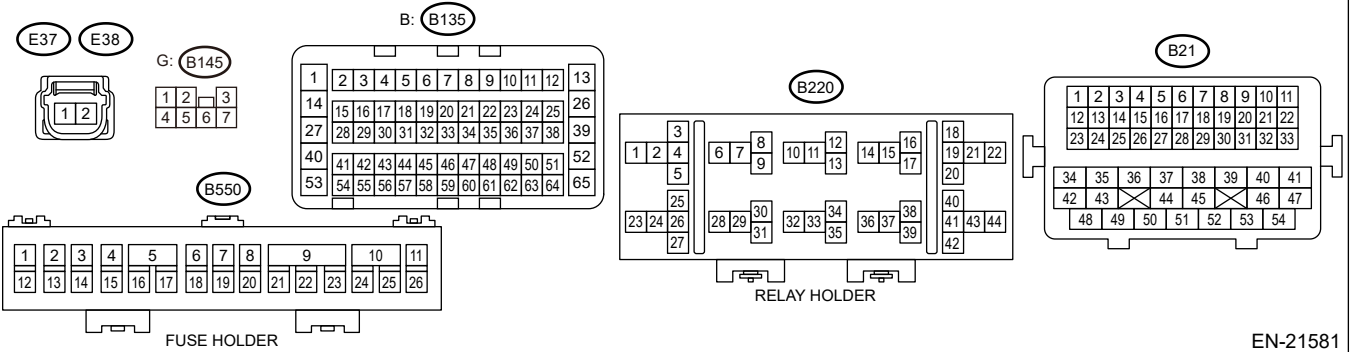
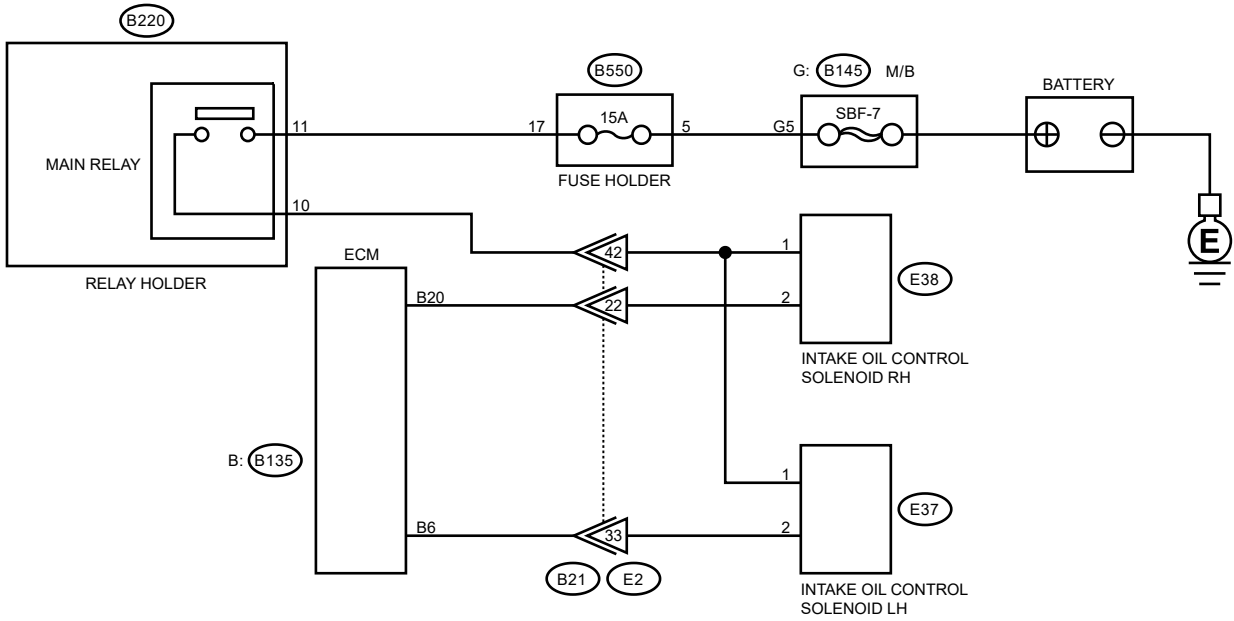
Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE..

WIRING DIAGRAM:

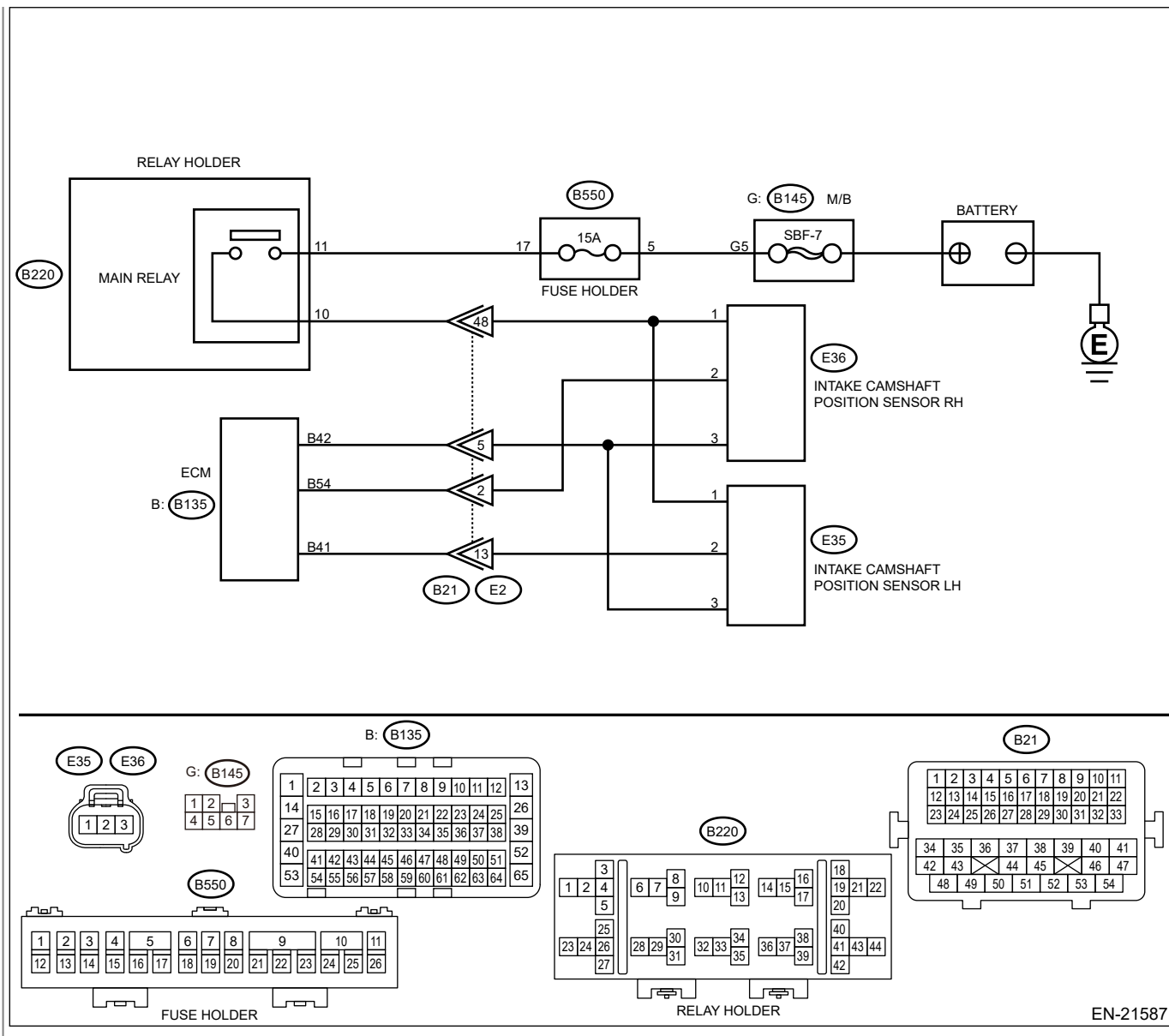
Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





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1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)




Is DTC other than P000C and P0021 displayed? (Current malfunction)

Yes

Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)

No

Save the freeze frame data. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

 [Go to 2.](#)

2. CHECK OUTPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and chassis ground.

Connector & terminal


(B135) No. 6 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 3.](#)

No

 [Go to 4.](#)

3. CHECK FOR POOR CONTACT.

Check the ECM connector and harness.

Note:

Check the following items.

- Poor contact of ECM connector
- Temporary open or short circuit of harness
- Contamination, corrosion or looseness of engine ground terminal

Is the check result OK?

Yes

 [Go to 5.](#)

No

Repair or replace faulty parts.

4. CHECK POWER SUPPLY TO THE INTAKE OIL CONTROL SOLENOID LH.

Measure the voltage between intake oil control solenoid LH connector and engine ground.

Connector & terminal

(E37) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 5.](#)

No

Repair the power supply circuit.

5. CHECK ENGINE OIL CONDITION.

Check the engine oil condition.


Note:

Check the following items.




- **Within the specified range in amount**
- **Excessively dirty**
- **Coagulated by additives**
- **Use of oil of specified viscosity**

Is the check result OK?



Yes

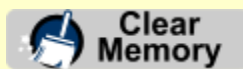
 [Go to 6.](#)



No

Adjust the oil amount, or replace the engine oil and engine oil filter.  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)
 [Go to 6.](#)

6. CHECK ON-BOARD MONITOR TEST RESULT.

1. Replace the intake oil control solenoid LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Oil Control Solenoid.](#)
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)



3. Perform drive cycle T.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Drive Cycle.](#)
4. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE\$06.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>General Scan Tool.](#)

Caution:

- **When performing driving cycle, there should be 2 persons (driver and checker) and the checker should perform the data check.**
- **When performing the drive cycle on the public road, be very careful of the traffic condition and the safe driving must be the high priority.**

Note:


- **When the diagnostic value is 0, the diagnosis is incomplete. Therefore, do not stop the engine and perform the drive cycle again.**

- **Always keep on checking the data while reading out the diagnostic value because the diagnostic value is repeatedly updated.**


5. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 2] of the replaced oil control solenoid 1000 or more?

Yes

 [Go to 8.](#)

No

 [Go to 7.](#)

7. CHECK ON-BOARD MONITOR TEST RESULT.




Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 6.

Is the value of [VVT monitor bank 2] 1000 or less, and more than (value of [VVT monitor bank 1] $\times 1.5 + 100$) compared with the value of [VVT monitor bank 1]?

Yes

 [Go to 8.](#)

No





Idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)
 [Go to 17.](#)

8. CHECK HARNESS AND CONNECTOR.

Check for a bend, damage and poor contact of harness and connector.

Note:

Check the following items.






- **ECM**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)
- **Oil control solenoid**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Oil Control Solenoid>INSPECTION.](#)
- **Camshaft position sensor**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Camshaft Position Sensor>INSPECTION.](#)
- **Crankshaft position sensor**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Crankshaft Position Sensor Plate>INSPECTION.](#)

Is the check result OK?

Yes

 [Go to 9.](#)

No

Repair or replace faulty parts.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\)>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Oil Control Solenoid.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Camshaft Position Sensor.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Crankshaft Position Sensor Plate.](#)
 [Go to 9.](#)

9. CHECK HARNESS AND CONNECTOR (OPEN).


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the intake oil control solenoid LH.
4. Measure the resistance between intake oil control solenoid LH connector and ECM connector.

Connector & terminal


(B135) No. 6 — (E37) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 10.](#)

No

Repair or replace faulty parts.
 [Go to 17.](#)

10. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from intake camshaft position sensor LH.
4. Measure the resistance between the intake camshaft position sensor LH connector and ECM connector.

Connector & terminal


(B135) No. 41 — (E35) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 11.](#)

No

Repair or replace faulty parts.
 [Go to 17.](#)

11. CHECK HARNESS AND CONNECTOR (OPEN).




1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the crankshaft position sensor.
4. Measure the resistance between the crankshaft position sensor connector and ECM connector.

Connector & terminal

(B135) No. 40 — (E10) No. 1:


Is the resistance less than 1 Ω ?

Yes

 [Go to 12.](#)


No

Repair or replace faulty parts.

 [Go to 17.](#)


12. CHECK ENGINE OIL PRESSURE.



Check the engine oil pressure.  [Ref. to MECHANICAL\(H4DO\)>Engine Oil Pressure>INSPECTION.](#)

Is the oil pressure of engine oil normal?

Yes

 [Go to 14.](#)

No

 [Go to 13.](#)

13. CHECK OIL STRAINER.




Check the oil strainer.  [Ref. to LUBRICATION\(H4DO\)>Oil Pan>INSPECTION.](#)


Does any foreign matter exist at the oil strainer in the oil pan?

Yes

Check and clean inside the oil strainer.

 [Go to 14.](#)


No

Replace the chain cover.  [Ref. to MECHANICAL\(H4DO\)>Chain Cover.](#)



Caution:

Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an

appropriate amount (line diameter) of application.  [Ref. to MECHANICAL\(H4DO\)>Chain Cover>INSTALLATION.](#)

 [Go to 15.](#)

14. CHECK OIL PATH OF CHAIN COVER.


1. Remove the engine from the vehicle.  [Ref. to MECHANICAL\(H4DO\)>Engine Assembly>REMOVAL.](#)
2. Check the oil path of the chain cover.  [Ref. to MECHANICAL\(H4DO\)>Chain Cover>INSPECTION.](#)

Note:

Check the O-rings in the following oil path and also check that no foreign matter exists.


- Inlet of oil pump
- Outlet of oil pump
- Each O-ring in the path leading to left/right cylinder head
- Oil control solenoid
- Foreign matter exists

Is the check result OK?


 [Go to 15.](#)

Replace faulty parts. If there is any foreign matter, replace the chain cover.

 [Ref. to MECHANICAL\(H4DO\)>Chain Cover.](#)

 [Go to 15.](#)

15. CHECK THE CAMSHAFT CONDITION.

1. Remove the timing chain.  [Ref. to MECHANICAL\(H4DO\)>Timing Chain Assembly>REMOVAL.](#)
2. Rotate the camshaft by hand to compare the rotational resistance of the four.


Note:

Check the following items if there is a clearly faulty condition in the camshaft (bank 2) such as restriction or rotational resistance by comparing it with the rotational resistance of the camshaft (bank 1).




- Foreign matter attached to camshaft
- Damage of camshaft (scratching, galling, wear, etc.)
- Check for consequence from improper rotation of cam journal bearing

Is the check result OK?

Yes

 [Go to 16.](#)

No


Replace the cam carrier and camshaft.  [Ref. to MECHANICAL\(H4DO\)>Cam Carrier.](#)  [Ref. to MECHANICAL\(H4DO\)>Camshaft.](#)
 [Go to 16.](#)

16. CHECK OIL PASSAGE BETWEEN OIL PUMP AND OIL CONTROL SOLENOID.

Visually check the following parts of the oil passage from the oil pump to the oil control solenoid to check obvious defectiveness such as foreign matter, clogging, etc.

- Oil passage in cam Carrier
- Oil passage on cylinder head side
- Oil passage at the joint between cam sprocket and camshaft
- Oil passage at the back of sprocket and the end of camshaft when the sprocket is removed

Note:



[Refer to removal procedure of cam carrier in service manual.](#)  [Ref. to MECHANICAL\(H4DO\)>Cam Carrier>REMOVAL.](#)


Is the check result OK?

Yes


Replace the sprocket.  [Ref. to MECHANICAL\(H4DO\)>Cam Sprocket.](#)

Caution:



- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.**  [Ref. to MECHANICAL\(H4DO\)>Chain Cover>INSTALLATION.](#)
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DO\)>Cam Carrier>ASSEMBLY.](#)

 [Go to 17.](#)



No

Remove the foreign matter. Replace the cam carrier oil filter (reuse not allowed).  [Ref. to MECHANICAL\(H4DO\)>Cam Carrier.](#)

Caution:


- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.**  [Ref. to MECHANICAL\(H4DO\)>Chain Cover>INSTALLATION.](#)
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DO\)>Cam Carrier>ASSEMBLY.](#)

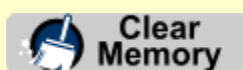
Note:



After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)

 [Go to 17.](#)

17. CHECK ON-BOARD MONITOR TEST RESULT.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)



2. Perform drive cycle T.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Drive Cycle.](#)
3. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE\$06.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>General Scan Tool.](#)

Caution:

- When performing driving cycle, there should be 2 persons (driver and checker) and the checker should perform the data check.
- When performing the drive cycle on the public road, be very careful of the traffic condition and the safe driving must be the high priority.


Note:

- When the diagnostic value is 0, the diagnosis is incomplete. Therefore, do not stop the engine and perform the drive cycle again.
- Keep on checking the data during drive cycle because the diagnostic value is repeatedly updated.


4. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of[VVT monitor bank 2] 1000 or more?

Yes

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)

No


 [Go to 18.](#)

18. CHECK DTC.

Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 17.

Is the value of [VVT monitor bank 2] 1000 or less, and more than (value of [VVT monitor bank 1] ×1.5+ 100) compared with the value of [VVT monitor bank 1]?

Yes


Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Engine Control Module \(ECM\).](#)

No

End.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0011.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0011 "A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1.](#)



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0030 A/F / O2 HEATER CONTROL CIRCUIT BANK 1 SENSOR 1

DTC detecting condition:

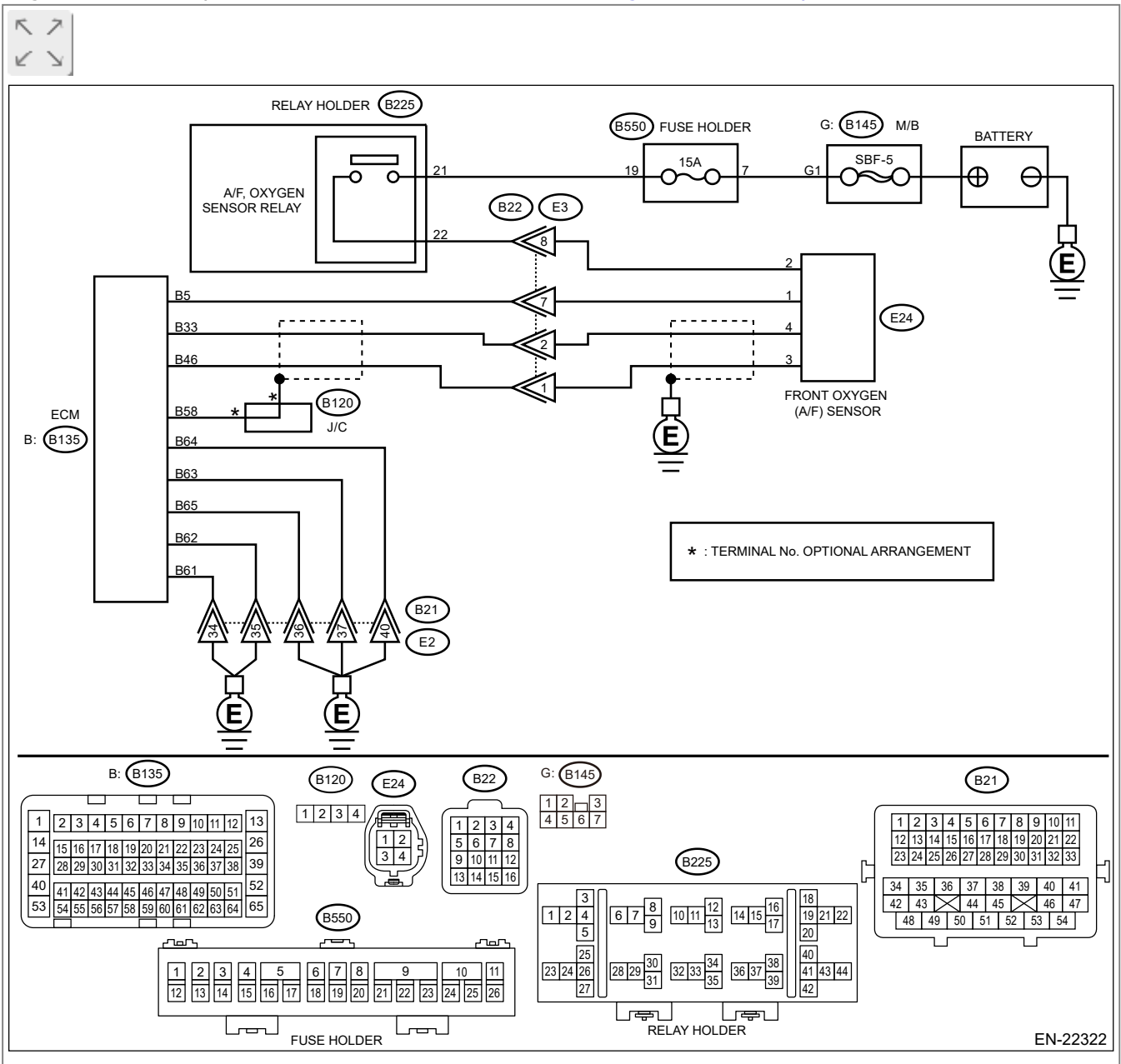
Detected when two consecutive driving cycles with fault occur.

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)




1. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

1. Start and warm up the engine.
2. Turn the ignition switch to OFF.
3. Disconnect the connectors from front oxygen (A/F) sensor.
4. Disconnect the connector from ECM.
5. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

Connector & terminal

- (B136) No. 5 — (E24) No. 1: Oxygen sensor heater characteristic (bank 1 sensor 1)
- (B136) No. 46 — (E24) No. 3:
- (B136) No. 33 — (E24) No. 4:

Is the resistance less than 1 Ω ?

 [Go to 2.](#)

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and front oxygen (A/F) sensor connector**
- **Poor contact of coupling connector**

2. CHECK FRONT OXYGEN (A/F) SENSOR.


Measure the resistance between front oxygen (A/F) sensor terminals.

Terminals

No. 1 — No. 2:

Is the resistance 2 — 3 Ω ?

 [Go to 3.](#)

Replace the front oxygen (A/F) sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Front Oxygen \(A/F\) Sensor.](#)

3. CHECK FOR POOR CONTACT.

Check for poor contact of ECM and front oxygen (A/F) sensor connector.

Is there poor contact of ECM or front oxygen (A/F) sensor connector?

Yes

Repair the poor contact of ECM or front oxygen (A/F) sensor connector.

No

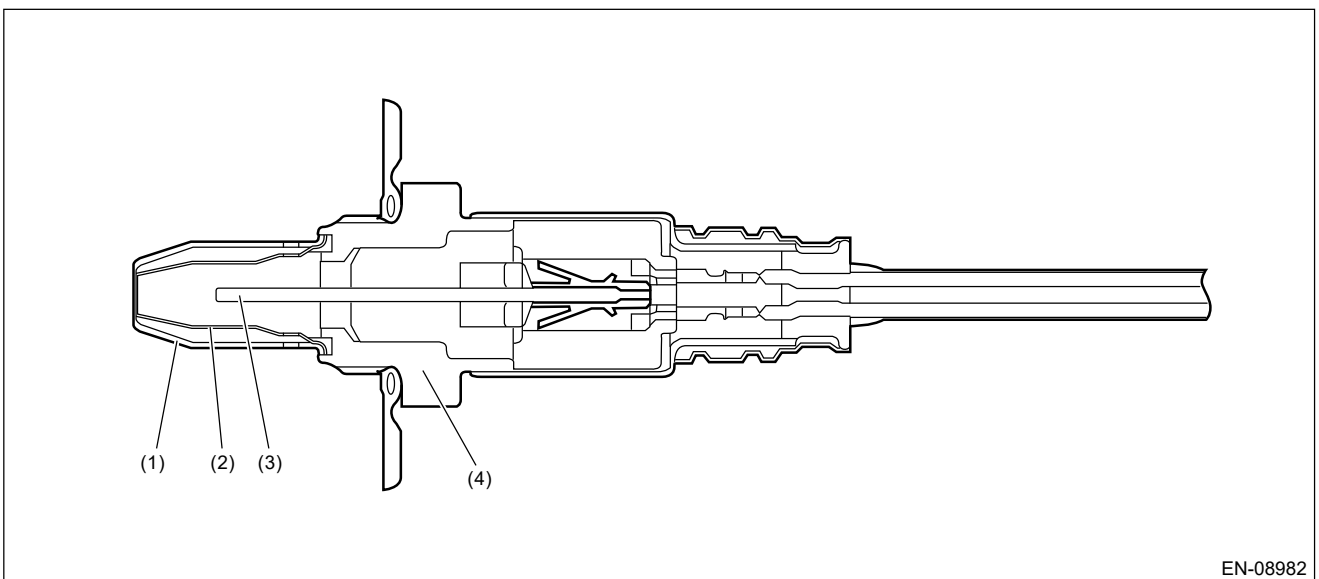
Replace the front oxygen (A/F) sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Front Oxygen \(A/F\) Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect functional errors of the front oxygen (A/F) sensor heater.

Judge as NG when it is determined that the front oxygen (A/F) sensor impedance is large when looking at engine status such as deceleration fuel cut.

2. COMPONENT DESCRIPTION



(1) Element cover (outer)

(3) Sensor element

(4) Sensor housing

(2) Element cover (inner)

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
A/F sensor heater control duty	$> 17\%$
Elapsed time after returning from the fuel cut	$\geq 20000\text{ms}$

4. GENERAL DRIVING CYCLE

After starting the engine, perform the diagnosis continuously when engine is low speed.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Front oxygen (A/F) sensor impedance	> 82Ω

Time needed for diagnosis: 10000ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0031 A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 1

DTC detecting condition:

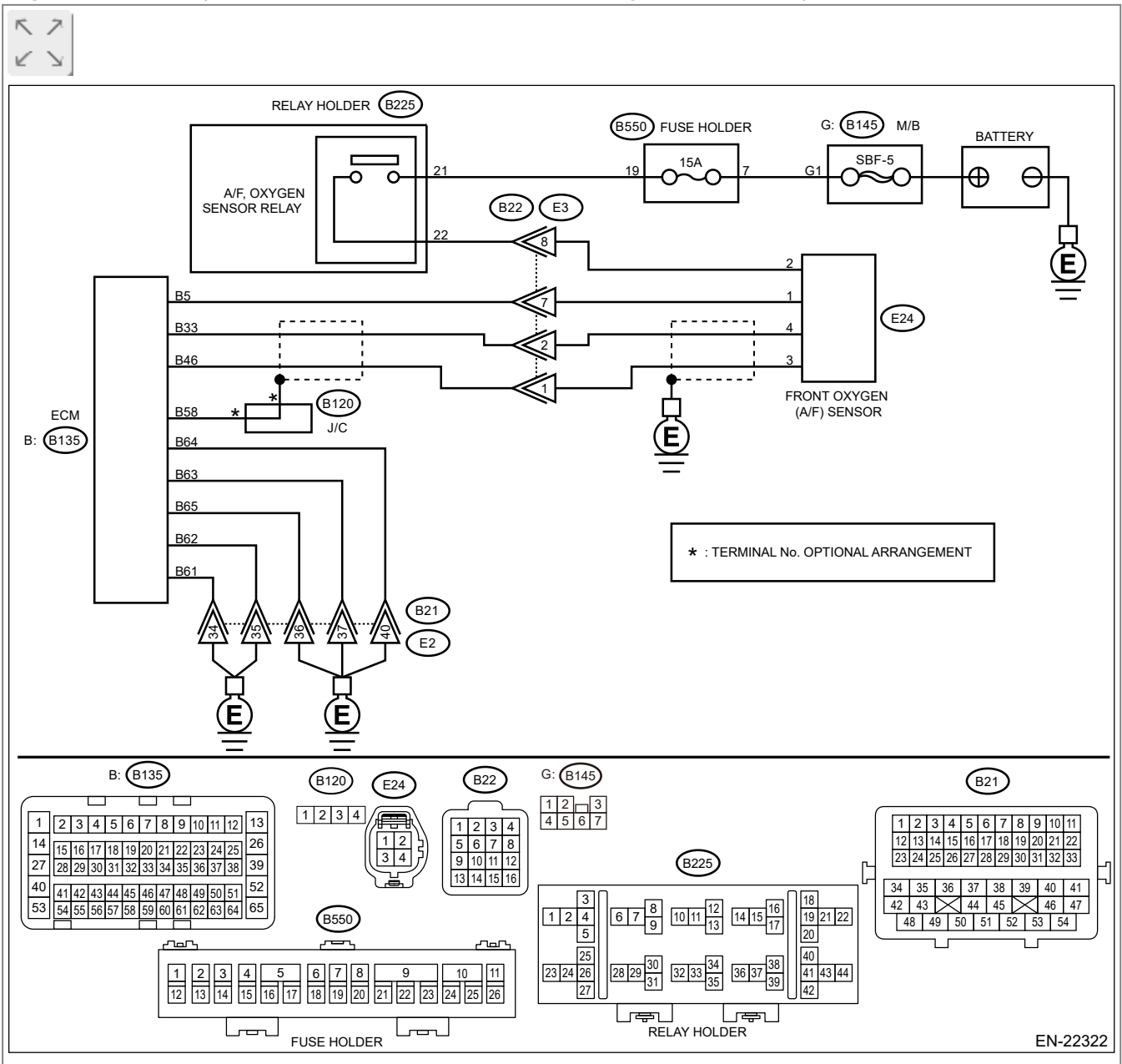
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK POWER SUPPLY TO FRONT OXYGEN (A/F) SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between front oxygen (A/F) sensor connector and engine ground.

Connector & terminal

(E24) No. 2 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

Repair the power supply line.

Note:

In this case, repair the following item:

- **Open circuit in harness between A/F, oxygen sensor relay connector and front oxygen (A/F) sensor connector**
- **Poor contact of A/F, oxygen sensor relay connector**
- **Poor contact of coupling connector**
- **Malfunction of A/F, oxygen sensor relay**

2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and front oxygen (A/F) sensor connector.

Connector & terminal

(B135) No. 5 — (E24) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and front oxygen (A/F) sensor connector**
- **Poor contact of coupling connector**

3. CHECK GROUND CIRCUIT FOR ECM.


Measure the resistance of harness between ECM connector and chassis ground.

Connector & terminal

- (B135) No. 61 — Chassis ground:
- (B135) No. 62 — Chassis ground:
- (B135) No. 63 — Chassis ground:
- (B135) No. 64 — Chassis ground:
- (B135) No. 65 — Chassis ground:

Is the resistance less than 5 Ω?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and engine ground**
- **Poor contact of coupling connector**

4. CHECK FRONT OXYGEN (A/F) SENSOR.

Measure the resistance between front oxygen (A/F) sensor terminals.

Terminals


No. 1 —No. 2:

Is the resistance 2 — 3 Ω?

Yes

Repair the poor contact of ECM connector.

No

Replace the front oxygen (A/F) sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Front Oxygen \(A/F\) Sensor.](#)

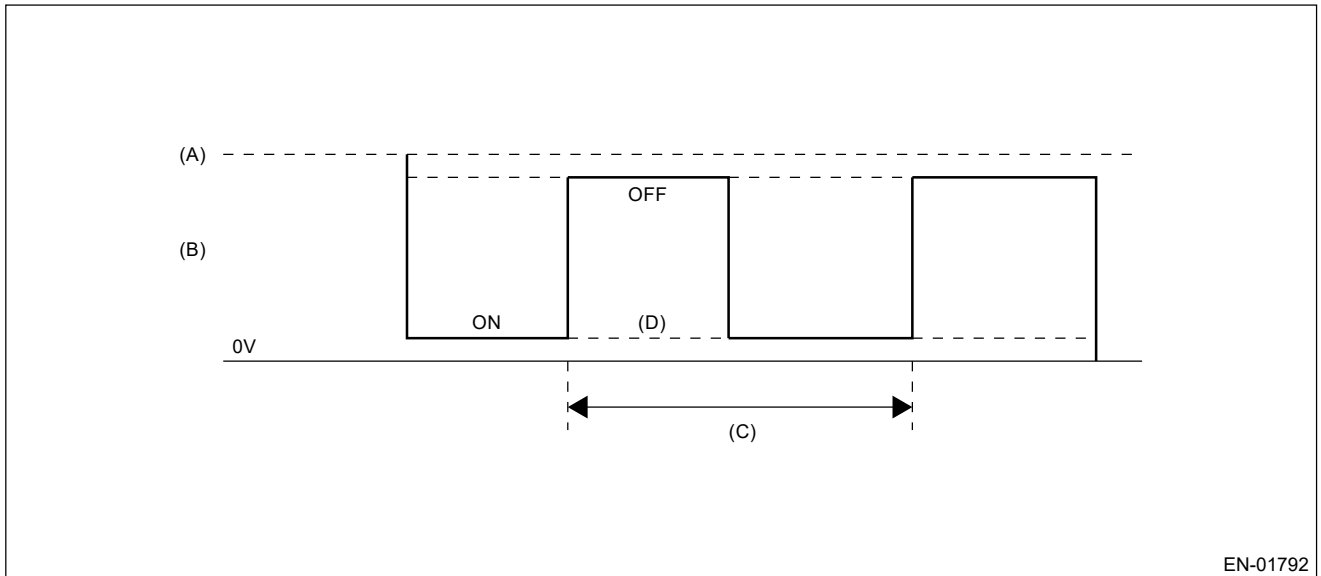
1. OUTLINE OF DIAGNOSIS

Detect front oxygen (A/F) sensor heater open or short circuit.

The front oxygen (A/F) sensor heater performs duty control, and the output terminal voltage at ON is 0 V, and the output terminal voltage at OFF is the battery voltage.

Judge as NG when the terminal voltage remains Low.

2. COMPONENT DESCRIPTION



(A) Battery voltage

(B) Front oxygen (A/F) sensor
heater output voltage

(C) 128 ms

(D) Low error

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Front oxygen (A/F) sensor heater control duty	$< 87.5\%$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$< 1.9 \text{ V}$

Time needed for diagnosis: 1000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0032 A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 1

DTC detecting condition:

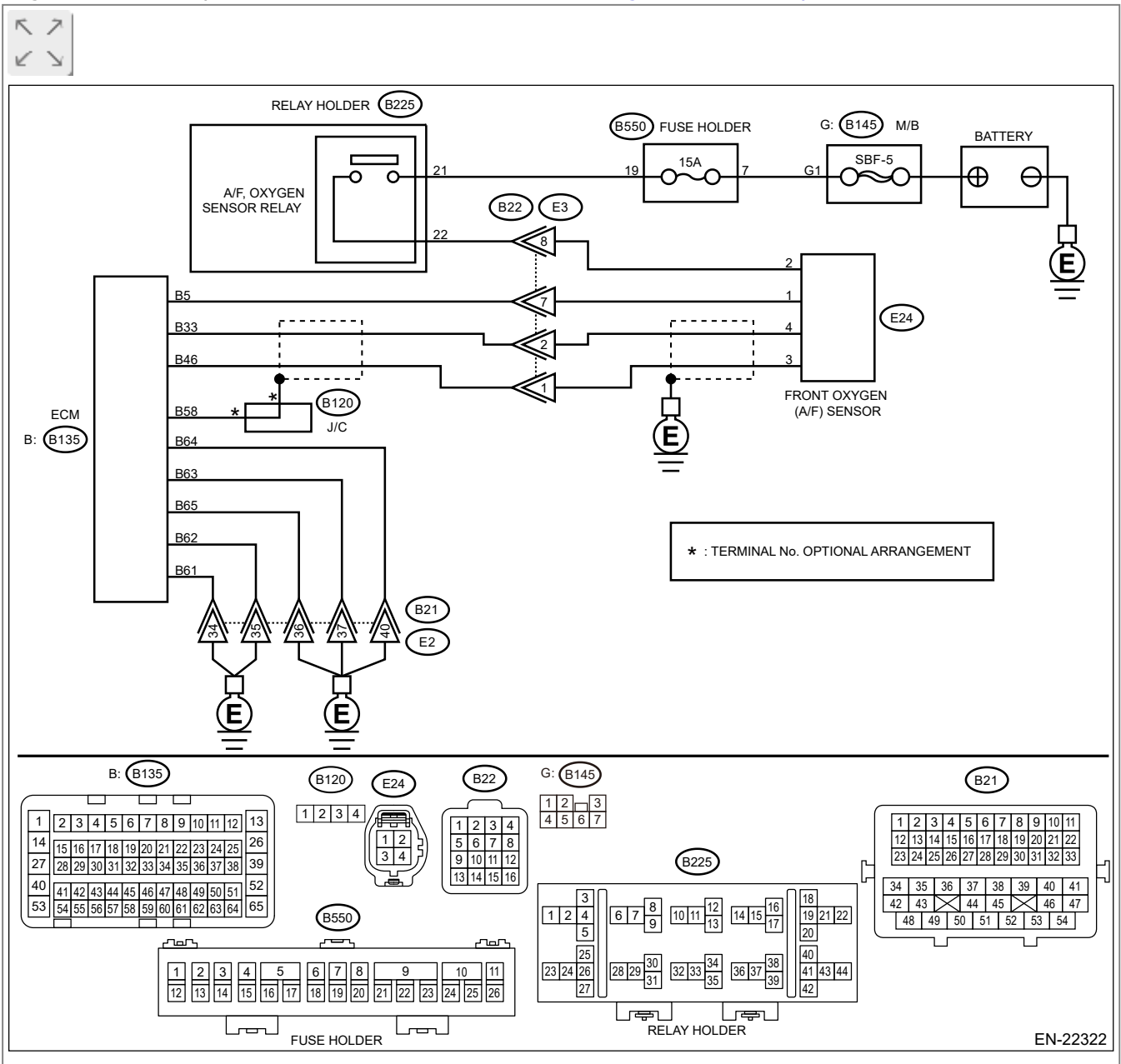
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B135) No. 5 (+) – Chassis ground (-):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power in the harness between ECM connector and front oxygen (A/F) sensor connector.

No

 [Go to 2.](#)

2. CHECK GROUND CIRCUIT FOR ECM.



1. Disconnect the connector from ECM.
2. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B135) No. 61 – Chassis ground:
(B135) No. 62 – Chassis ground:
(B135) No. 63 – Chassis ground:
(B135) No. 64 – Chassis ground:
(B135) No. 65 – Chassis ground:

Is the resistance less than 5 Ω ?

Yes

Repair the poor contact of ECM connector.

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and engine ground**
- **Poor contact of coupling connector**

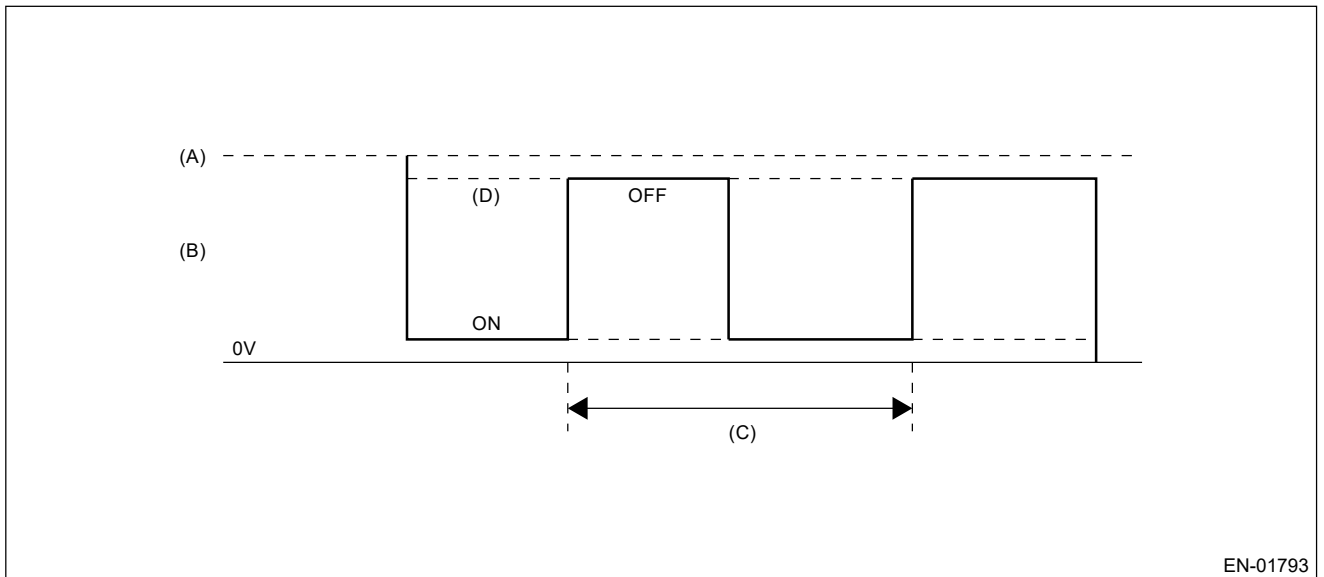
1. OUTLINE OF DIAGNOSIS

Detect front oxygen (A/F) sensor heater open or short circuit.

The front oxygen (A/F) sensor heater performs duty control, and the output terminal voltage at ON is 0 V, and the output terminal voltage at OFF is the battery voltage.

Judge as NG when the terminal voltage remains High.

2. COMPONENT DESCRIPTION



(A) Battery voltage

(B) Front oxygen (A/F) sensor
heater output voltage

(C) 128 ms

(D) High error

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Front oxygen (A/F) sensor heater control duty	$> 12.5\%$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$\geq 1.9 \text{ V}$

Time needed for diagnosis: 2000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0037 A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 2

DTC detecting condition:

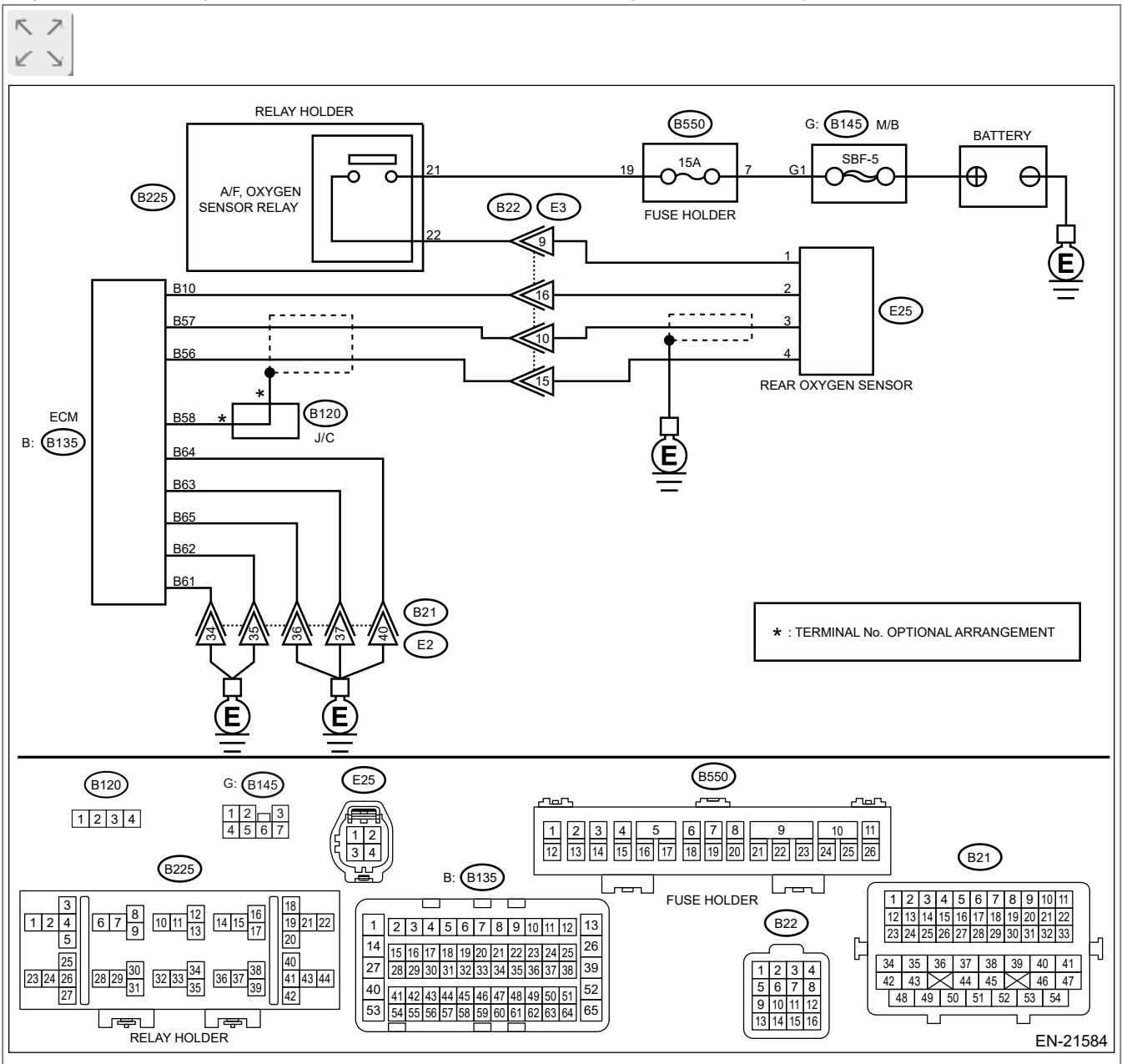
Detected when two consecutive driving cycles with fault occur.

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK POWER SUPPLY TO REAR OXYGEN SENSOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from rear oxygen sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between rear oxygen sensor connector and engine ground.

Connector & terminal

(E25) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

Repair the power supply line. Or replace the main relay.

Note:

In this case, repair the following item:

- Open circuit in harness between A/F, oxygen sensor relay connector and rear oxygen sensor connector
- Poor contact of A/F, oxygen sensor relay connector
- Poor contact of coupling connector
- Malfunction of A/F, oxygen sensor relay

2. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and oxygen sensor connector.

Connector & terminal

(B135) No. 65 — (E25) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- Open circuit in harness between ECM connector and rear oxygen sensor connector
- Poor contact of coupling connector

3. CHECK GROUND CIRCUIT FOR ECM.



Measure the resistance of harness between ECM connector and chassis ground.

Connector & terminal

- (B135) No. 61 — Chassis ground:
- (B135) No. 62 — Chassis ground:
- (B135) No. 63 — Chassis ground:
- (B135) No. 64 — Chassis ground:
- (B135) No. 65 — Chassis ground:

Is the resistance less than 5 Ω?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and engine ground**
- **Poor contact of coupling connector**

4. CHECK REAR OXYGEN SENSOR.



Measure the resistance between rear oxygen sensor terminals.

Terminals


No. 2 —No. 1:

Is the resistance 5 — 6.4 Ω?

Yes

Repair the poor contact of ECM connector.

No

Replace the rear oxygen sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Rear Oxygen Sensor.](#)

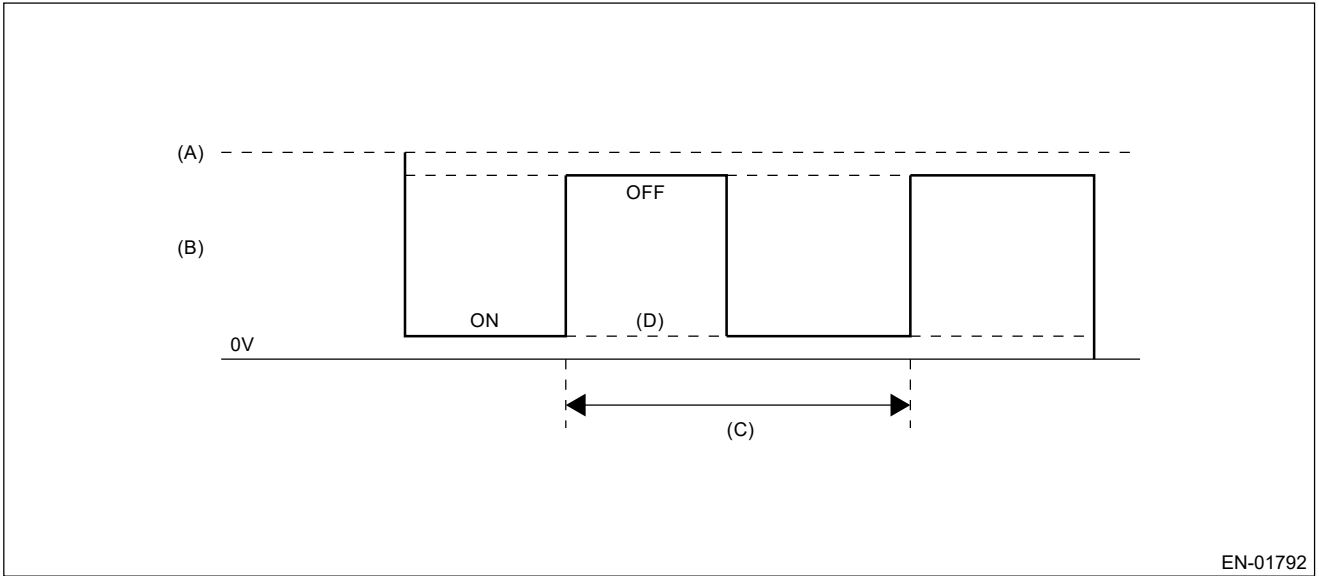
1. OUTLINE OF DIAGNOSIS

Detect the rear oxygen sensor heater open or short circuit.

The rear oxygen sensor heater performs duty control, and the output terminal voltage at ON is 0 V, and the output terminal voltage at OFF is the battery voltage.

Judge as NG when the terminal voltage remains Low.

2. COMPONENT DESCRIPTION



- (A) Battery voltage
 (B) Output voltage of the rear oxygen sensor heater
 (C) 256 ms (cycles)
 (D) Low error

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Rear oxygen sensor heater control duty	$< 75\%$

4. GENERAL DRIVING CYCLE

After starting the engine, perform the diagnosis continuously when engine is low speed.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$< \text{Battery Voltage} \times 0.2 \text{ V}$

Time needed for diagnosis: 10000 ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0038 A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 2

DTC detecting condition:

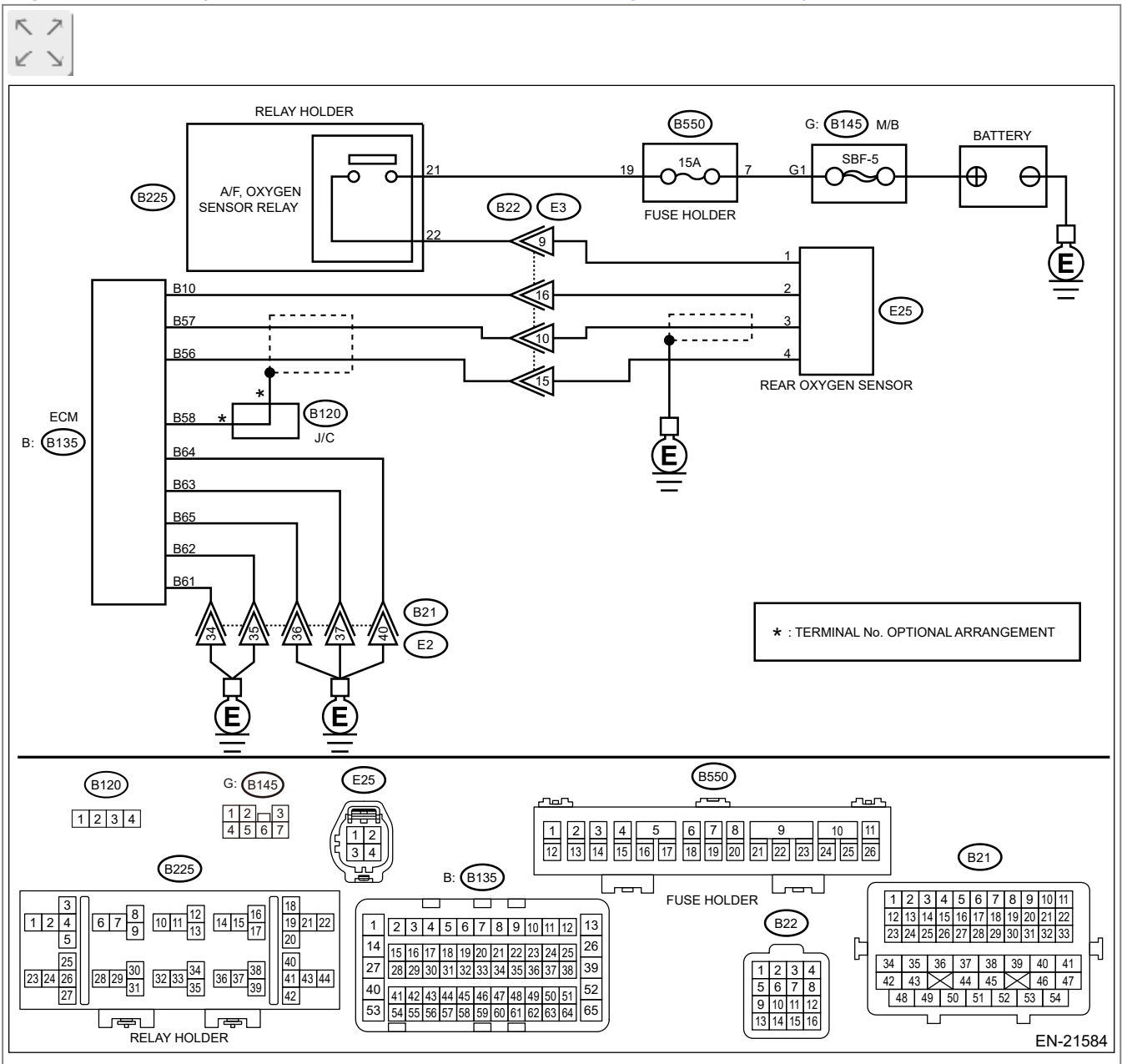
Detected when two consecutive driving cycles with fault occur.

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Measure the voltage between ECM connector and chassis ground.

Connector & terminal


(B135) No. 10 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power in the harness between ECM connector and rear oxygen sensor connector.

No

 [Go to 2.](#)

2. CHECK GROUND CIRCUIT FOR ECM.



1. Disconnect the connector from ECM.
2. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B135) No. 61 — Chassis ground:
(B135) No. 62 — Chassis ground:
(B135) No. 63 — Chassis ground:
(B135) No. 64 — Chassis ground:
(B135) No. 65 — Chassis ground:

Is the resistance less than 5 Ω ?

Yes

Repair the poor contact of ECM connector.

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and engine ground**
- **Poor contact of coupling connector**

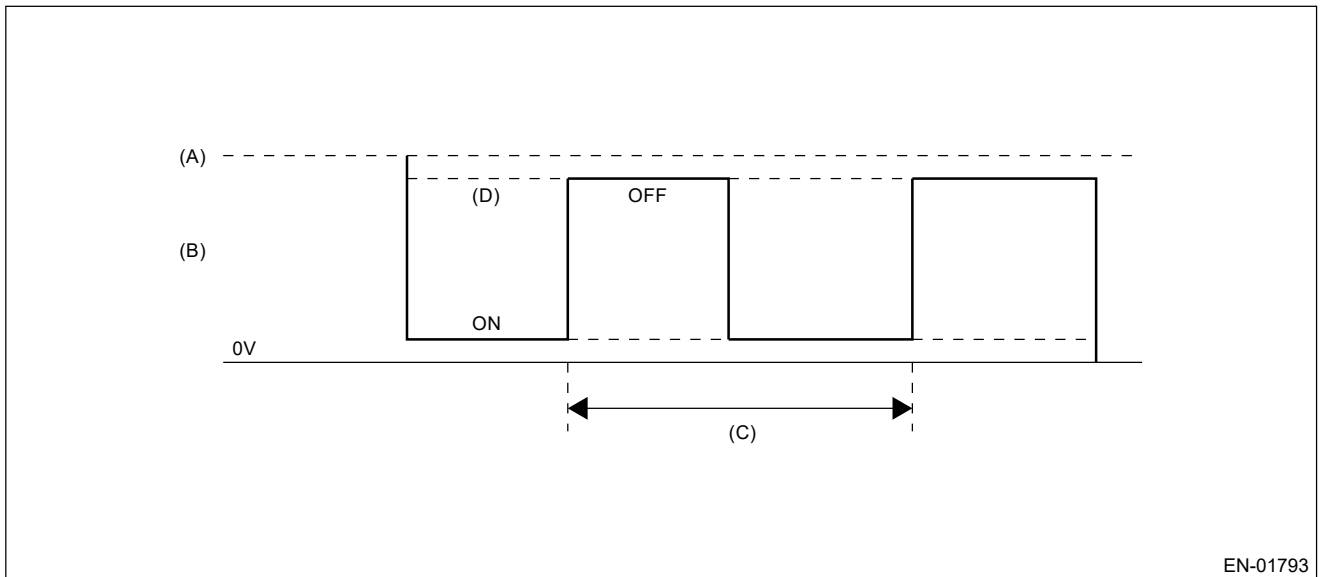
1. OUTLINE OF DIAGNOSIS

Detect the rear oxygen sensor heater open or short circuit.

The rear oxygen sensor heater performs duty control, and the output terminal voltage at ON is 0 V, and the output terminal voltage at OFF is the battery voltage.

Judge as NG when the terminal voltage remains High.

2. COMPONENT DESCRIPTION



(A) Battery voltage

(B) Output voltage of the rear oxygen sensor heater

(C) 256 ms (cycles)

(D) High error

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Rear oxygen sensor heater control duty	$\geq 20\%$

4. GENERAL DRIVING CYCLE

After starting the engine, perform the diagnosis continuously when engine is low speed.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$\leq \text{Battery voltage} \times 0.2 \text{ V}$

Time needed for diagnosis: 2560 ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0068 MAP/MAF - THROTTLE POSITION CORRELATION

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE..

1. CHECK AIR INTAKE SYSTEM.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes

Repair the air intake system.


No

 [Go to 2.](#)

2. CHECK MANIFOLD ABSOLUTE PRESSURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. For CVT models, set the select lever to "P" range or "N" range, and for MT models, place the shift lever in the neutral position.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Using the Subaru Select Monitor or a general scan tool, read the value of [Mani. Absolute Pressure].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Subaru Select Monitor.
- **General scan tool**
For detailed operation procedures, refer to the "General Scan Tool Instruction Manual".

Is the value of [Mani. Absolute Pressure] 73.3 — 106.6 kPa (550 — 800 mmHg, 21.65 — 31.50 inHg) at ignition ON, and 20.0 — 46.7 kPa (150 — 350 mmHg, 5.91 — 13.78 inHg) at idling?

Yes

 [Go to 3.](#)

No

Replace the manifold absolute pressure sensor. [🔗 Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Manifold Absolute Pressure Sensor.](#)

3. CHECK THROTTLE OPENING ANGLE.

Using the Subaru Select Monitor or a general scan tool, read the value of [Throttle Opening Angle].

Note:

- **Subaru Select Monitor**

For detailed procedures, refer to "Data Monitor". [🔗 Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)

- **General scan tool**

For detailed operation procedures, refer to the "General Scan Tool Instruction Manual".

Is the value of [Throttle Opening Angle] less than 5% when throttle is fully closed?

Yes

[🔗 Go to 4.](#)

No

Replace the electronic throttle control. [🔗 Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Throttle Body.](#)

4. CHECK THROTTLE OPENING ANGLE.

Is the value of [Throttle Opening Angle] 85% or more when throttle is fully open?

Yes

Replace the manifold absolute pressure sensor. [🔗 Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Manifold Absolute Pressure Sensor.](#)

No

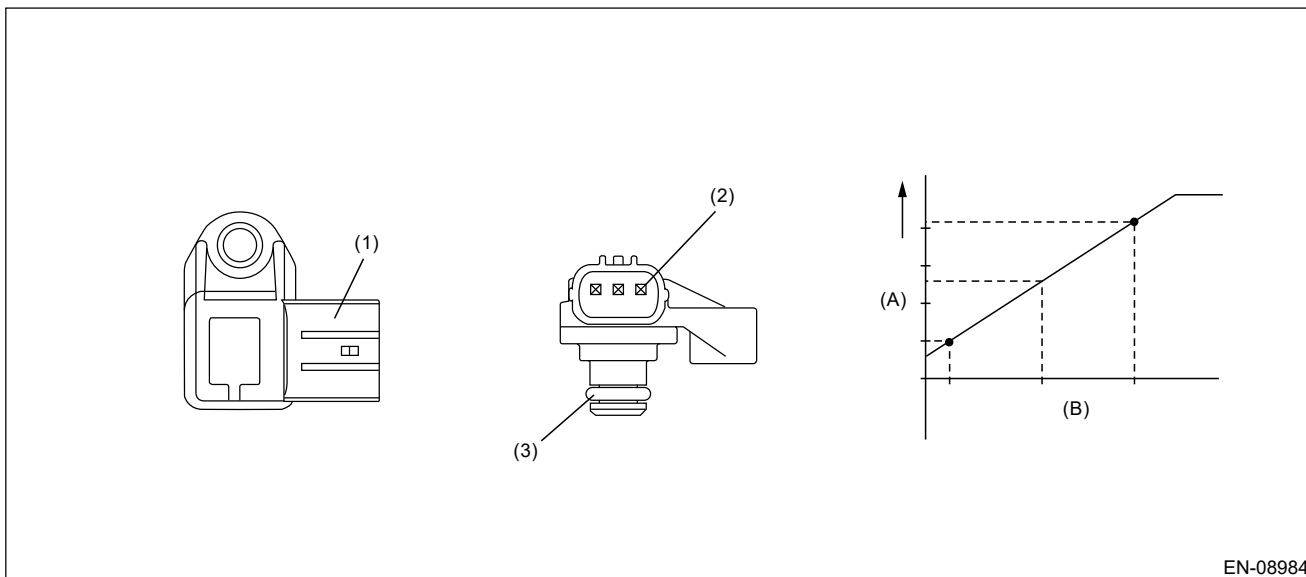
Replace the electronic throttle control. [🔗 Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Throttle Body.](#)

1. OUTLINE OF DIAGNOSIS

Detect problems in the intake manifold pressure sensor output properties.

Judge as NG when the intake air pressure AD value is Low whereas it seemed to be High from the viewpoint of engine condition, or when it is High whereas it seemed to be Low from the engine condition.

2. COMPONENT DESCRIPTION



EN-08984

(A) Output voltage

(B) Absolute pressure

(1) Connector

(2) Terminals

(3) O-ring

3. EXECUTION CONDITION

Low

Secondary Parameters	Execution condition
Engine speed	< 3000rpm
Charging efficiency (with atmospheric pressure compensation)	> 0.8g/rev (0.03oz/rev)
Throttle position	≥ 15°

High

Secondary Parameters	Execution condition
Engine speed	≥ 525rpm and < 925rpm
Charging efficiency (with atmospheric pressure compensation)	< 0.375g/rev (0.01oz/rev)
Throttle position	≤ 5.4°

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after idling.

5. DIAGNOSTIC METHOD

Judge as NG when Low side or High side becomes NG.

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Low Output voltage	< 2.31V
High Output voltage	≥ 2.31V

Time needed for diagnosis:

Low side: 5000ms

High side: 5000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0071 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" RANGE/PERFORMANCE

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE..

1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>List of Diagnostic Trouble Code (DTC).


No

 Go to 2.

2. CHECK DATA MONITOR.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Ambient Temperature Sensor Signal].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Subaru Select Monitor.
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

3. Read the change of the value in [Ambient Temperature Sensor Signal] while heating and cooling the ambient sensor using a hair dryer.

Caution:

Do not heat the part to the temperature where you cannot touch it with your bare hand in order to prevent burning yourself and protect the part.

Does the value of [Ambient Temperature Sensor Signal] change between heating and cooling?

Yes

Repair the poor contact of ECM connector.

No

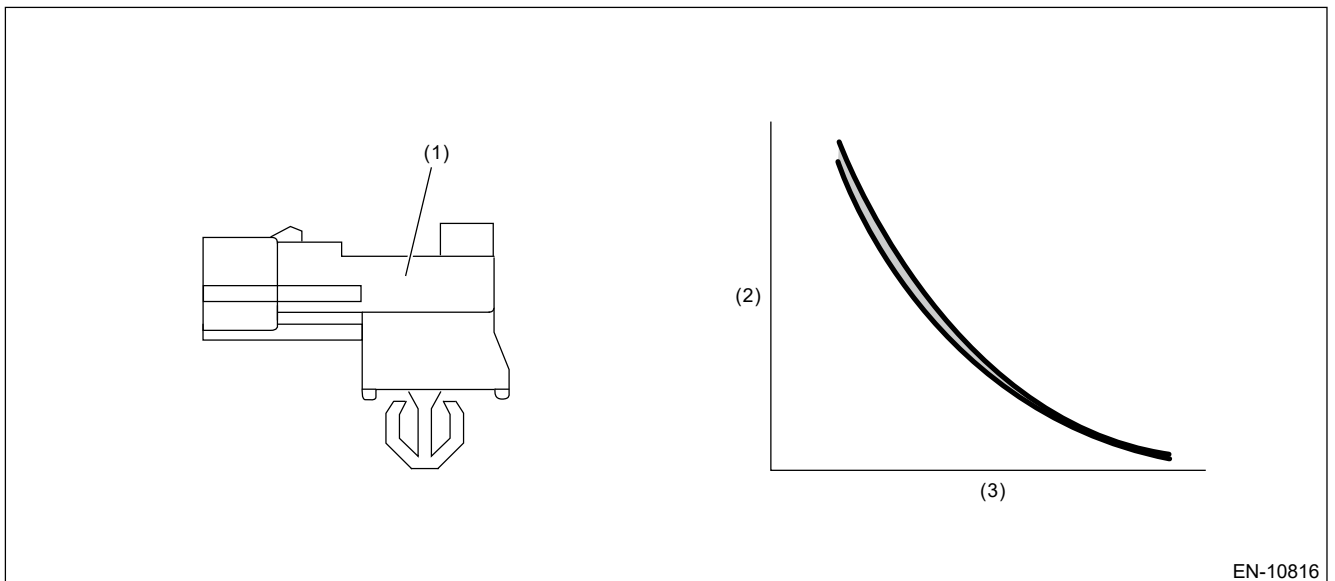
Replace the ambient sensor.  Ref. to HVAC SYSTEM (HEATER, VENTILATOR

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of ambient temperature sensor characteristics.

After the engine starts after the specified period of soaking time has elapsed, judge by correlation between ambient temperature sensor value, intake air temperature sensor value and engine coolant temperature sensor value. Judge as NG when the differences are both above the specified value by comparing between ambient air temperature and intake air temperature, ambient air temperature and engine coolant temperature.

2. COMPONENT DESCRIPTION



(1) Ambient sensor

(2) Resistance value (kΩ)

(3) Ambient air temperature (°C (°F))

3. GENERAL DRIVING CYCLE

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Soaking time	≥ 21600s
Block heater judgment	Completed
Block heater operation	Not in operation

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once after the engine starts after a certain period of soaking time.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Ambient air temperature 30 sec. after engine start – Intake air temperature 30 sec. after engine start	> Value from Map
Ambient air temperature at engine start – Engine coolant temperature at engine start	> 25°C (77°F)

Map

Intake air temperature °C (°F)	-30 (-22)	45 (86)	60 (113)	80 (140)
Ambient air temperature 30 sec. after engine start – Intake air temperature 30 sec. after engine start °C (°F)	20 (36)	20 (36)	32 (57.6)	32 (57.6)

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0072 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" LOW

DTC detecting condition:

Immediately at fault recognition

1. CHECK DTC.

Check for DTC. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is [P0072] or [P0073] displayed in current malfunction?

Yes

[Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK COMBINATION METER.

Check the combination meter system. [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is the combination meter system normal?

Yes

Repair the poor contact of ECM connector.

No

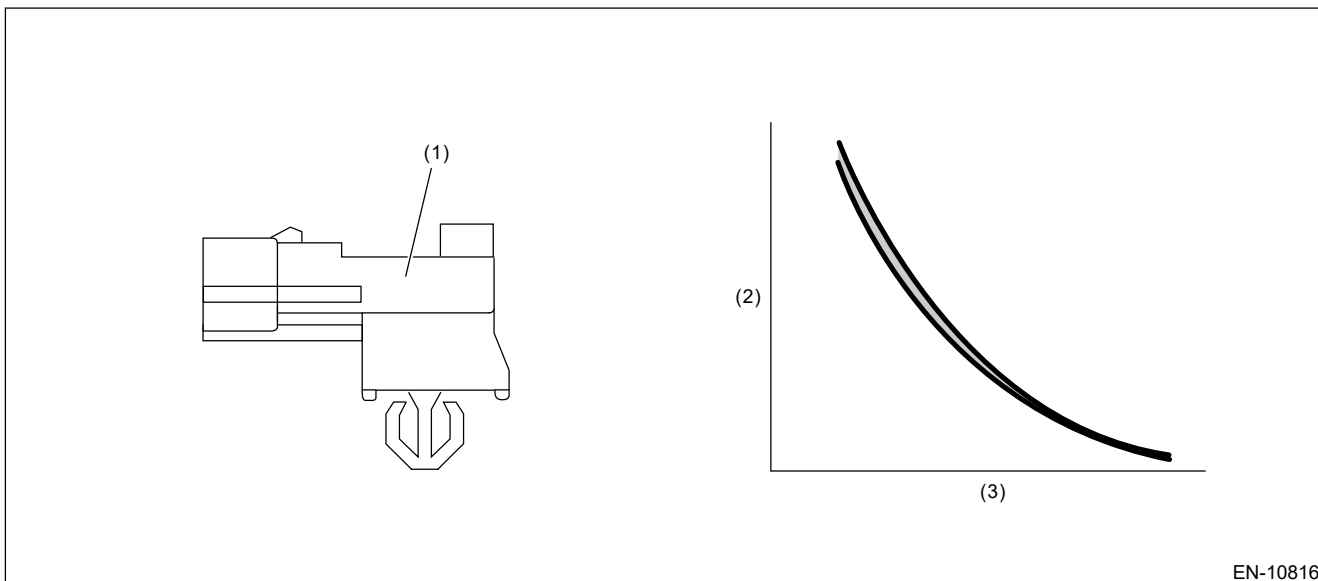
Repair the combination meter system. [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of ambient temperature sensor.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-10816

(1) Ambient sensor

(2) Resistance value (kΩ)

(3) Ambient air temperature (°C (°F))

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V

4. GENERAL DRIVING CYCLE

Perform the diagnosis every time after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	< 0.42 V


Time needed for diagnosis: 2500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0073 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" HIGH

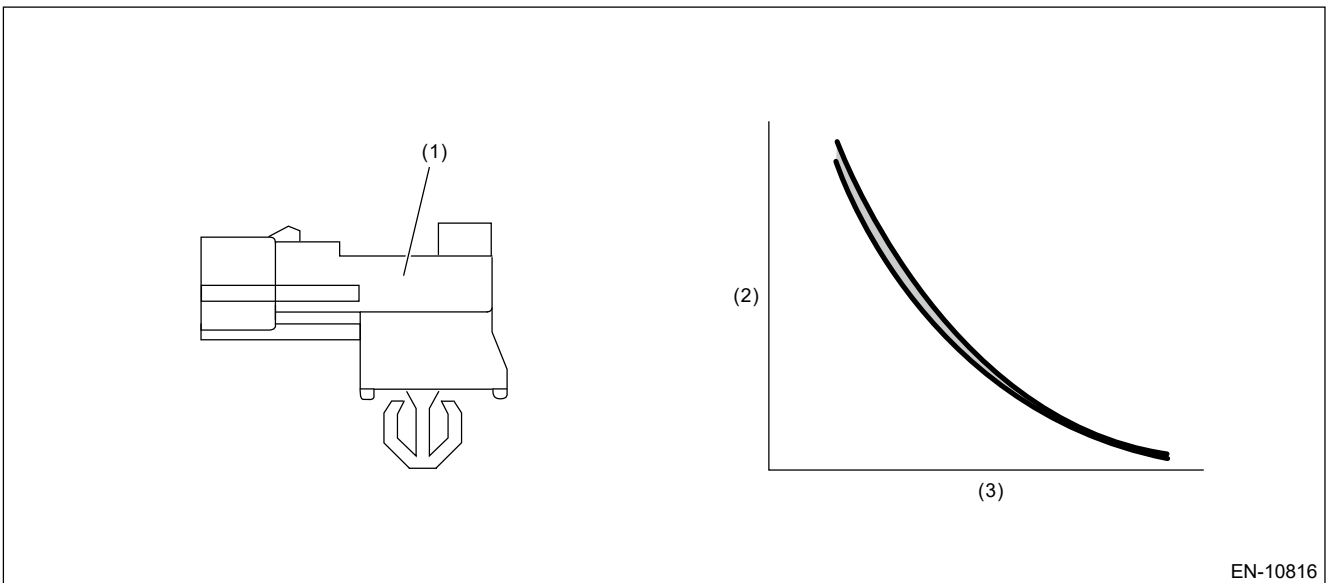
Note:

For the diagnostic procedure, refer to DTC P0072.  Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0072 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" LOW.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of ambient temperature sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-10816

(1) Ambient sensor

(2) Resistance value (kΩ)

(3) Ambient air temperature (°C (°F))

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V

4. GENERAL DRIVING CYCLE

Perform the diagnosis every time after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

--	--

Malfunction Criteria	Threshold Value
Output voltage	> 4.88 V

Time needed for diagnosis: 2500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0101 MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT RANGE/PERFORMANCE



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Improper idling
- Engine stalls.
- Poor driving performance

Caution:


After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE..

1. CHECK FOR ANY OTHER DTC ON DISPLAY.




Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>List of Diagnostic Trouble Code (DTC).

No

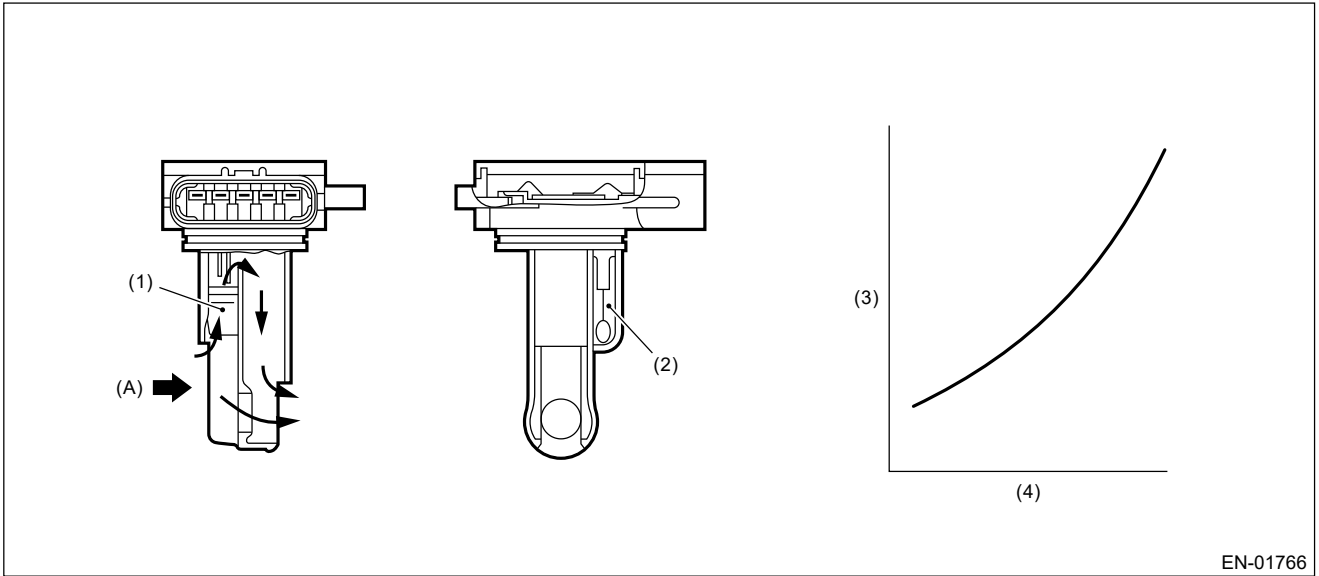
Replace the mass air flow and intake air temperature sensor.  Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of air flow sensor output properties.

Judge as a low side NG when the air flow voltage indicates a small value regardless of running in a state where the air flow voltage increases. Judge as a high side NG when the air flow voltage indicates a large value regardless of running in a state where the air flow voltage decreases. Judge air flow sensor property NG when the Low side or High side becomes NG.

2. COMPONENT DESCRIPTION



(A) Air

(1) Air flow sensor

(3) Voltage (V)

(4) Amount of intake air (kg (lb)/s)

(2) Intake air temperature sensor

3. EXECUTION CONDITION

Low

Secondary Parameters	Execution condition
Engine speed	$\geq 1900\text{rpm}$
Throttle position	$\geq 15^\circ$
Intake manifold pressure (with atmospheric pressure compensation)	$\geq 86.7\text{kPa}$ (650mmHg, 25.6in Hg)

High

Secondary Parameters	Execution condition
Engine speed	$\geq 525\text{rpm}$ and $< 925\text{rpm}$
Throttle position	$< 5.4^\circ$
Intake manifold pressure (with atmospheric pressure compensation)	$< 46\text{kPa}$ (345mmHg, 13.6inHg)

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after idling.

5. DIAGNOSTIC METHOD

Judge as NG when Low side or High side becomes NG.

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Low Output voltage	< Map 1
High Output voltage	≥ Map 2

Map 1

Engine speed (rpm)	1900	3000	4000	5000	6000	6800
Output voltage (V)	1.73	1.96	2.12	2.25	2.37	2.45

Map 2

Engine speed (rpm)	525	700	925
Output voltage (V)	1.69	1.83	1.97

Time needed for diagnosis:

Low: 5000ms

High: 5000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0102 MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT LOW



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Engine stalls.
- Poor driving performance

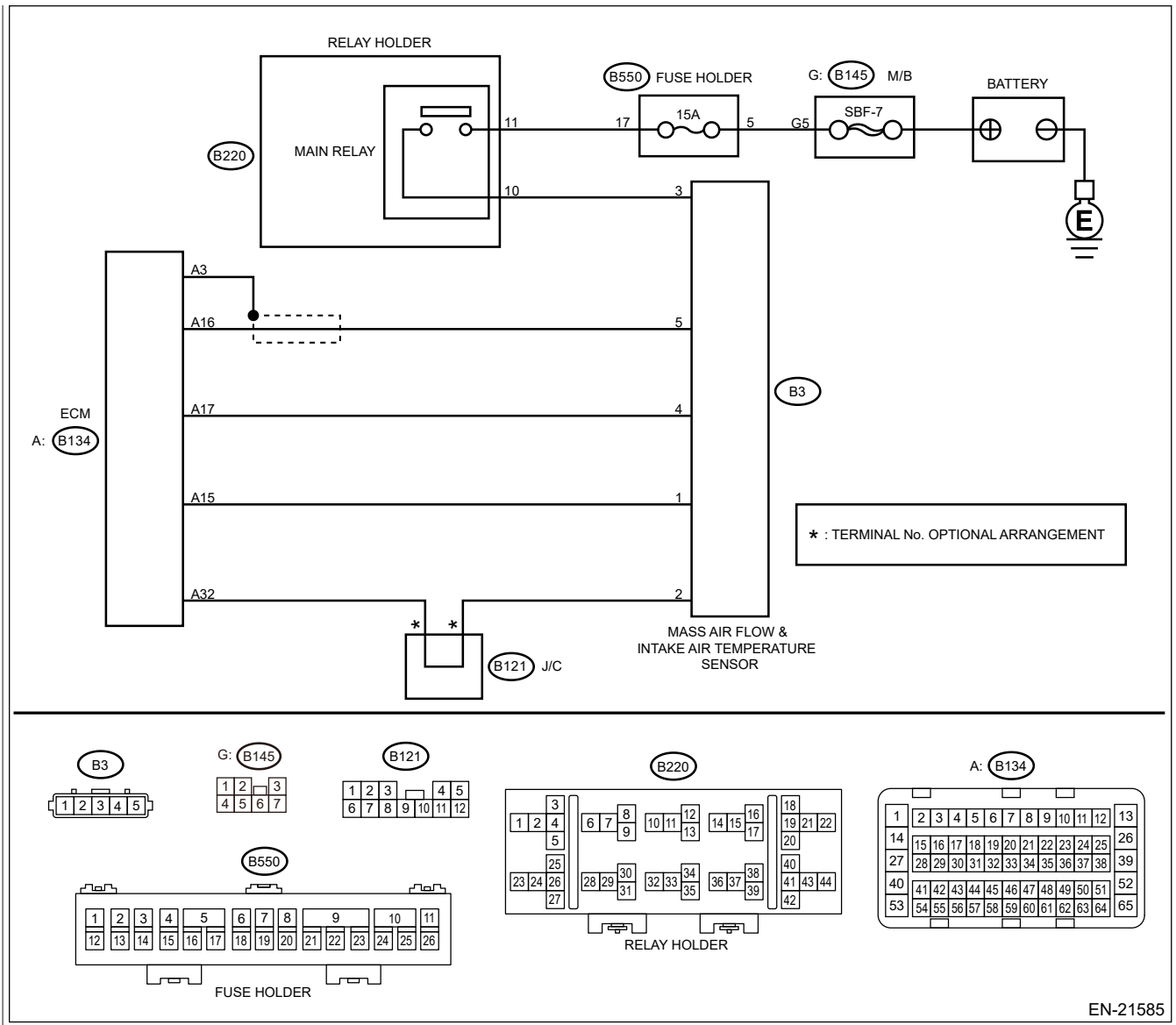
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21585

1. CHECK DATA MONITOR.



1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Air Flow Sensor Voltage].

Note:

For detailed procedures, refer to "Data Monitor". **Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Subaru Select Monitor.**

Is the value of [Air Flow Sensor Voltage] less than 0.2 V?

Yes

[Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK POWER SUPPLY OF MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the mass air flow and intake air temperature sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between mass air flow and intake air temperature sensor connector and engine ground.

Connector & terminal

(B3) No. 3 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between main relay and mass air flow and intake air temperature sensor connector**
- **Poor contact of main relay connector**

3. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

Connector & terminal

(B134) No. 16 — (B3) No. 5:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Repair the open circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

4. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.




Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 16 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 5.](#)

No

Repair the ground short circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

5. CHECK FOR POOR CONTACT.




Check for poor contact of ECM and mass air flow and intake air temperature sensor connector.

Is there poor contact of ECM or mass air flow and intake air temperature sensor connector?

Yes

Repair the poor contact of ECM or mass air flow and intake air temperature sensor connector.

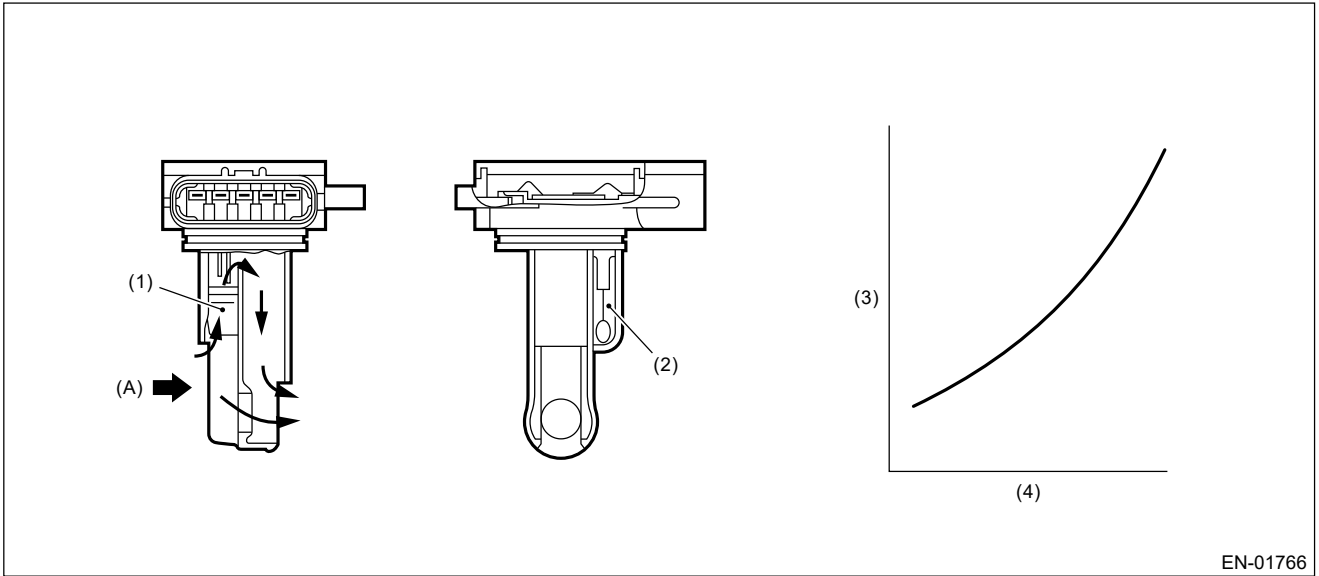
No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect open or short circuits of the air flow sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(A) Air

(1) Air flow sensor

(3) Voltage (V)

(4) Amount of intake air (kg (lb)/s)

(2) Intake air temperature sensor

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	< 0.22V

Time needed for diagnosis: 500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0103 MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT HIGH



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Engine stalls.
- Poor driving performance

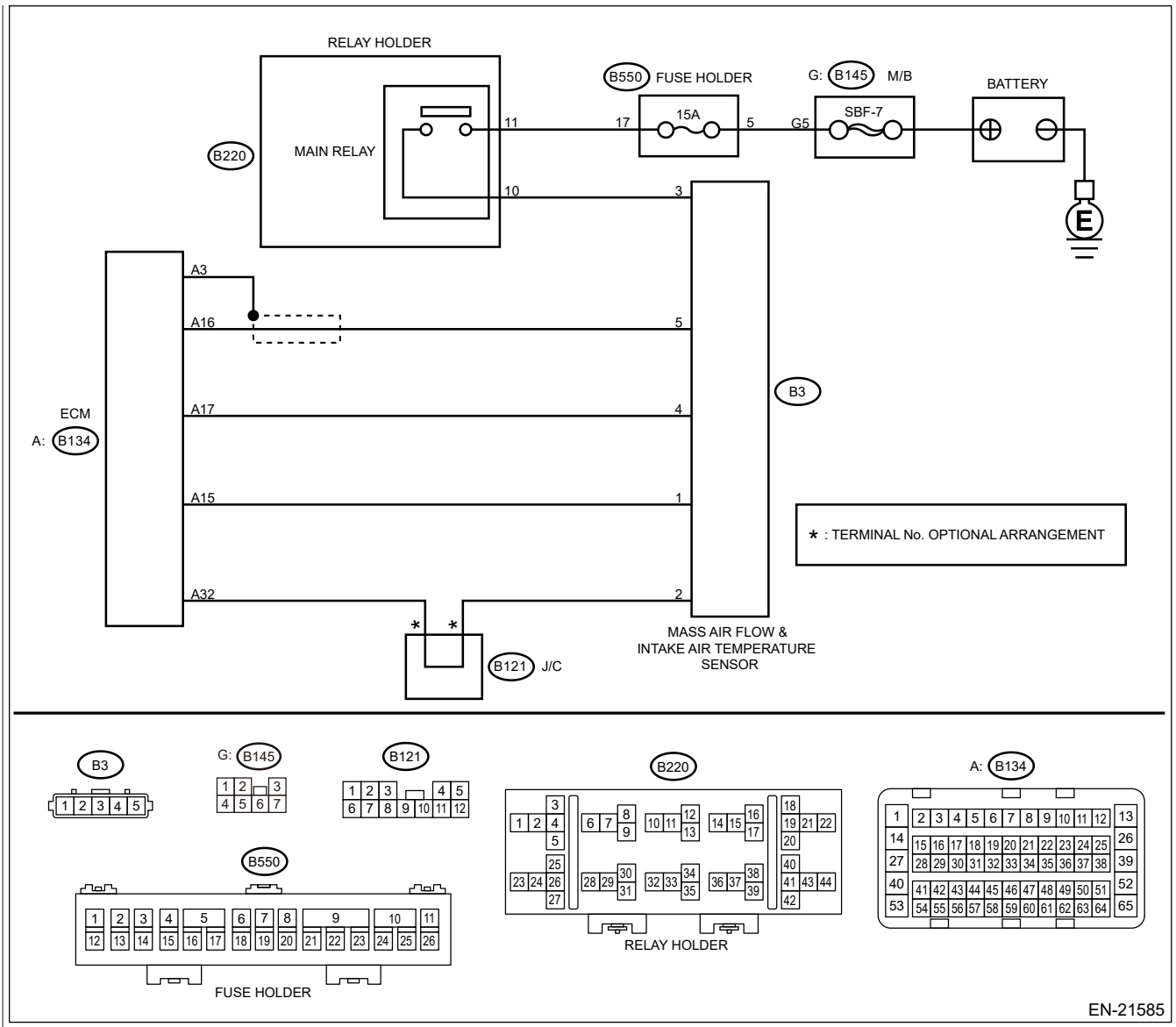
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21585

1. CHECK DATA MONITOR.



1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Air Flow Sensor Voltage].

Note:

For detailed procedures, refer to "Data Monitor". **Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Subaru Select Monitor.**

Is the value of [Air Flow Sensor Voltage] 5 V or more?

Yes

[Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the mass air flow and intake air temperature sensor.
3. Start the engine.
4. Using the Subaru Select Monitor, read the value in [Air Flow Sensor Voltage].

Note:

For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)

Is the value of [Air Flow Sensor Voltage] 5 V or more?

Yes

Repair the short circuit of harness to power supply between ECM connector and the mass air flow and intake air temperature sensor connector.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between mass air flow and intake air temperature sensor connector and engine ground.

Connector & terminal

(B3) No. 4 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- Open circuit in harness between ECM connector and the mass air flow and intake air temperature sensor connector
- Poor contact of ECM connector

4. CHECK FOR POOR CONTACT.


Check for poor contact of mass air flow and intake air temperature sensor connector.

Is there poor contact of mass air flow and intake air temperature sensor connector?

Yes

Repair the poor contact of mass air flow and intake air temperature sensor connector.

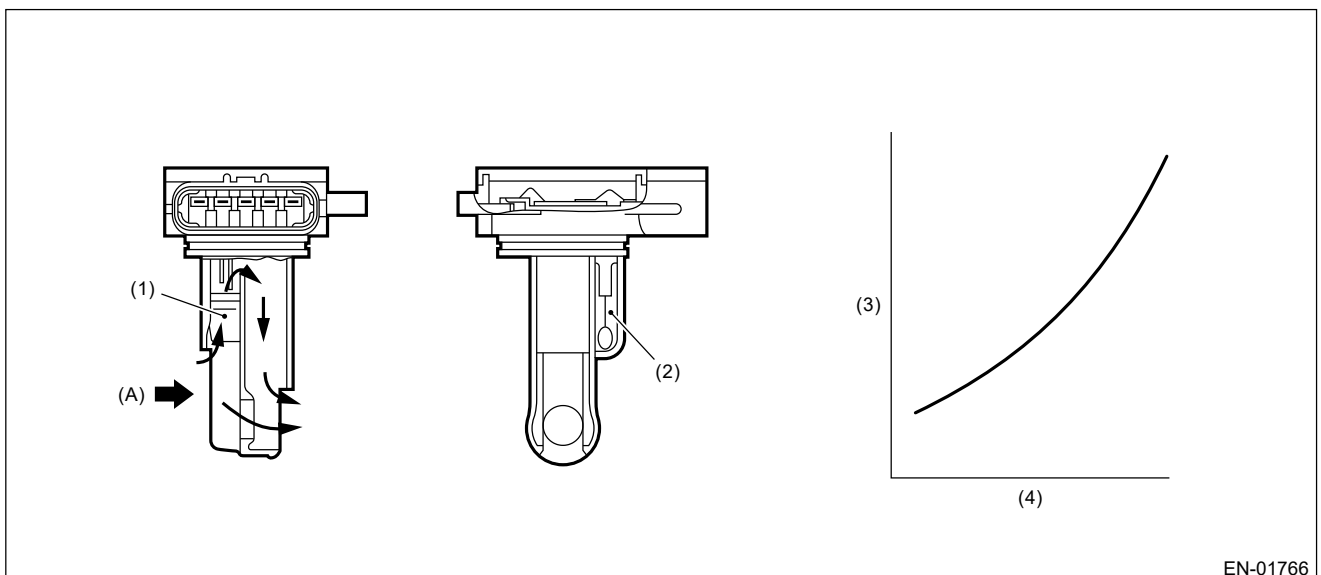
No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DQ\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect open or short circuits of the air flow sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-01766

(A) Air

(1) Air flow sensor

(3) Voltage (V)

(4) Amount of intake air (kg (lb)/s)

(2) Intake air temperature sensor

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$\geq 4.441V$

Time needed for diagnosis: 500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0107 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT LOW

DTC detecting condition:

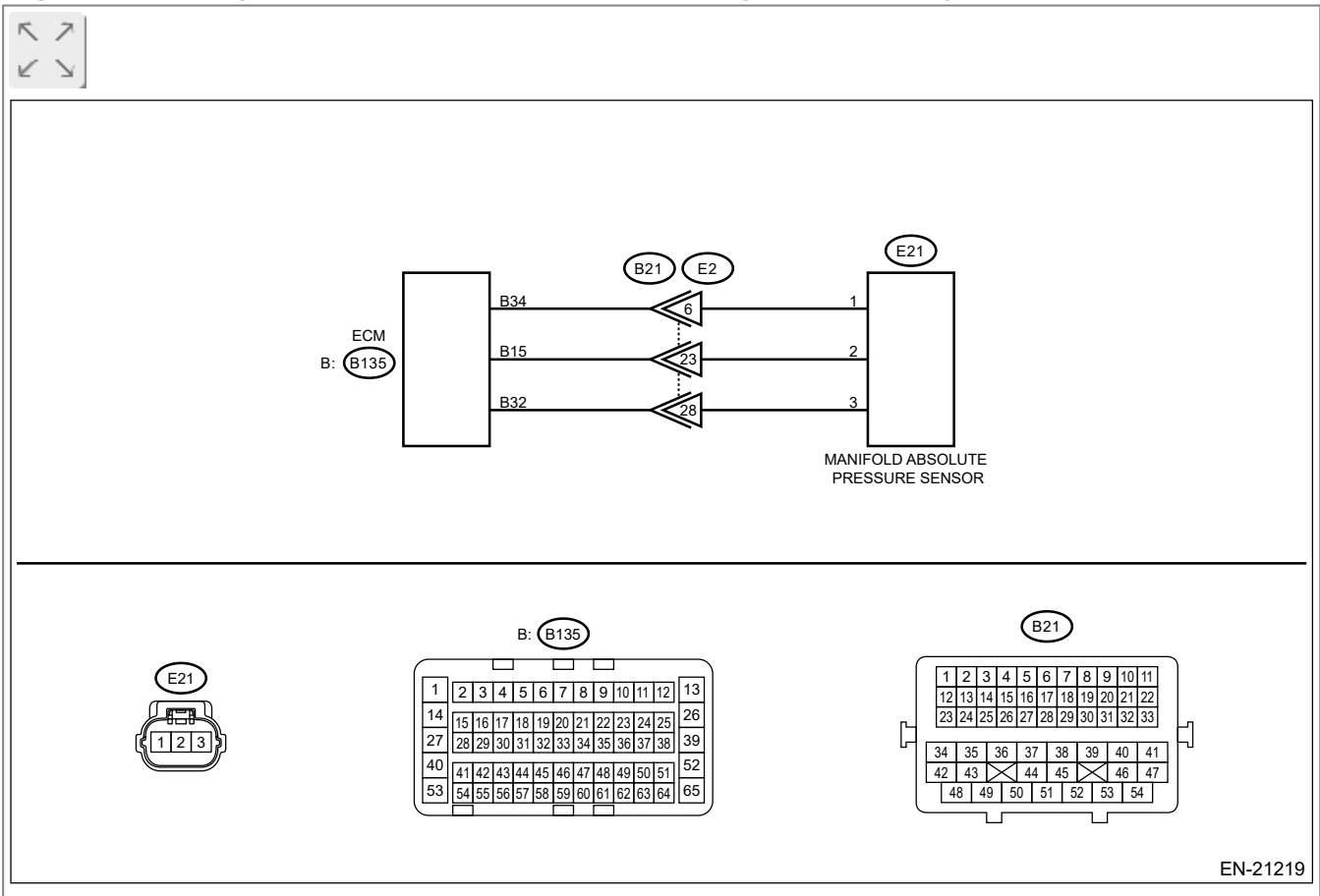
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



EN-21219

1. CHECK CURRENT DATA.

1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Mani. Absolute Pressure].

Note:

- Subaru Select Monitor


For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)

- **General scan tool**

For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Mani. Absolute Pressure] less than 13.3 kPa (100 mmHg, 3.94 inHg)?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK POWER SUPPLY OF MANIFOLD ABSOLUTE PRESSURE SENSOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from manifold absolute pressure sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between manifold absolute pressure sensor connector and engine ground.

Connector & terminal

(E21) No. 3 (+) — Engine ground (-):

Is the voltage 4.5 V or more?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and manifold absolute pressure sensor connector**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.


3. Measure the resistance of harness between ECM connector and manifold absolute pressure sensor connector.

Connector & terminal

(B135) No. 15 — (E21) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and manifold absolute pressure sensor connector**
- **Poor contact of coupling connector**

4. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.




Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B135) No. 15 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair short circuit to ground in harness between ECM connector and manifold absolute pressure sensor connector.

5. CHECK FOR POOR CONTACT.




Check for poor contact of ECM and manifold absolute pressure sensor connector.

Is there poor contact of ECM or manifold absolute pressure sensor connector?

Yes

Repair the poor contact of ECM or manifold absolute pressure sensor connector.

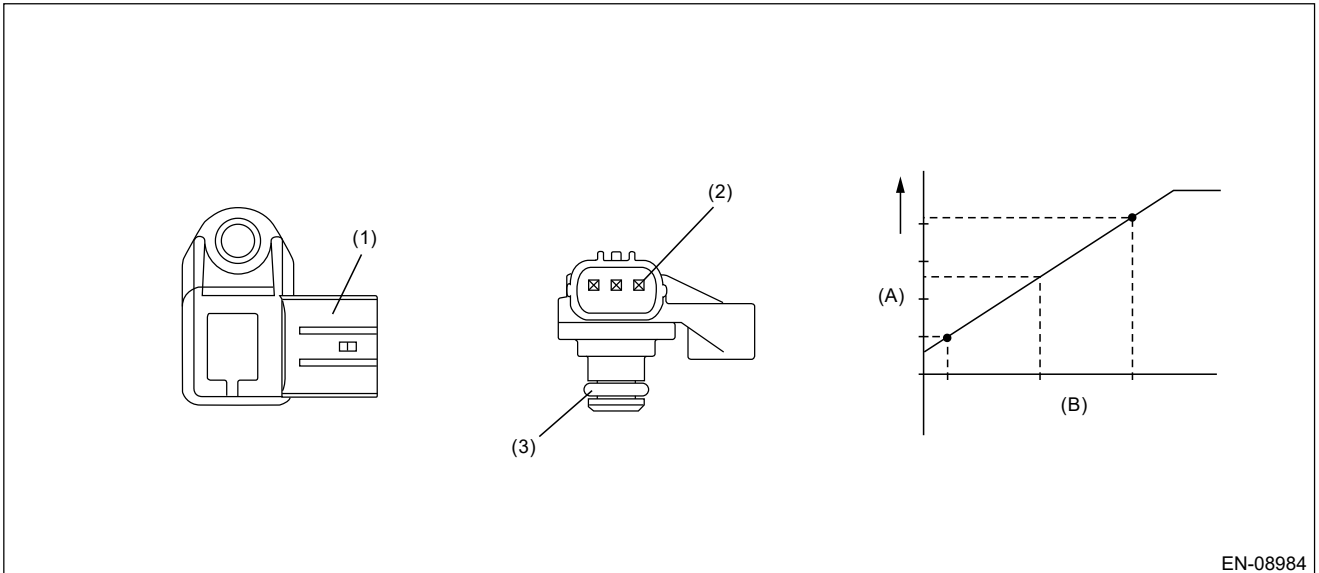
No

Replace the manifold absolute pressure sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Manifold Absolute Pressure Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of intake manifold pressure sensor.
 Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(A) Output voltage

(B) Absolute pressure

(1) Connector

(2) Terminals

(3) O-ring

EN-08984

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	< 0.608V

Time needed for diagnosis: 2000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0108 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT HIGH

DTC detecting condition:

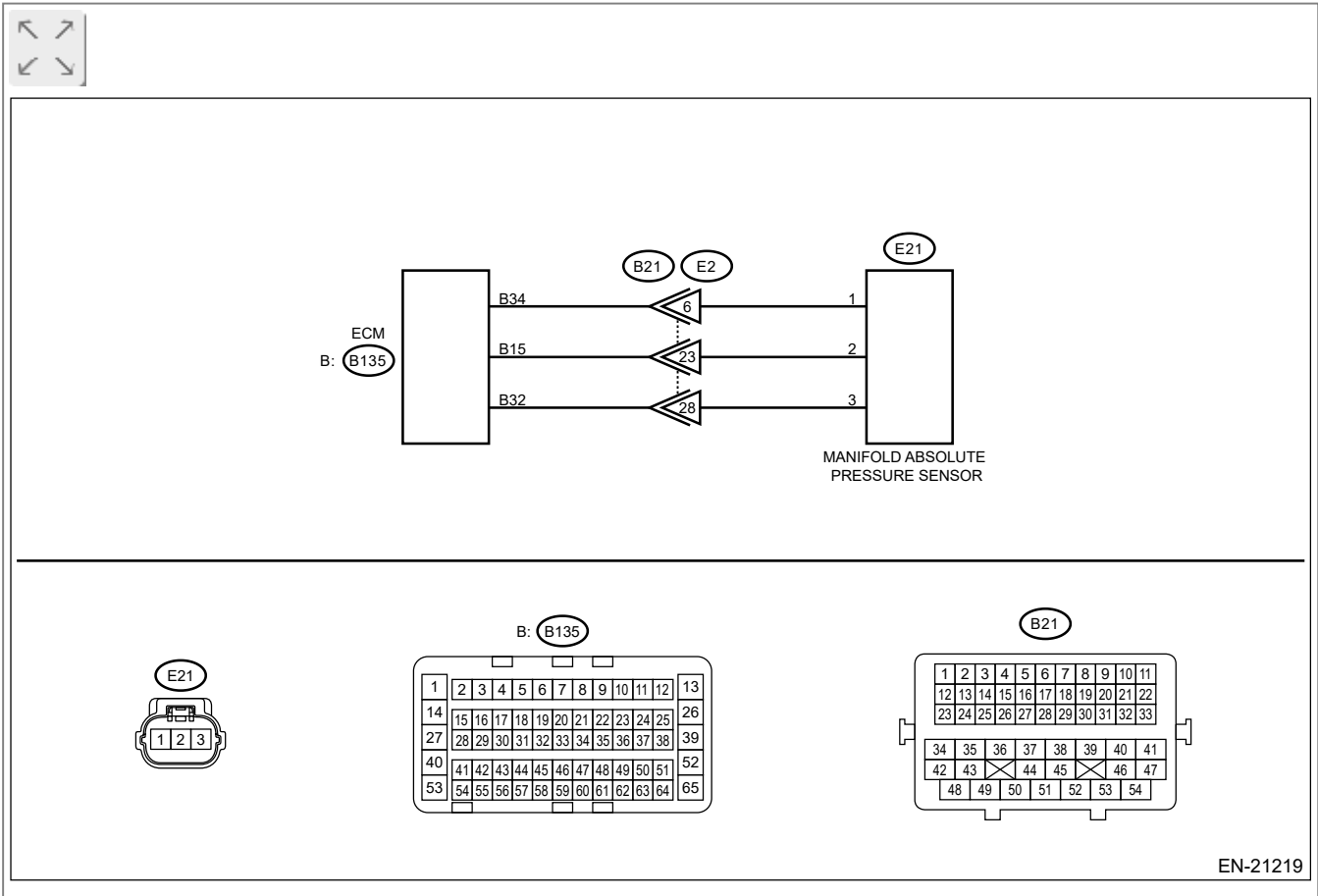
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK CURRENT DATA.

1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Mani. Absolute Pressure].

Note:

- Subaru Select Monitor


For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)

- **General scan tool**

For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Mani. Absolute Pressure] 119.5 kPa (896.5 mmHg, 35.29 inHg) or more?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from manifold absolute pressure sensor.
3. Start the engine.
4. Using the Subaru Select Monitor or a general scan tool, read the value of [Mani. Absolute Pressure].

Note:

- **Subaru Select Monitor**

For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)

- **General scan tool**

For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Mani. Absolute Pressure] 119.5 kPa (896.5 mmHg, 35.29 inHg) or more?

Yes

Repair the short circuit to power in harness between ECM connector and manifold absolute pressure sensor connector.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between manifold absolute pressure sensor connector


and engine ground.

Connector & terminal

(E21) No. 1 – Engine ground:

Is the resistance less than 5 Ω?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and manifold absolute pressure sensor connector**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

4. CHECK FOR POOR CONTACT.




Check for poor contact of manifold absolute pressure sensor connector.

Is there poor contact of manifold absolute pressure sensor connector?

Yes

Repair the poor contact of manifold absolute pressure sensor connector.

No

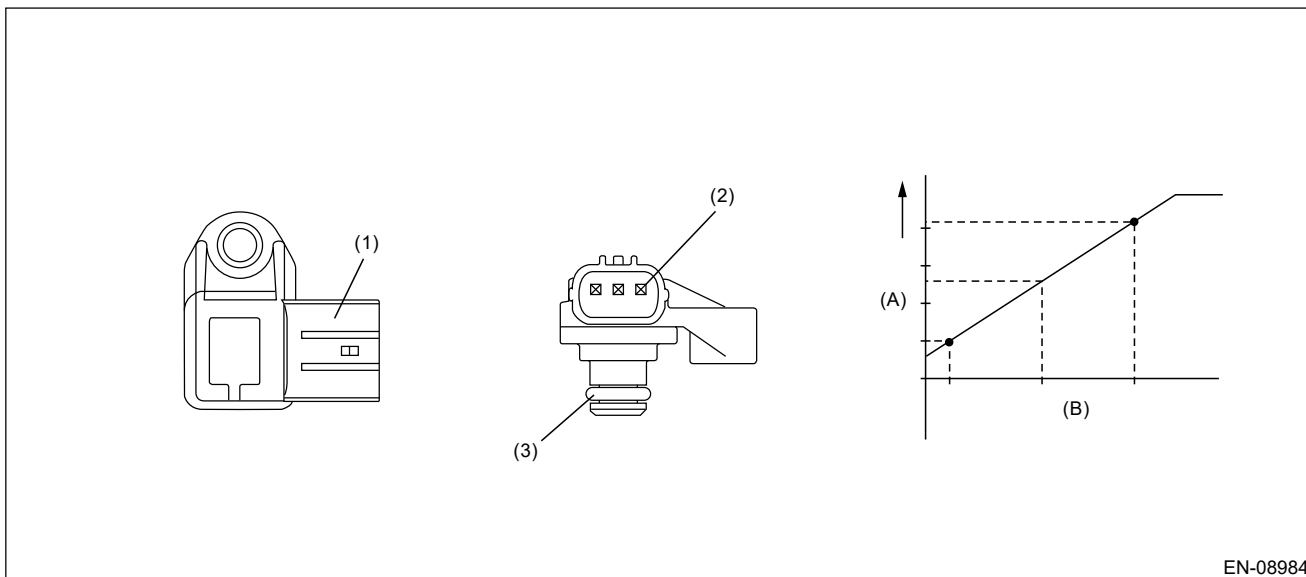
Replace the manifold absolute pressure sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Manifold Absolute Pressure Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of intake manifold pressure sensor.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-08984

(A) Output voltage

(B) Absolute pressure

(1) Connector

(2) Terminals

(3) O-ring

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$\geq 3.906V$

Time needed for diagnosis: 2000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0111 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE BANK 1



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Improper idling
- Poor driving performance

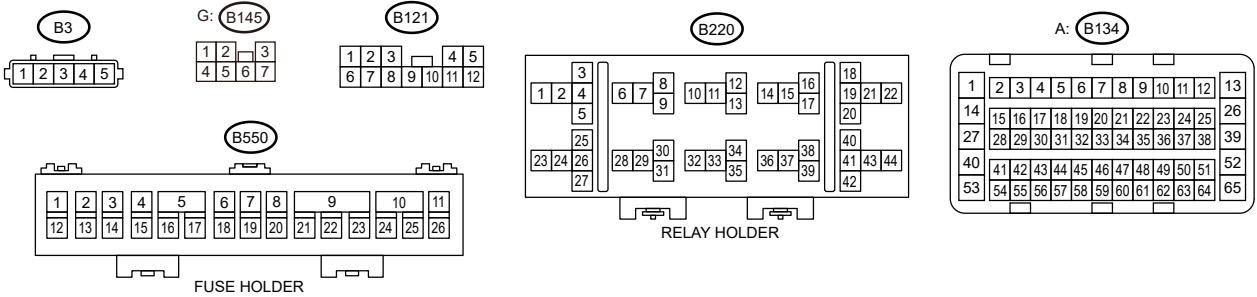
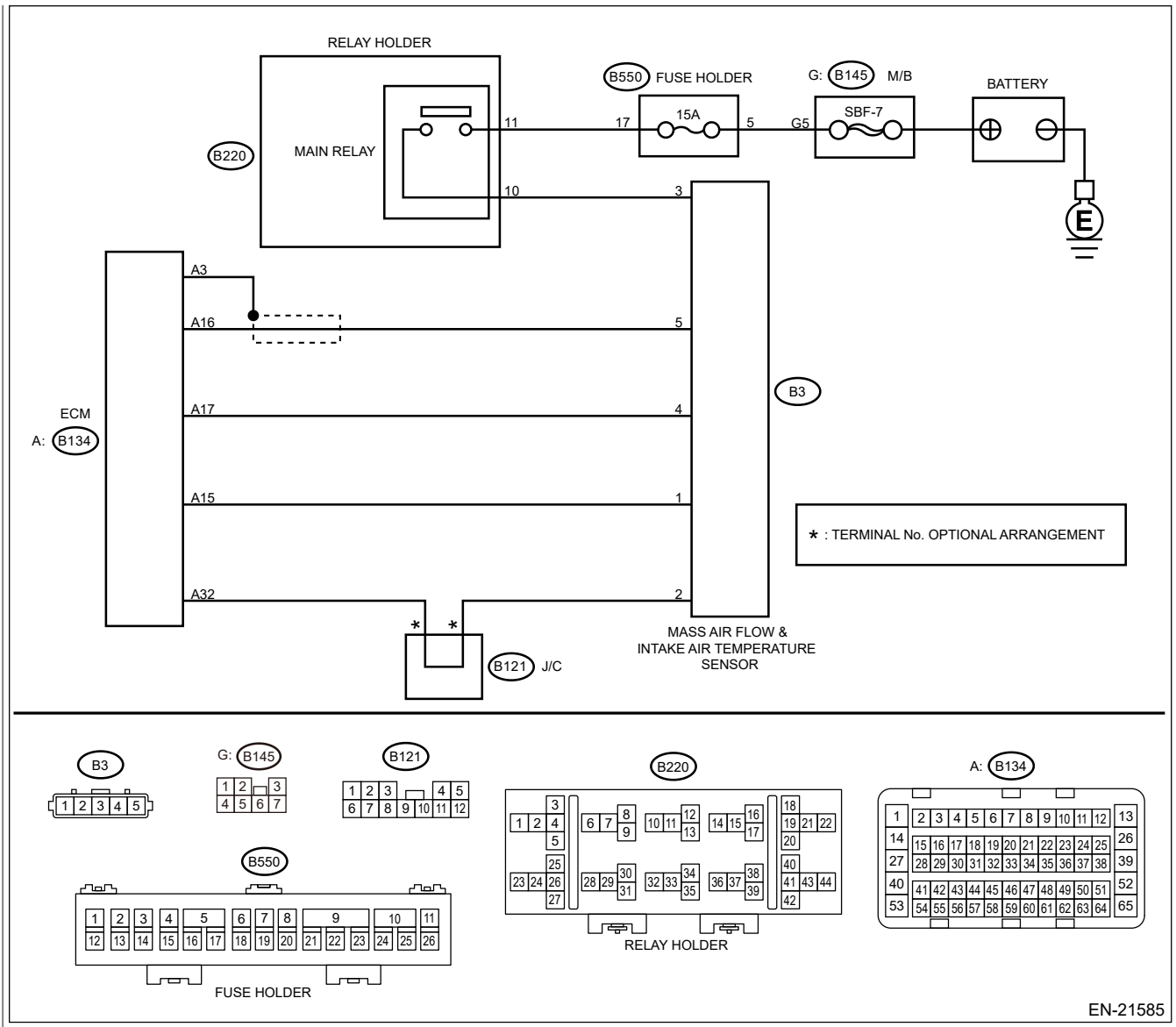
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21585

1. CHECK FOR ANY OTHER DTC ON DISPLAY.



Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".
[Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 2.](#)

2. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.



1. Disconnect the connectors from the mass air flow and intake air temperature sensor.
2. Measure the resistance between the mass air flow and intake air temperature sensor terminals when the engine is cold and after warmed up.

Terminals


No. 1 —No. 2:

Is the resistance of the mass air flow and intake air temperature sensor different between when engine is cold and after warmed up?

Yes

Repair the poor contact of ECM connector.

No

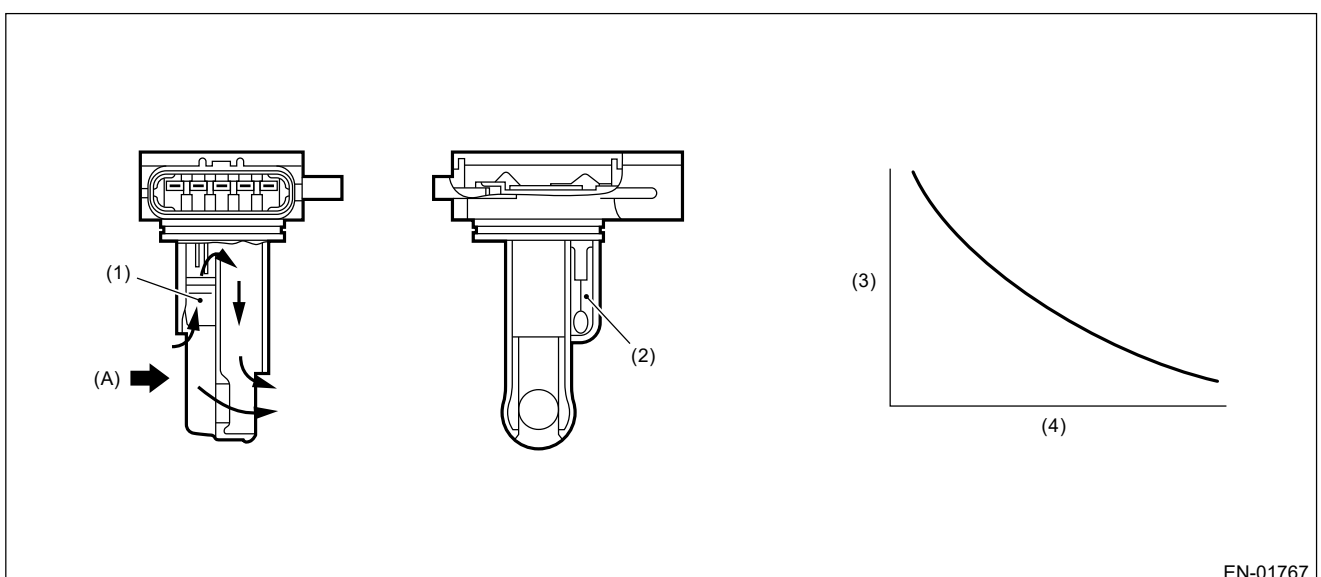
Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of the intake air temperature sensor output properties. Using the following two diagnoses, judge as NG when either is NG.

- **Diagnosis 1 (correlation diagnosis):** After the engine starts after the specified period of soaking time has elapsed, diagnose by correlation between intake air temperature sensor value, engine coolant temperature sensor value and ambient temperature sensor value. Judge as NG when the differences are both above the specified value by comparing between intake air temperature and engine coolant temperature, intake air temperature and ambient air temperature.
- **Diagnosis 2 (stuck diagnosis):** Judge as NG when intake air temperature does not change under the driving condition where it should change, considering engine condition.

2. COMPONENT DESCRIPTION



(A) Air

(1) Air flow sensor

(3) Resistance value (Ω)

(4) Intake air temperature $^{\circ}\text{C}$ ($^{\circ}\text{F}$)

EN-01767

(2) Intake air temperature sensor

3. EXECUTION CONDITION

• DIAGNOSIS 1

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Soaking time	≥ 21600s
Block heater judgment	Completed
Block heater operation	Not in operation

• DIAGNOSIS 2

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Engine coolant temperature	≥ 60°C (140°F)
Integrated value of intake air amount	≥ Value of Map 1
Number of experiences under following driving conditions	≥ 3time(s)
• Duration of driving condition 1	≥ 15s
Vehicle speed	≥ 40km/h (24.9MPH)
and	
Amount of intake air	≥ 10g/s (0.35oz/s)
• Duration of driving condition 2	≥ Map 2
Vehicle speed	< 4 km/h (2.5 MPH)

Map 1

Engine coolant temperature °C (°F)	-30 (-22)	-10 (14)	0 (32)	10 (50)	25 (77)
Intake air amount sum value (g (oz))	30500 (1075.74)	24000 (846.48)	20500 (723.04)	15000 (529.05)	5500 (193.99)

Map 2

Engine coolant temperature °C (°F)	-30 (-22)	0 (32)	10 (50)	25 (77)
Duration of driving condition 2 (s)	250	40	32	15

4. GENERAL DRIVING CYCLE

- **Diagnosis 1:** Perform the diagnosis only once after the engine starts after a certain period of soaking time.
- **Diagnosis 2:** Perform the diagnosis when the vehicle speed condition is met after warming up from a cold condition.

5. DIAGNOSTIC METHOD

Judge as NG when Diagnosis 1 or Diagnosis 2 becomes NG.

Diagnosis 1

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Intake air temperature 30 sec. after engine start – Engine coolant temperature at engine start	> Value of Map 3
Intake air temperature 30 sec. after engine start – Ambient air temperature 30 sec. after engine start	> Value of Map 4

Map 3

Ambient temperature °C (°F)	-30 (-22)	30 (86)	45 (113)	60 (140)
Intake air temperature 30 sec. after engine start – Engine coolant temperature at engine start °C (°F)	12 (21.6)	12 (21.6)	22 (39.6)	22 (39.6)

Map 4

Ambient temperature °C (°F)	-30 (-22)	30 (86)	45 (113)	60 (140)
Intake air temperature 30 sec. after engine start – Ambient air temperature 30 sec. after engine start °C (°F)	20 (36)	20 (36)	32 (57.6)	32 (57.6)

Time needed for diagnosis: Less than 1 second

Diagnosis 2

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage difference between Max. and Min.	< 0.02V (Equivalent to approximately

0.5°C (0.9°F) near 25°C (77°F)

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0112 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW BANK 1



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

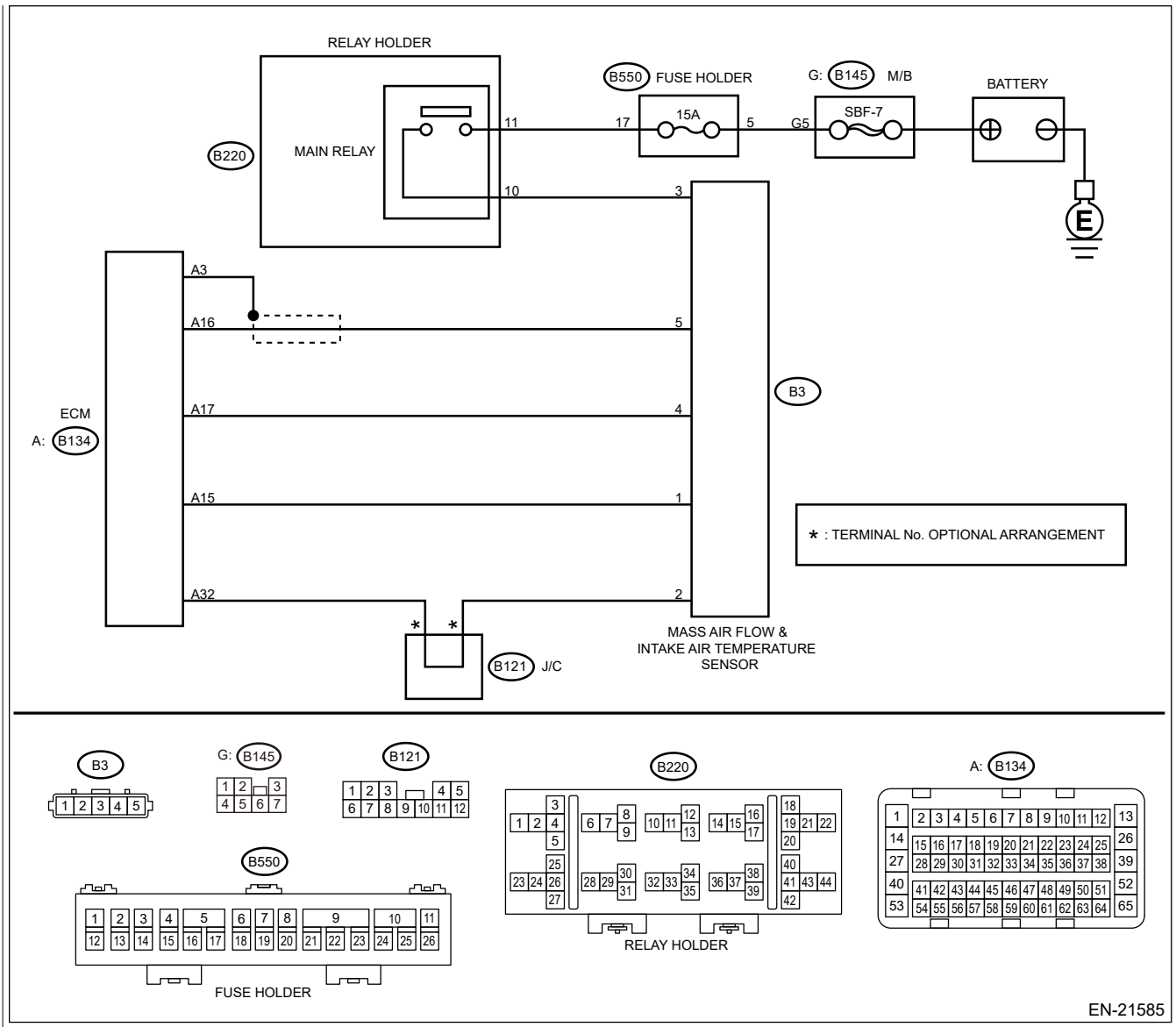
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





1. CHECK CURRENT DATA.


1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Intake Air Temp.].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Intake Air Temp.] 120°C (248°F) or more?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the mass air flow and intake air temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 15 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

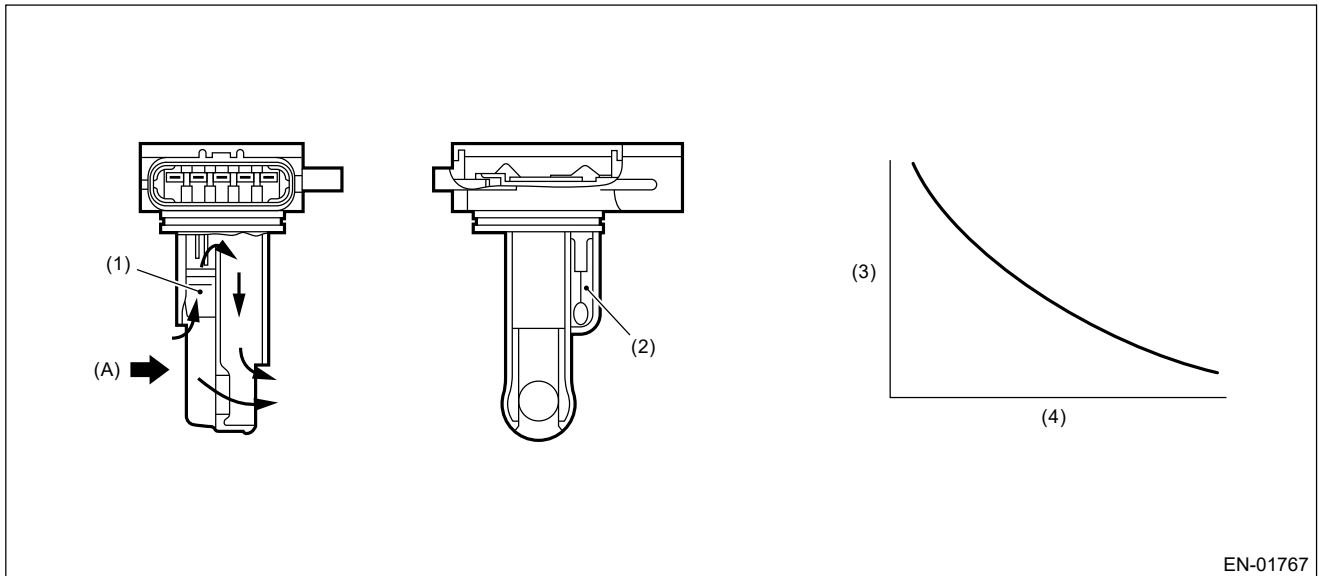
No

Repair the ground short circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of the intake air temperature sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-01767

(A) Air

(1) Air flow sensor

(3) Resistance value (Ω)

(4) Intake air temperature $^{\circ}\text{C}$ ($^{\circ}\text{F}$)

(2) Intake air temperature sensor

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	< 0.4V

Time needed for diagnosis: 500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0113 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH BANK 1



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

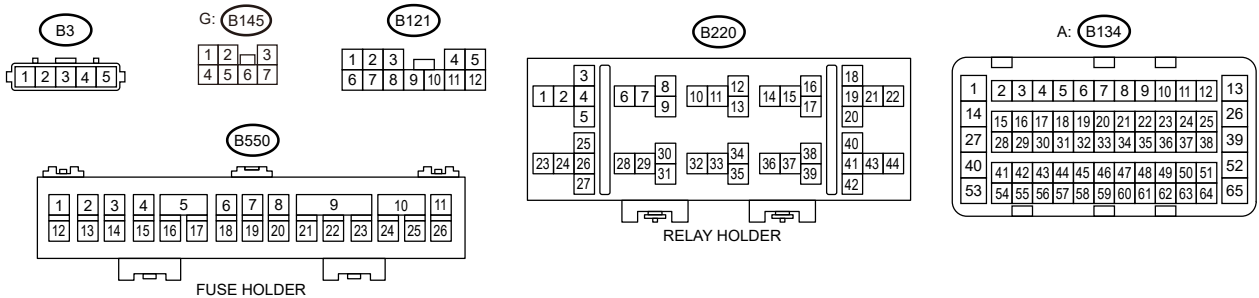
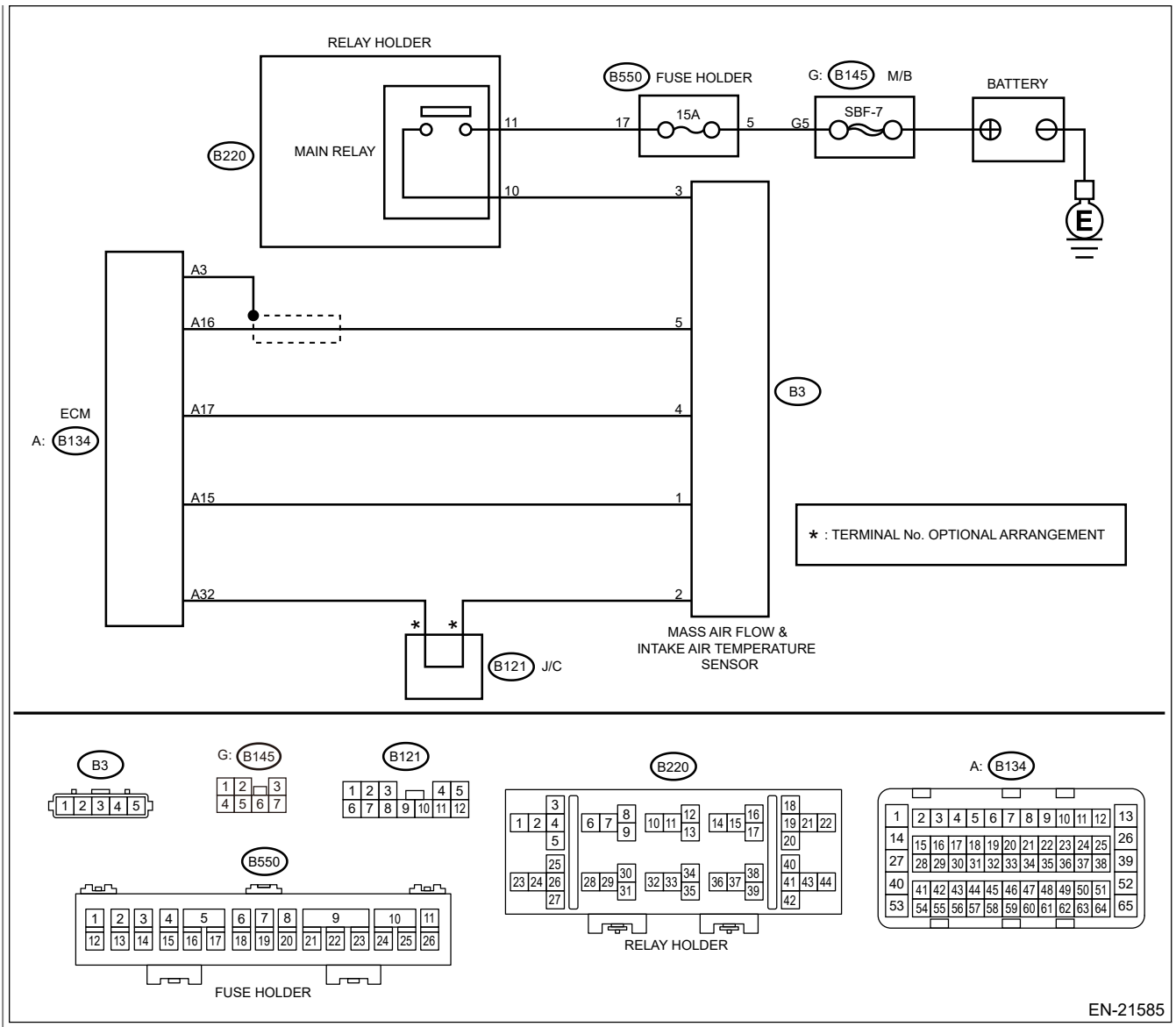
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21585

1. CHECK CURRENT DATA.



1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Intake Air Temp.].


Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Intake Air Temp.] -40°C (-40°F) or less?



Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM and mass air flow and intake air temperature sensor connector.

Is there poor contact of ECM or mass air flow and intake air temperature sensor connector?

Yes

Repair the poor contact of ECM or mass air flow and intake air temperature sensor connector.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the mass air flow and intake air temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

Connector & terminal

(B134) No. 15 — (B3) No. 1:

(B134) No. 32 — (B3) No. 2:

Is the resistance less than 1 Ω?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and the mass air flow and intake air temperature sensor connector**
- **Poor contact of joint connector**

4. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.



1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal


(B134) No. 15 (+) — Chassis ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit of harness to power supply between ECM connector and the mass air flow and intake air temperature sensor connector.

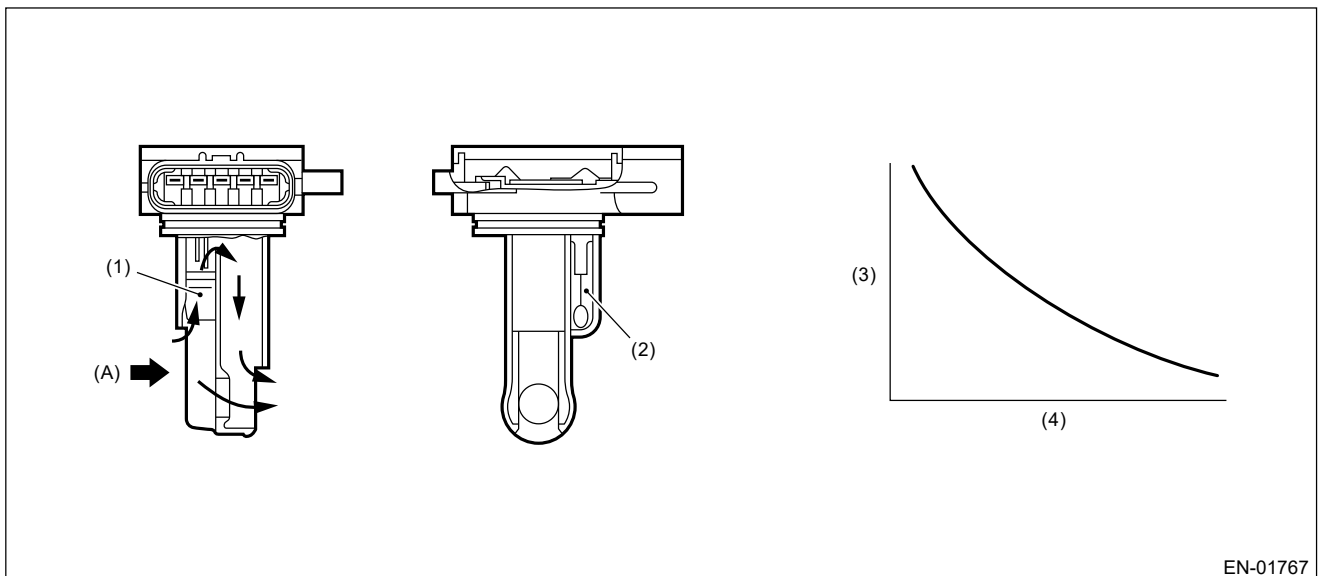
No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of the intake air temperature sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(A) Air

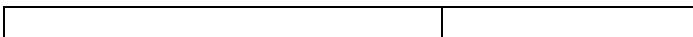
(1) Air flow sensor

(3) Resistance value (Ω)

(4) Intake air temperature $^{\circ}\text{C}$ ($^{\circ}\text{F}$)

(2) Intake air temperature sensor

3. EXECUTION CONDITION



Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$\geq 4.707V$

Time needed for diagnosis: 500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0116 ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

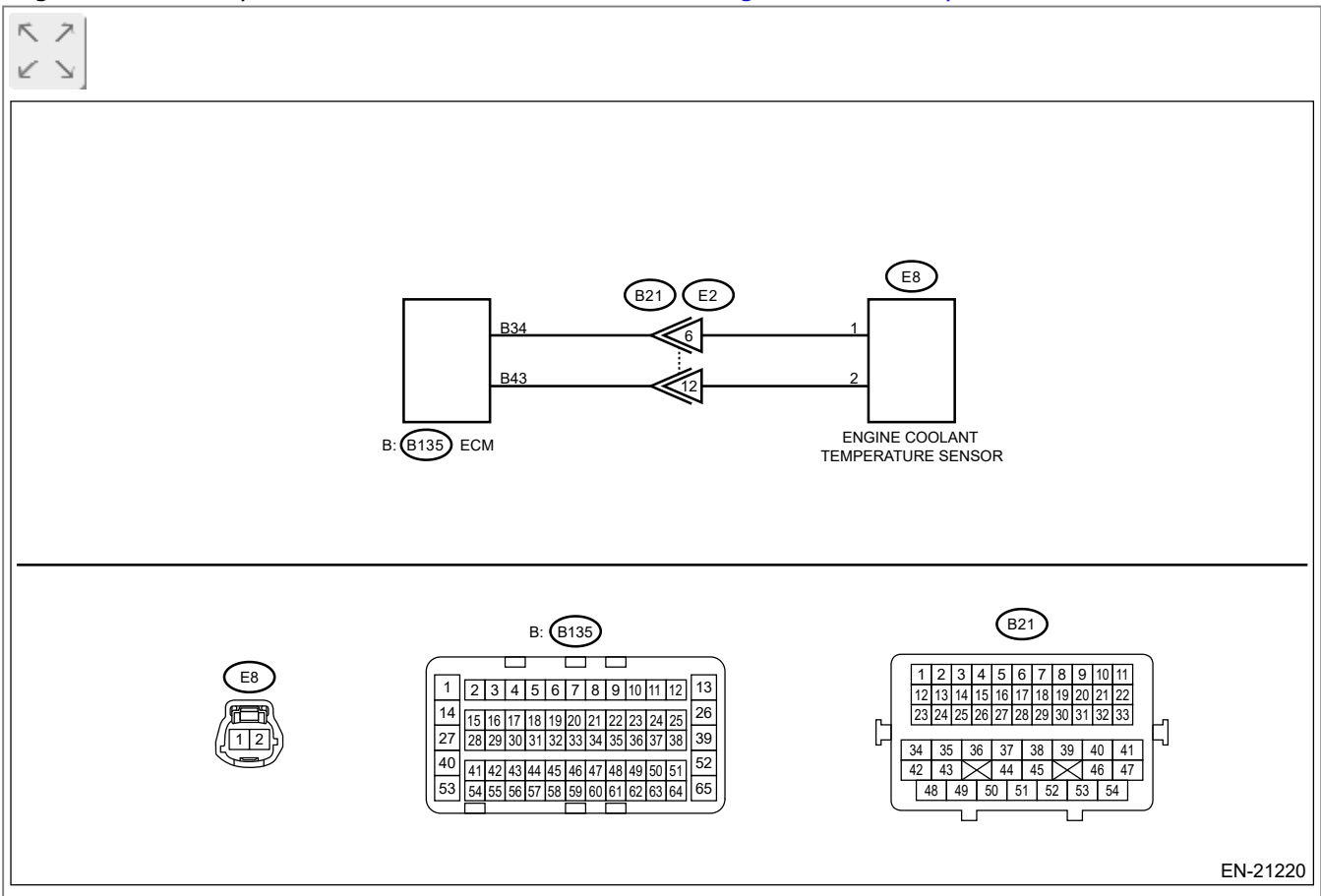
- Hard to start
- Improper idling
- Poor driving performance

Caution:

- After servicing or replacing faulty parts, perform Clear Memory Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)




EN-21220

1. CHECK FOR ANY OTHER DTC ON DISPLAY.




Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 2.](#)

2. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

1. Disconnect the connectors from the engine coolant temperature sensor.
2. Measure the resistance between engine coolant temperature sensor terminals when the engine coolant is cold and after warmed up.

Terminals


No. 1 —No. 2:

Is the resistance of engine coolant temperature sensor different between when engine coolant is cold and after warmed up?

Yes

Repair the poor contact of ECM connector.

No

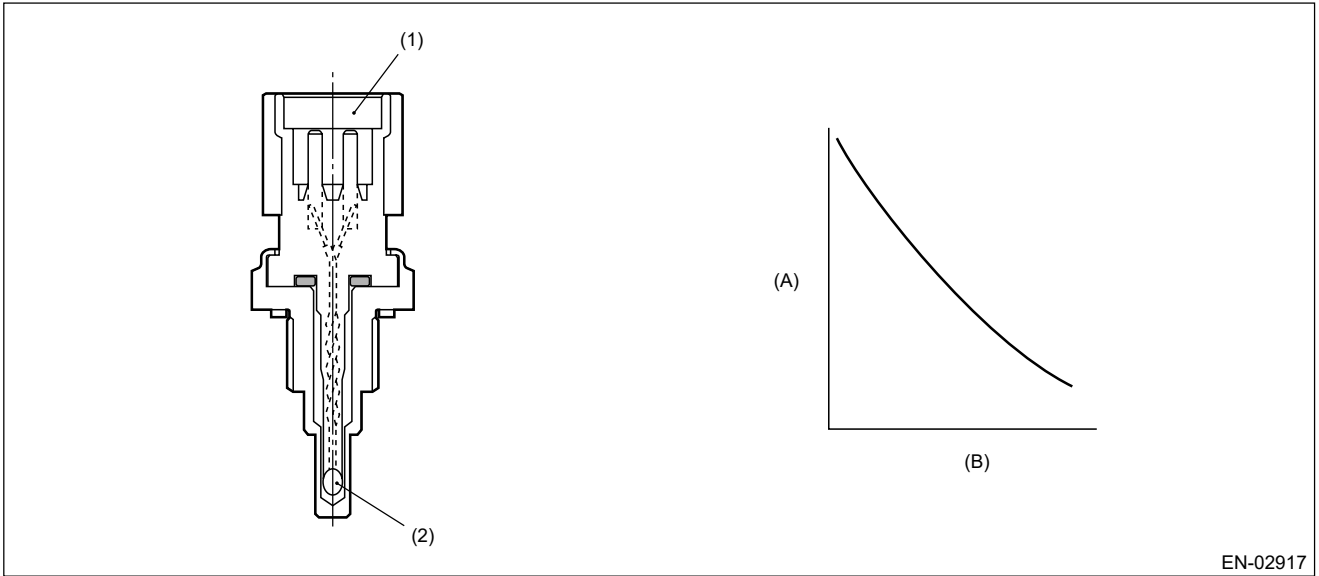
Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Coolant Temperature Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of the engine coolant temperature sensor characteristics.

After the engine starts after the specified period of soaking time has elapsed, diagnose by correlation between engine coolant temperature sensor value, intake air temperature sensor value and ambient temperature sensor value. Judge as NG when the differences are both above the specified value by comparing between engine coolant temperature and ambient air temperature, engine coolant temperature and intake air temperature.

2. COMPONENT DESCRIPTION



EN-02917

- (A) Resistance value (kΩ)
- (B) Temperature °C (°F)
- (1) Connector
- (2) Thermistor element

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 v
Soaking time	≥ 21600s
Block heater judgment	Completed
Block heater operation	Not in operation

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once after the engine starts after a certain period of soaking time.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Engine coolant temperature at engine start – Intake air temperature 30 sec. after engine start	> Value from Map
Engine coolant temperature at engine start – Ambient air temperature at engine start	> 25°C (77°F)

Map

Ambient temperature °C (°F)	-30 (-22)	30 (86)	45 (113)	60 (140)
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Engine coolant temperature at engine start – Intake air temperature 30 sec. after engine start °C (°F)	12 (21.6)	12 (21.6)	22 (39.6)	22 (39.6)
--	--------------	--------------	--------------	--------------

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0117 ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT LOW



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

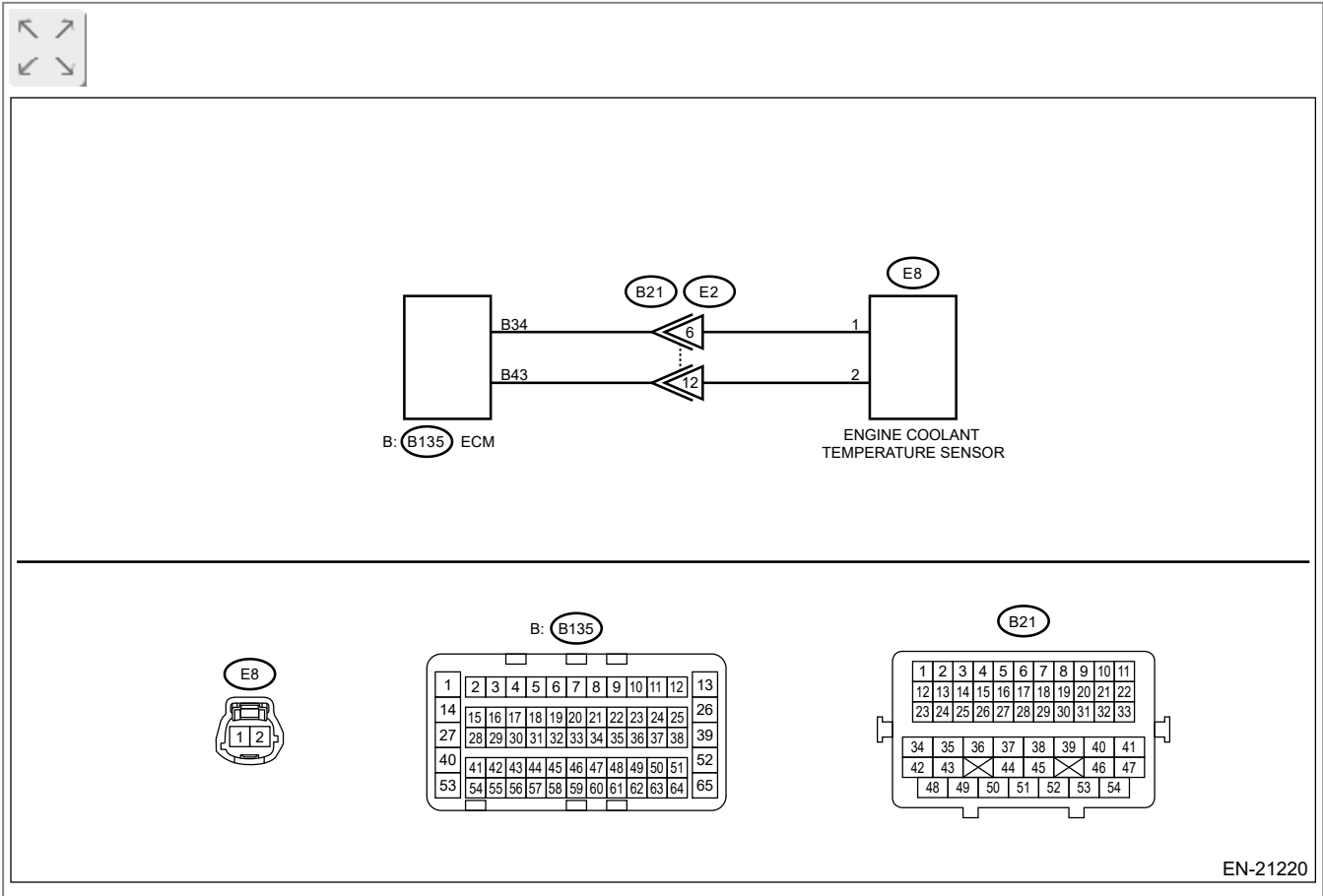
- Hard to start
- Improper idling
- Poor driving performance

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.




EN-21220

1. CHECK CURRENT DATA.

1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Coolant Temp.].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Coolant Temp.] 120°C (248°F) or more?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the engine coolant temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B135) No. 43 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Coolant Temperature Sensor.](#)

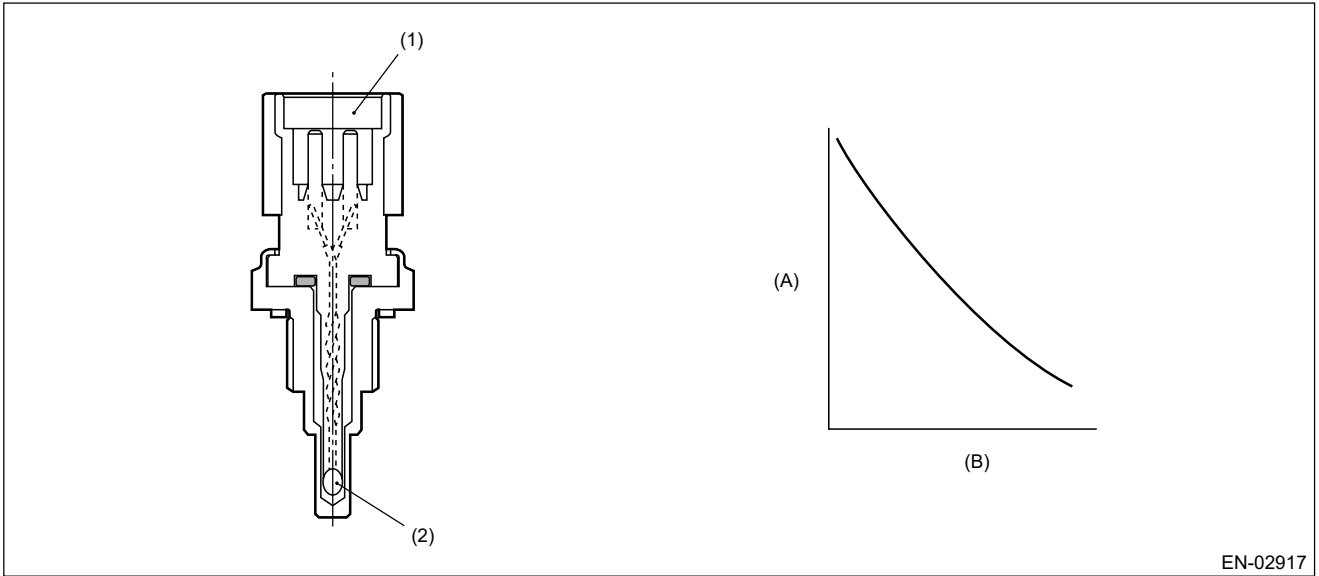
No

Repair the short circuit to ground in harness between ECM connector and engine coolant temperature sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the engine coolant temperature sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-02917

- (A) Resistance value (kΩ)
- (B) Temperature °C (°F)
- (1) Connector
- (2) Thermistor element

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	< 0.349V

Time needed for diagnosis: 500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0118 ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT HIGH



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

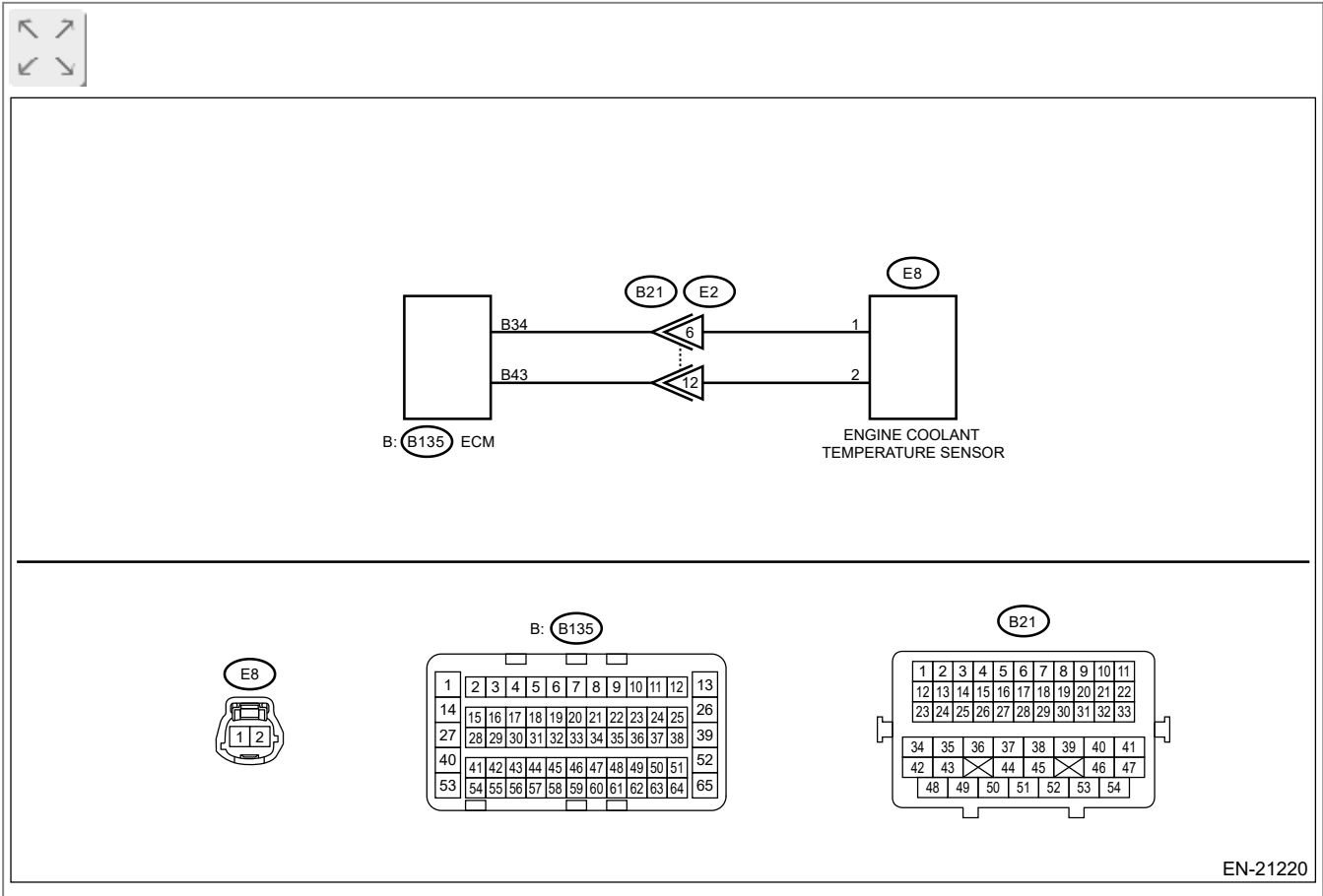
- Hard to start
- Improper idling
- Poor driving performance

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.




EN-21220

1. CHECK CURRENT DATA.




1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Coolant Temp.].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Coolant Temp.] -40°C (-40°F) or less?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM and engine coolant temperature sensor connector.

Is there poor contact of ECM or engine coolant temperature sensor connector?

Yes

Repair the poor contact of ECM or engine coolant temperature sensor connector.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the engine coolant temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and engine coolant temperature sensor connector.

Connector & terminal

(B135) No. 43 — (E8) No. 2:

(B135) No. 34 — (E8) No. 1:

Is the resistance less than $1\ \Omega$?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and engine coolant temperature sensor connector**
- **Poor contact of coupling connector**

4. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.



1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal


(B135) No. 43 (+) — Chassis ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit of harness to power supply between ECM connector and engine coolant temperature sensor connector.

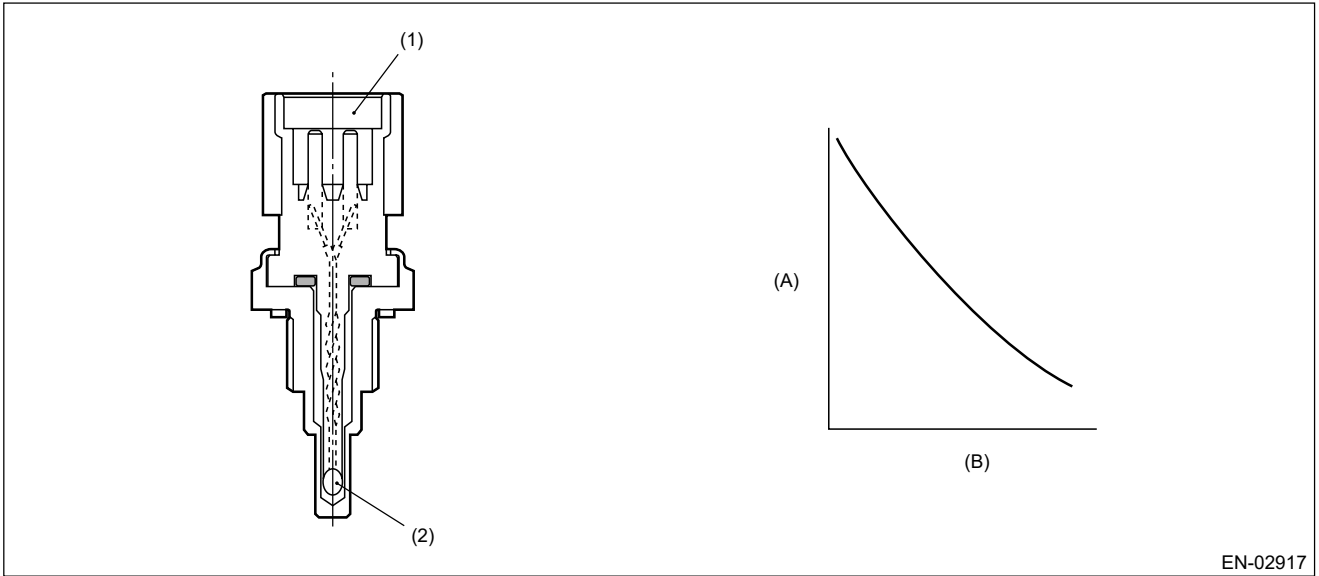
No

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Coolant Temperature Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the engine coolant temperature sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-02917

- (A) Resistance value (kΩ)
- (B) Temperature °C (°F)
- (1) Connector
- (2) Thermistor element

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	≥ 4.698V

Time needed for diagnosis: 500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Engine stalls.
- Poor driving performance

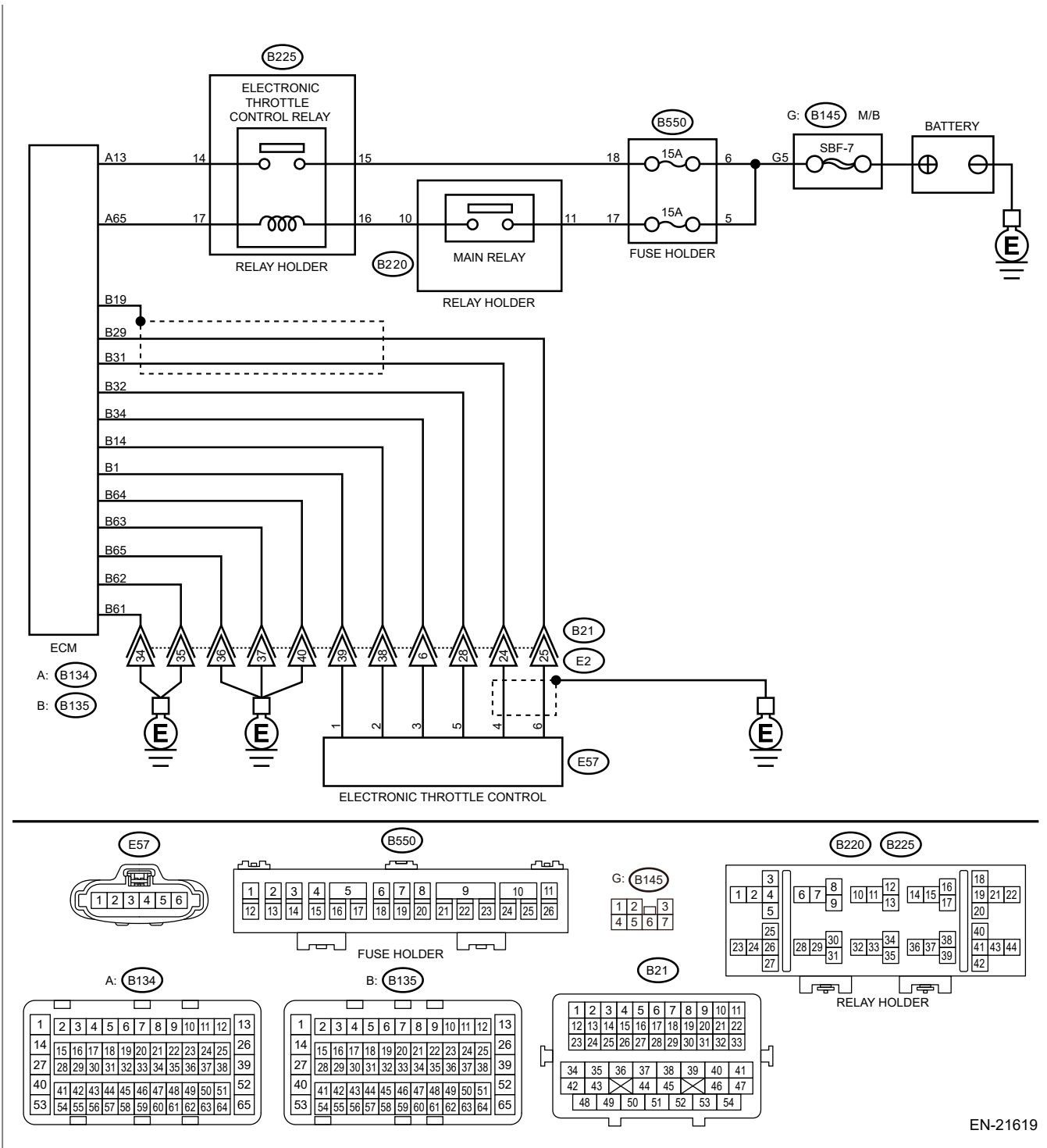
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21619

1. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from electronic throttle control.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM connector and chassis ground.



Connector & terminal


(B135) No. 32 — Chassis ground:

(B135) No. 29 — Chassis ground:

(B135) No. 29 — (B135) No. 19:

Is the resistance 1 MΩ or more?

Yes

 [Go to 2.](#)

No

Repair the ground short circuit of harness between ECM connector and electronic throttle control connector.

2. CHECK SHORT CIRCUIT INSIDE THE ECM.


1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal


(E57) No. 6 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

Replace the electronic throttle control.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Throttle Body.](#)

No

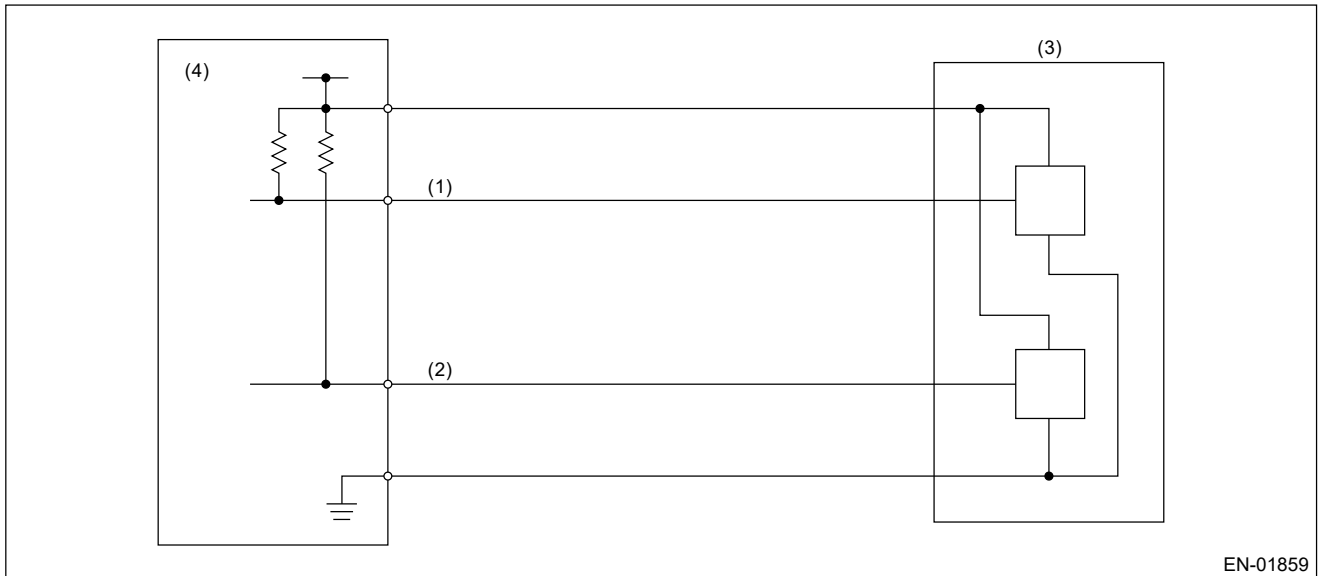
Repair the ground short circuit of harness between ECM connector and electronic throttle control connector. Replace the ECM if defective.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of throttle position sensor 1.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-01859

- (1) Throttle position sensor 1 signal (3) Throttle position sensor (4) Engine control module (ECM)
- (2) Throttle position sensor 2 signal

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 6V$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 1 input voltage	$\leq 0.267V$

Time Needed for Diagnosis: 24ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Engine stalls.
- Poor driving performance

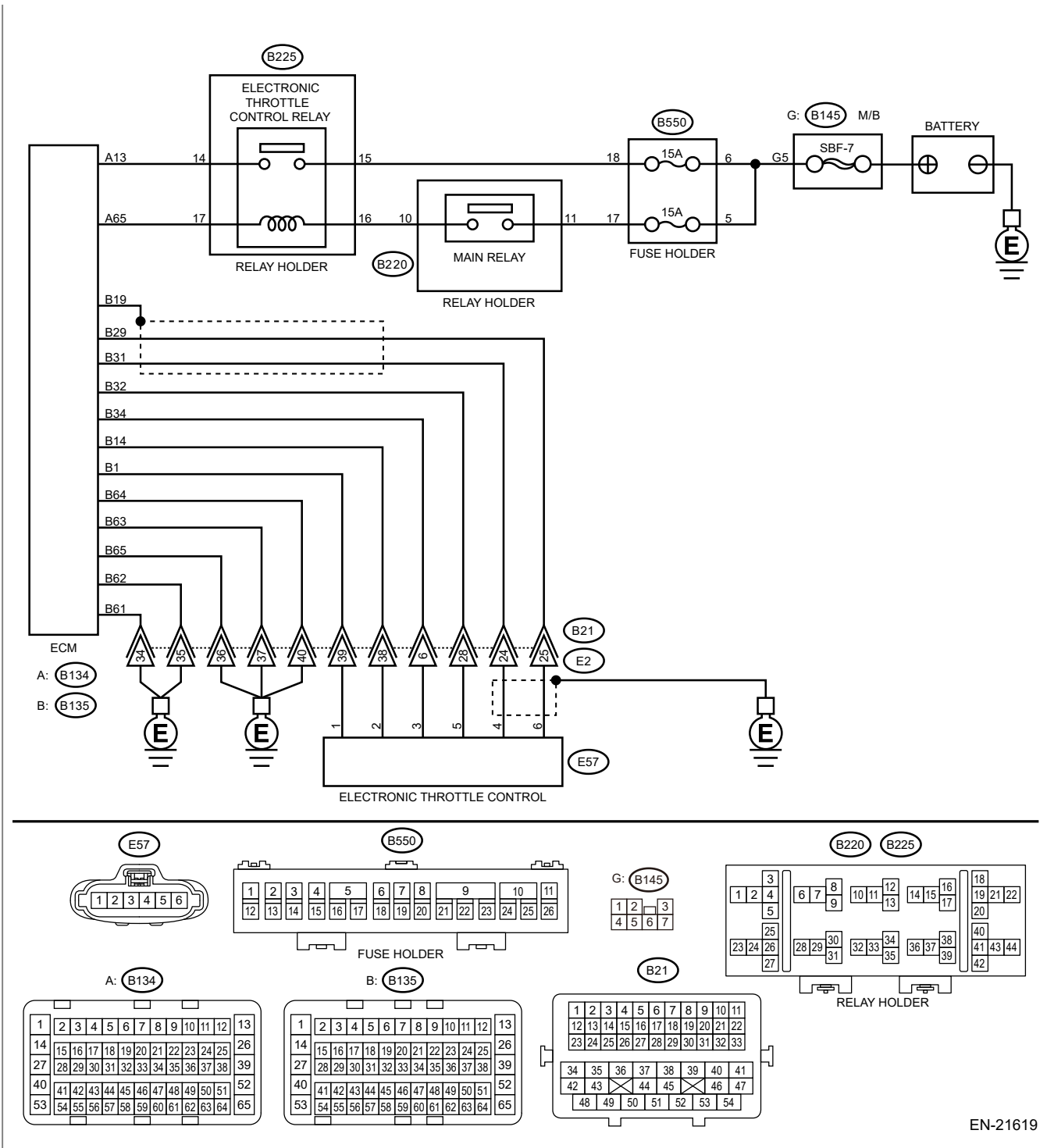
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21619

1. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from electronic throttle control.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and electronic throttle control

connector.


Connector & terminal

(B135) No. 29 — (E57) No. 6:

(B135) No. 34 — (E57) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 2.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and electronic throttle control connector**
- **Poor contact of coupling connector**

2. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 3 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and engine ground**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to ON.
2. Measure the voltage between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 6 (+) — Engine ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in the harness between ECM connector and electronic throttle control connector.

No

 [Go to 4.](#)

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.

Connector & terminal

(B135) No. 32 — (B134) No. 18:

Is the resistance 1 M Ω or more?

Yes

Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Throttle Body.](#)

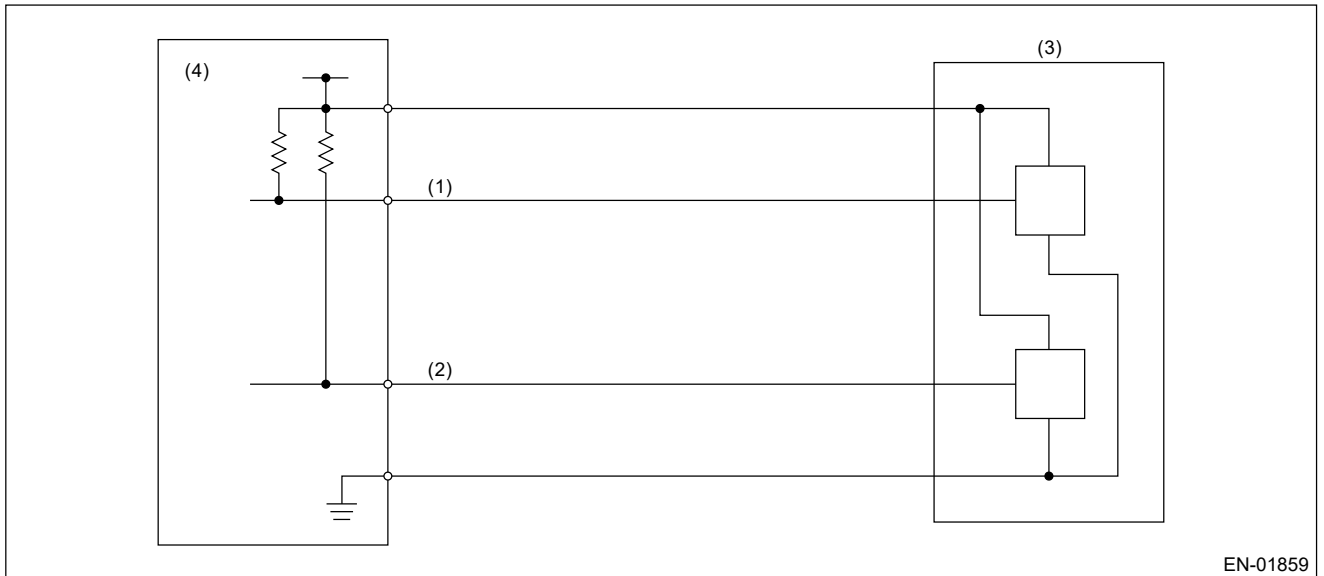
No

Repair the short circuit to power in the harness between ECM connector and electronic throttle control connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of throttle position sensor 1.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-01859

- (1) Throttle position sensor 1 signal (3) Throttle position sensor (4) Engine control module (ECM)
- (2) Throttle position sensor 2 signal

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 6V$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 1 input voltage	$\geq 4.725V$

Time Needed for Diagnosis: 24ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0125 INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

Engine does not return to idle.

Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE..


1. CHECK ENGINE COOLANT.

Check the following items:


- Amount of engine coolant
- Engine coolant freeze
- Contamination of engine coolant

Is the engine coolant normal?

Yes

 [Go to 2.](#)


No

Fill or replace the engine coolant.  Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT.


2. CHECK THERMOSTAT.

Does the thermostat remain opened?

Yes

Replace the thermostat.  Ref. to COOLING(H4DO)>Thermostat.

No

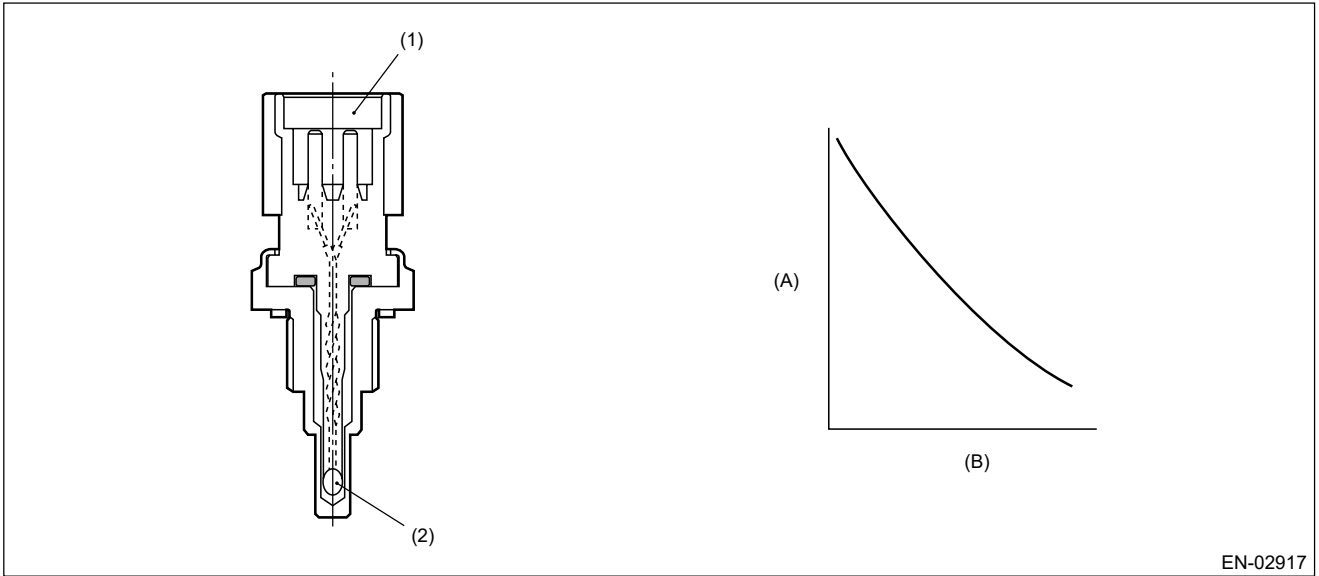
Replace the engine coolant temperature sensor.  Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of engine coolant temperature sensor output property.

Judge as NG when engine coolant temperature does not rise to the specified value after predetermined time has elapsed since engine start.

2. COMPONENT DESCRIPTION



EN-02917

- (A) Resistance value (kΩ)
- (B) Temperature °C (°F)
- (1) Connector
- (2) Thermistor element

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Engine speed	≥ 500 rpm
Engine coolant temperature at engine start	< -15°C (5°F)

4. GENERAL DRIVING CYCLE

Perform the diagnosis at full closed point learning.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Engine coolant temperature	< -15°C (5°F)
Elapsed time after starting the engine	≥ Value from Map
((Smaller value of either engine coolant temperature and intake air temperature at engine start) ≥ -23.3°C (-9.9°F))	
or	
((Smaller value of either engine coolant temperature and intake	

air temperature at engine start) < -23.3°C (-9.9°F)	
--	--

Map

		Smaller value either one of engine coolant temperature and intake air temperature at engine start °C (°F)							
		-40 (-40)	-23.4 (-10.1)	-23.3 (-9.9)	0 (32)	20 (68)	40 (104)	60 (140)	80 (176)
Percentage of time when engine is at stop against time elapsed since engine start	0.0	30000 0	30000 0	12000 0	12000 0	12000 0	12000 0	12000 0	12000 0
	0.3	30000 0	30000 0	12000 0	12000 0	12000 0	12000 0	12000 0	12000 0
	0.6	30000 0	30000 0	12000 0	12000 0	12000 0	12000 0	12000 0	12000 0
	1.0	30000 0	30000 0	12000 0	12000 0	12000 0	12000 0	12000 0	12000 0
ms									

Time needed for diagnosis: 120 or 300 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0131 A/F / O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 1

DTC detecting condition:

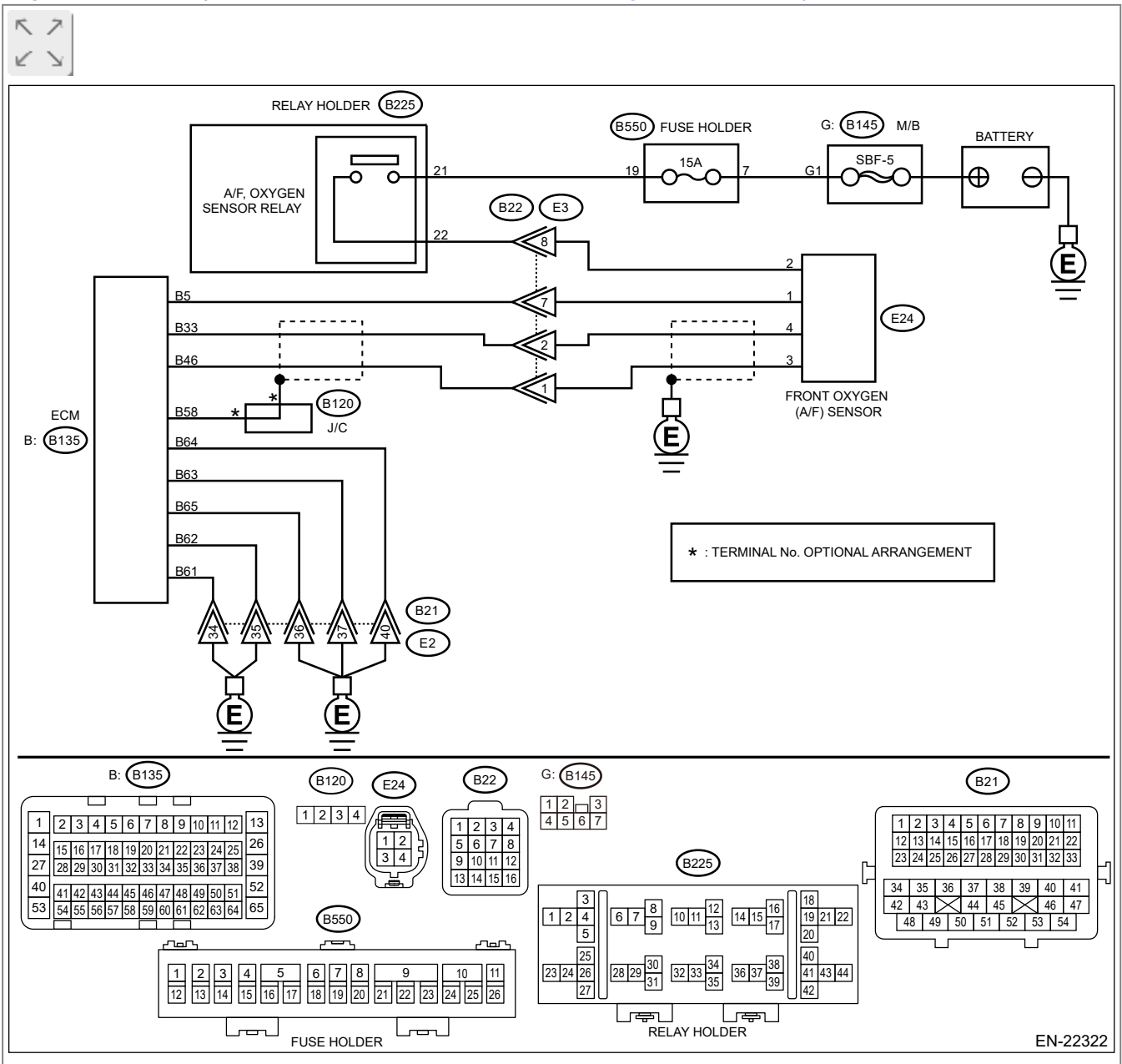
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.




Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B135) No. 33 — Chassis ground:

(B135) No. 46 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 3.](#)

No

Repair the short circuit to ground in harness between ECM connector and front oxygen (A/F) sensor connector.

3. CHECK FOR POOR CONTACT.




Check for poor contact of the front oxygen (A/F) sensor connector.

Is there poor contact of front oxygen (A/F) sensor connector?

Yes

Repair the poor contact of front oxygen (A/F) sensor connector.

No

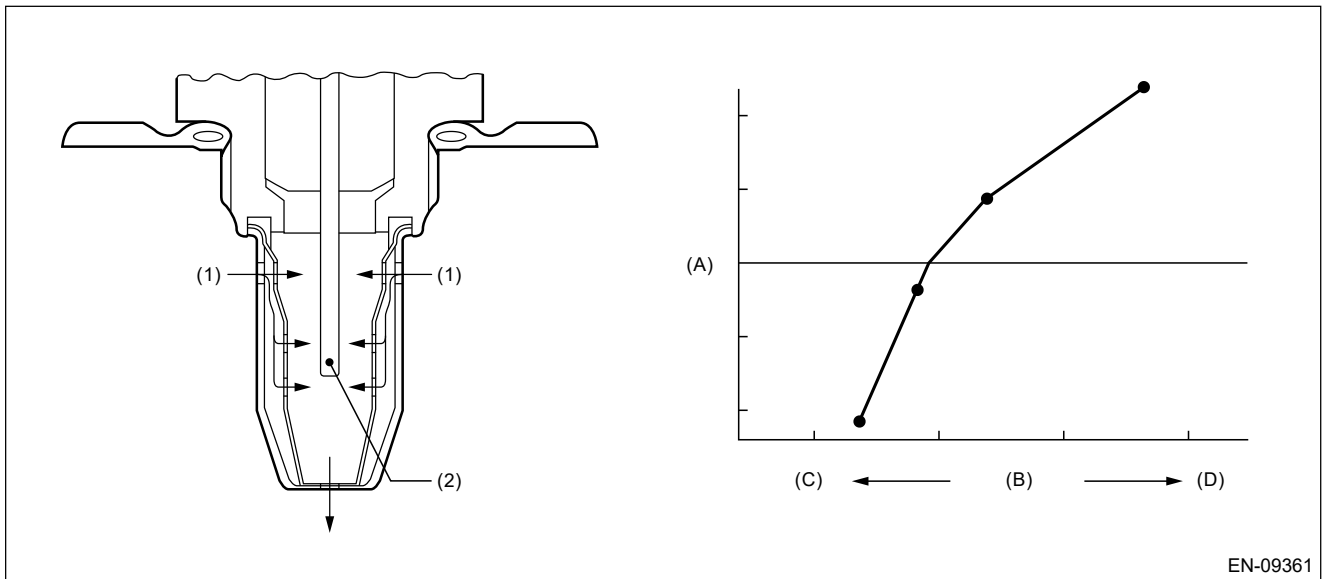
Replace the front oxygen (A/F) sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Front Oxygen \(A/F\) Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of sensor.

Judge as NG, when the element voltage is out of the specified range.

2. COMPONENT DESCRIPTION



(A) Electromotive force

(B) Air fuel ratio

(C) Rich

(D) Lean

(1) Exhaust gas

(2) ZrO₂

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Input voltage (+)	< 0.4V
or	
Input voltage (-)	< 0.4V
or	
Input voltage (+) - Input voltage (-)	< 0.1V
or	
Input voltage (-)	> 3.8V
	or
	< 4.7V

Time needed for diagnosis: 1000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0132 A/F / O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 1

DTC detecting condition:

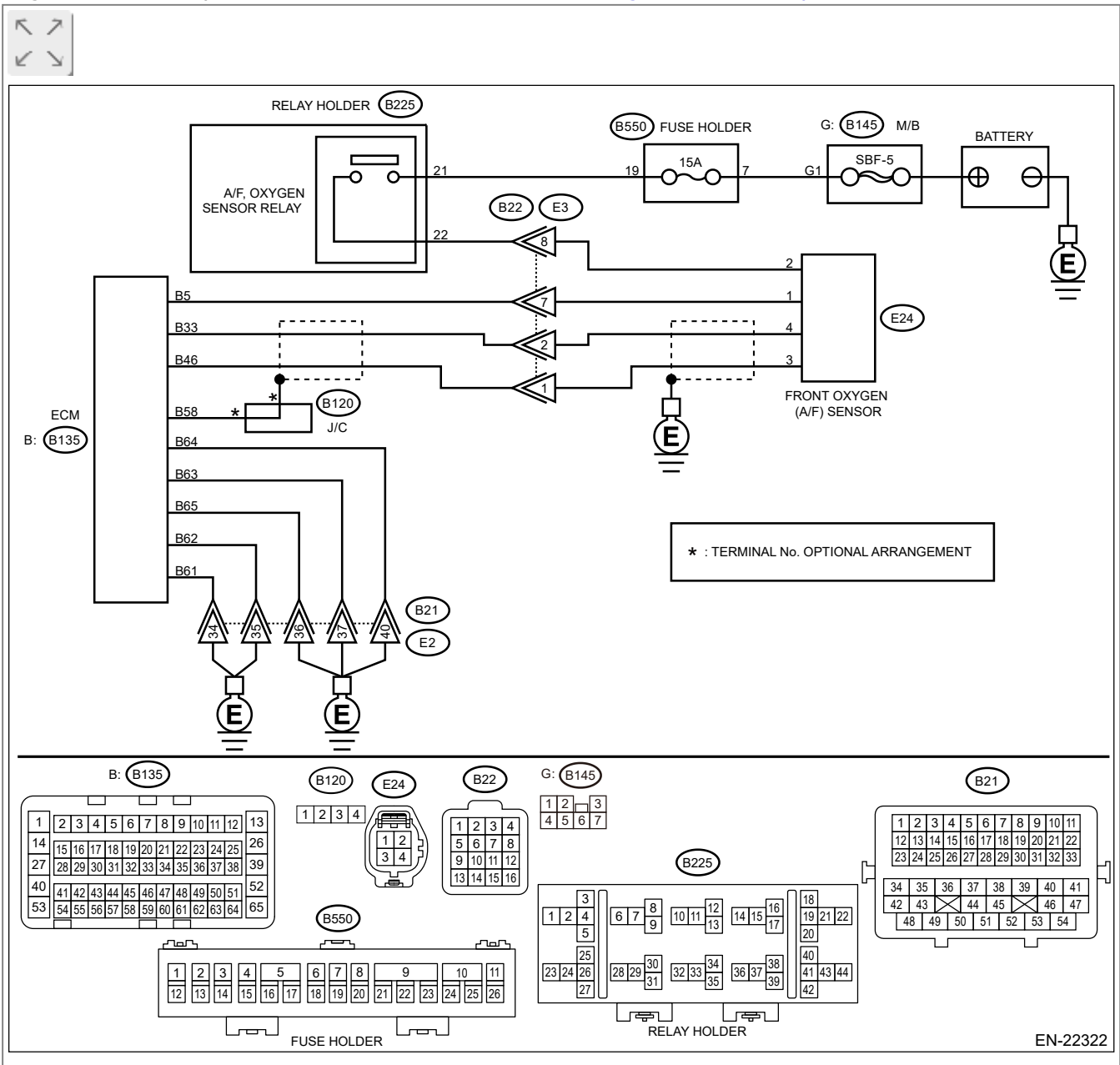
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.



Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B135) No. 33 (+) — Chassis ground (-):


(B135) No. 46 (+) — Chassis ground (-):

Is the voltage 8 V or more?

Yes

Repair the short circuit to power in the harness between ECM connector and front oxygen (A/F) sensor connector.

No

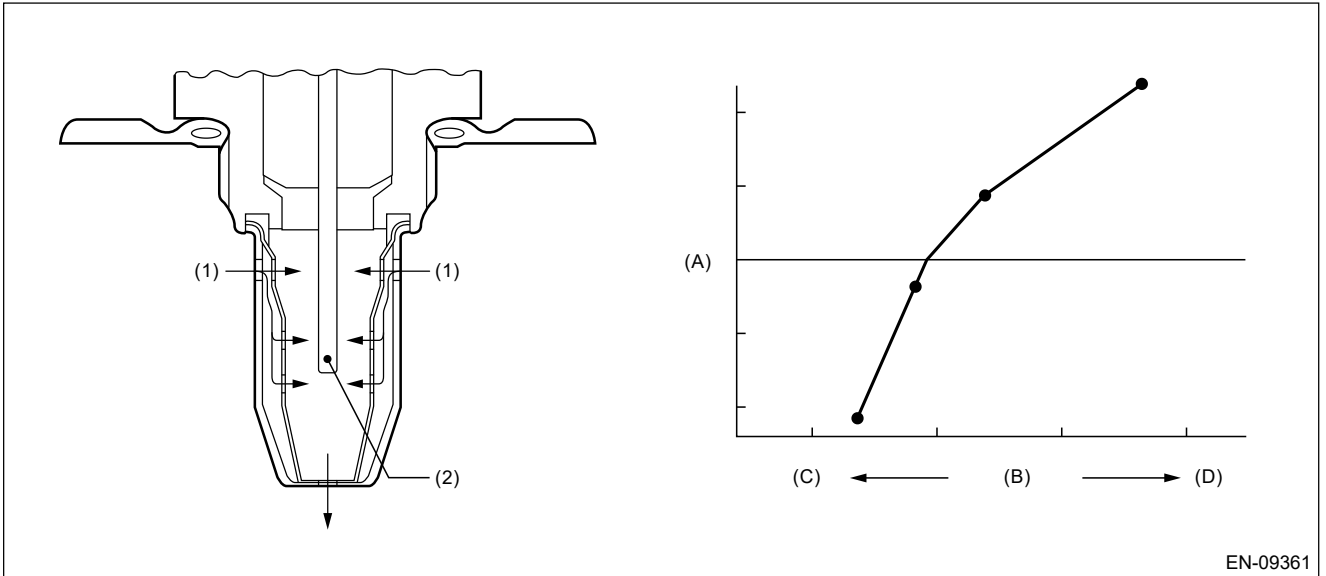
Replace the front oxygen (A/F) sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Front Oxygen \(A/F\) Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of sensor.

Judge as NG, when the element voltage is out of the specified range.

2. COMPONENT DESCRIPTION



- (A) Electromotive force
- (B) Air fuel ratio
- (C) Rich
- (D) Lean
- (1) Exhaust gas
- (2) ZrO₂

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Input voltage (+) or Input voltage (-)	> 4.7V

Time needed for diagnosis:

Input voltage (+): 1000ms

Input voltage (-): 1000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0134 A/F / O2 SENSOR CIRCUIT NO ACTIVITY DETECTED BANK 1 SENSOR 1

DTC detecting condition:

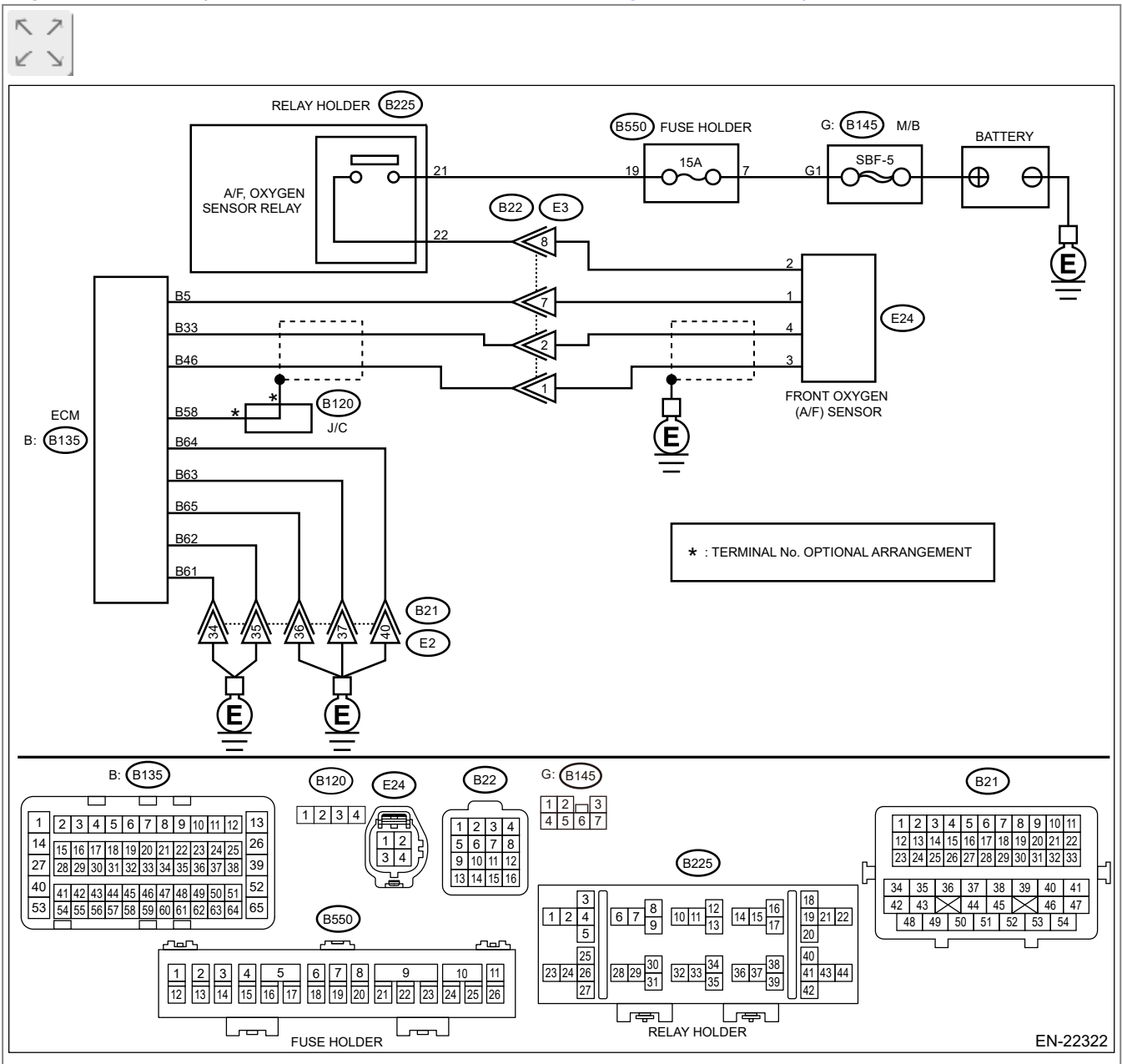
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

Connector & terminal

(B135) No. 46 — (E24) No. 3:

(B135) No. 33 — (E24) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 2.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and front oxygen (A/F) sensor connector**
- **Poor contact of coupling connector**

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM and front oxygen (A/F) sensor connector.

Is there poor contact of ECM or front oxygen (A/F) sensor connector?

Yes

Repair the poor contact of ECM or front oxygen (A/F) sensor connector.

No

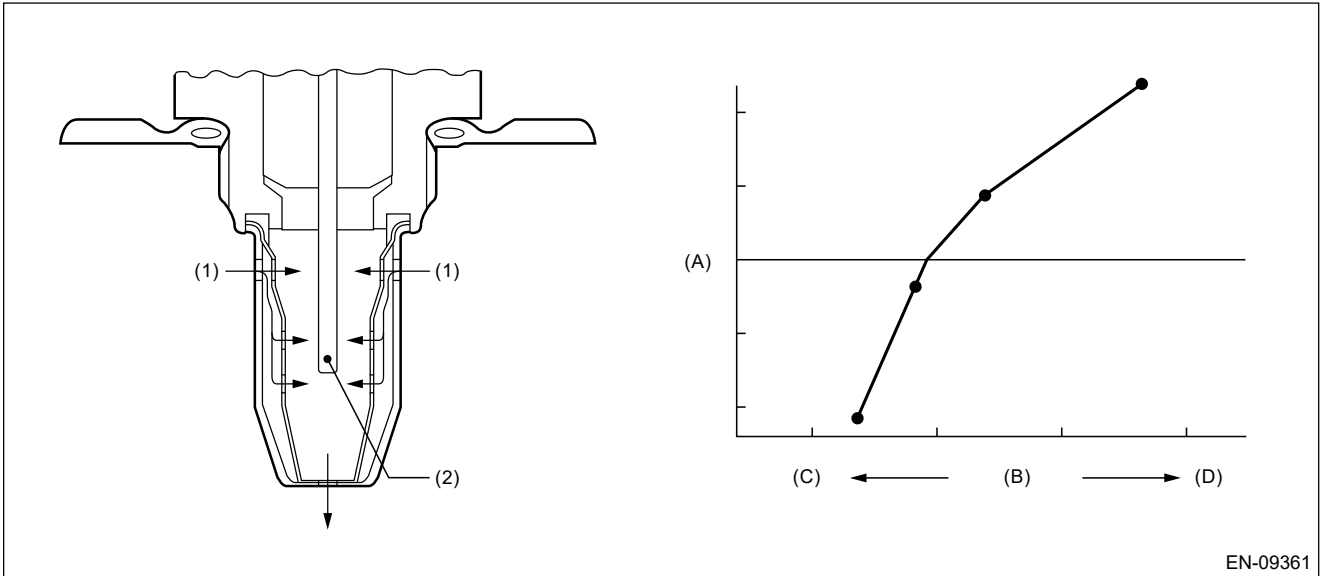
Replace the front oxygen (A/F) sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Front Oxygen \(A/F\) Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect open circuits of the sensor.

Judge as NG when the impedance of the element is large.

2. COMPONENT DESCRIPTION



- (A) Electromotive force
- (B) Air fuel ratio
- (C) Rich
- (D) Lean
- (1) Exhaust gas
- (2) ZrO₂

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Time of heater control duty at 36000ms or more	≥ 70%

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Front oxygen (A/F) sensor impedance	> 450Ω

Time needed for diagnosis: 5000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0137 O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 2

DTC detecting condition:

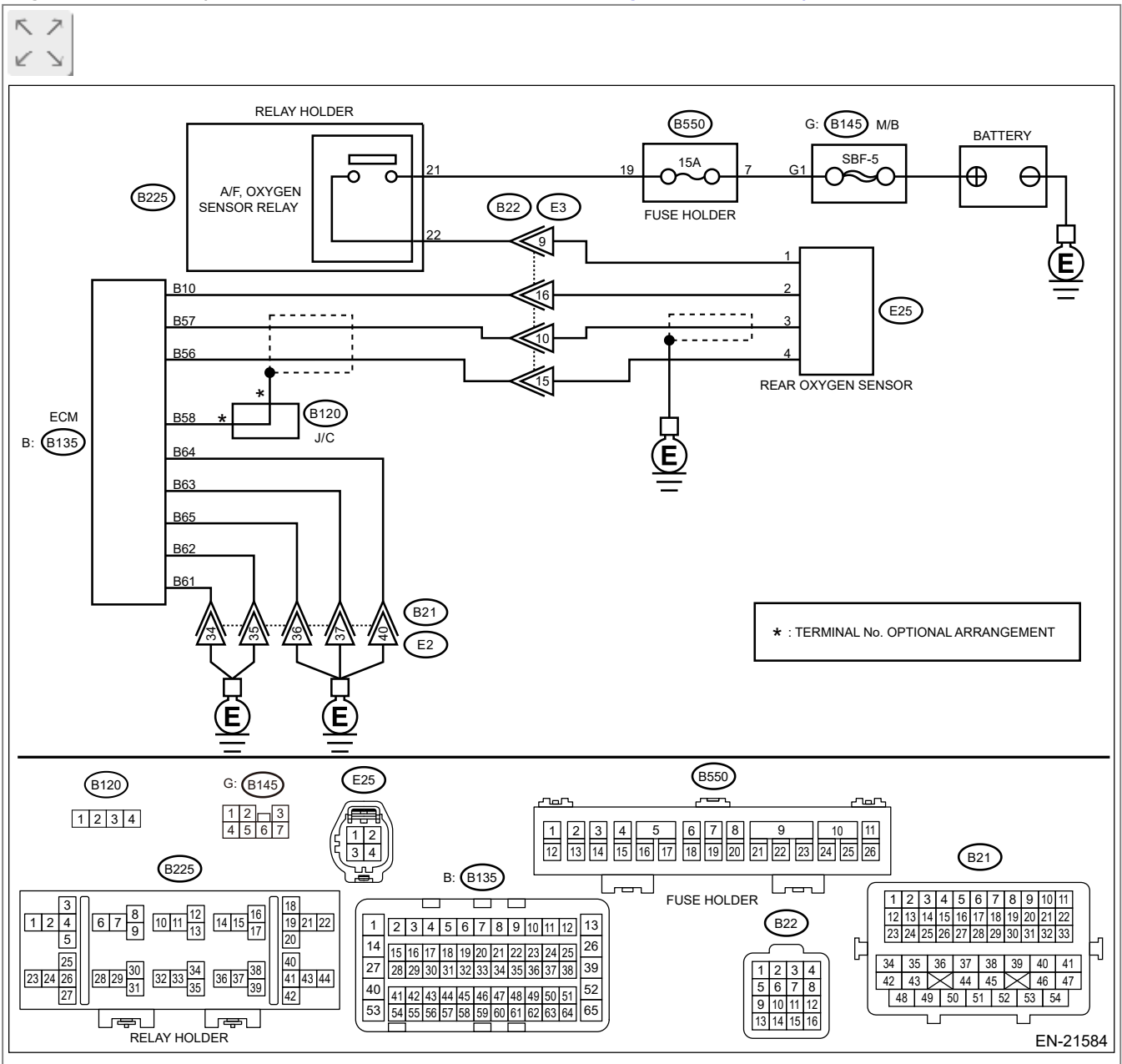
Detected when two consecutive driving cycles with fault occur.

Caution:

- After servicing or replacing faulty parts, perform Clear Memory Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:


Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK REAR OXYGEN SENSOR DATA.

1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and keep the engine speed at 3,000 rpm. (2 minutes maximum)
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Oxygen sensor #12] 0.490 V or more?

 [Go to 5.](#)

 [Go to 2.](#)

2. CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.

Has water entered the connector?

Completely remove any water inside.

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from rear oxygen sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.

Connector & terminal

(B136) No. 21 — (E25) No. 3:

(B135) No. 30 — (E25) No. 4:

Is the resistance less than 1 Ω?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and rear oxygen sensor connector**
- **Poor contact of coupling connector**

4. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.


1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between rear oxygen sensor connector and chassis ground.

Connector & terminal

(E25) No. 3 (+) — Chassis ground (-):

Is the voltage 0.2 — 0.5 V?

Yes

Replace the rear oxygen sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Rear Oxygen Sensor.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and rear oxygen sensor connector**
- **Poor contact of coupling connector**
- **Poor contact of ECM connector**

5. CHECK EXHAUST SYSTEM.


Check exhaust system parts.

Note:

Check the following items.


- **Looseness and improper fitting of exhaust system parts**
- **Damage (crack, hole etc.) of parts**
- **Loose part and improper installation between front oxygen (A/F) sensor and rear oxygen sensor**

Is there any fault in exhaust system?

 Repair or replace faulty parts.

Yes

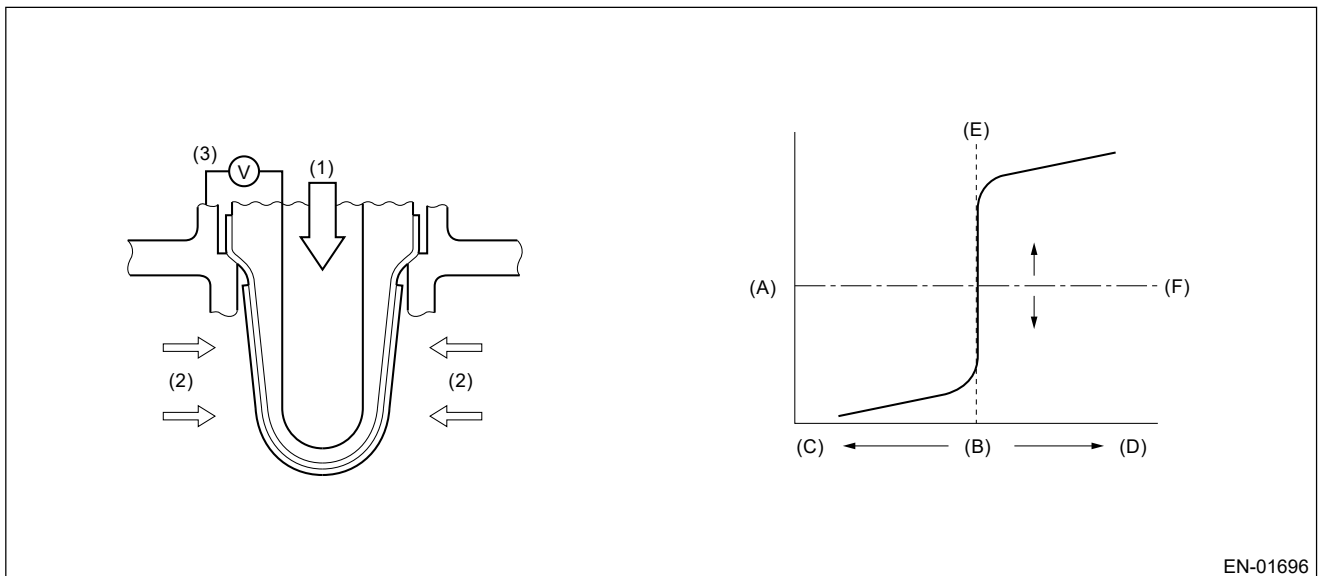
No

Replace the rear oxygen sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Rear Oxygen Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect continuity NG of the oxygen sensor. If the oxygen sensor voltage reading is not within the probable range considering the operating conditions, judge as NG.

2. COMPONENT DESCRIPTION



EN-01696

(A) Electromotive force

(B) Air fuel ratio

(C) Lean

(D) Rich

(E) Theoretical air fuel ratio

(F) Comparative voltage

(1) Atmosphere

(2) Exhaust gas

(3) Electromotive force

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Judgment 1 (P0137, P0138)	
Battery voltage	$\geq 10.9 \text{ V}$
Judgment 2, 3 (P0137)	
Battery voltage	$\geq 10.9 \text{ V}$
Estimated temperature of the rear oxygen sensor element	$\geq 500^\circ\text{C}$ (932°F)
Rear oxygen sensor duty ratio after engine start	$\geq 10500\%$
Rear oxygen sensor offset signal	$\geq 1.28\text{V}$ and $\leq 1.68\text{V}$

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Judgment 1: Ground short		P0137
Rear oxygen sensor offset signal	< 1.28V	
Judgment 2: Open circuit		
Rear oxygen sensor signal	< 1.18V	P0138
Judgment 3: Out of range		
Output voltage of rear oxygen sensor	< -0.22V	
Judgment 1: Power supply short		P0138
Rear oxygen sensor offset signal	> 1.68V	
Judgment 2: Power supply short		
Rear oxygen sensor signal	< 2.73V	
Judgment 3: Out of range		
Output voltage of rear oxygen sensor	< 1.2V	

Time needed for diagnosis:

P0137: 1000ms

P0138: 1000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0138 O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 2

DTC detecting condition:

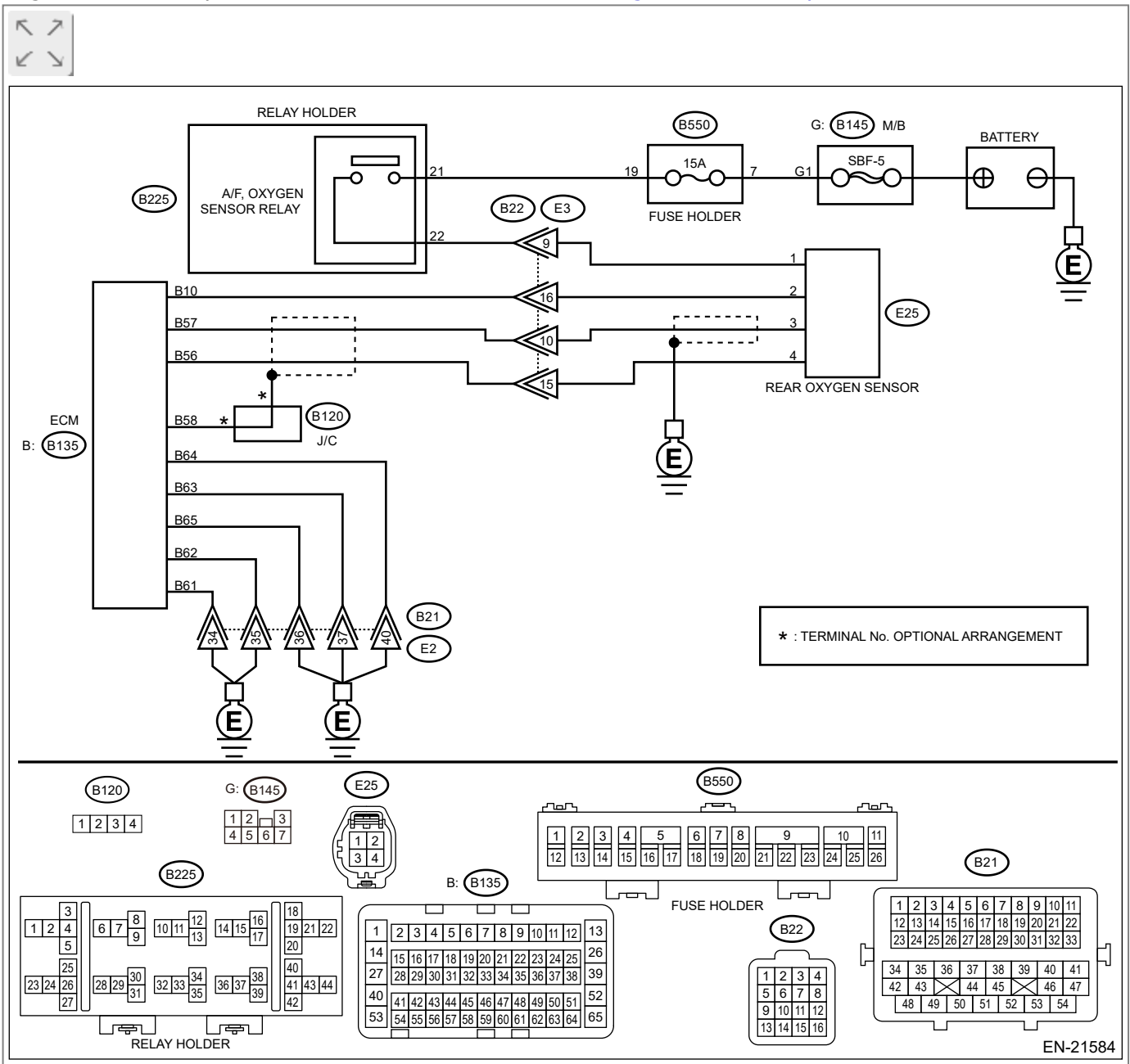
Detected when two consecutive driving cycles with fault occur.

Caution:

- After servicing or replacing faulty parts, perform **Clear Memory**  **Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode**  **Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..**
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:


Engine Electrical System  **Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.**



1. CHECK REAR OXYGEN SENSOR DATA.

1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and rapidly reduce the engine speed from 3,000 rpm.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Oxygen sensor #12] 0.250 V or less?

Yes

 [Go to 5.](#)

No

 [Go to 2.](#)

2. CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.

Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from rear oxygen sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.

Connector & terminal

(B136) No. 21 — (E25) No. 3:

(B135) No. 30 — (E25) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and rear oxygen sensor connector**
- **Poor contact of coupling connector**

4. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.


1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between rear oxygen sensor connector and chassis ground.

Connector & terminal

(E25) No. 3 (+) — Chassis ground (-):

Is the voltage 0.2 — 0.5 V?

Yes

Replace the rear oxygen sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Rear Oxygen Sensor.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and rear oxygen sensor connector**
- **Poor contact of coupling connector**
- **Poor contact of ECM connector**

5. CHECK EXHAUST SYSTEM.

Check exhaust system parts.

Note:

Check the following items.


- **Looseness and improper fitting of exhaust system parts**
- **Damage (crack, hole etc.) of parts**
- **Loose part and improper installation between front oxygen (A/F) sensor and rear oxygen sensor**

Is there any fault in exhaust system?

Yes


Repair or replace faulty parts.

No

Replace the rear oxygen sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Rear Oxygen Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0137.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0137 O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 2.](#)



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P013A O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2

DTC detecting condition:

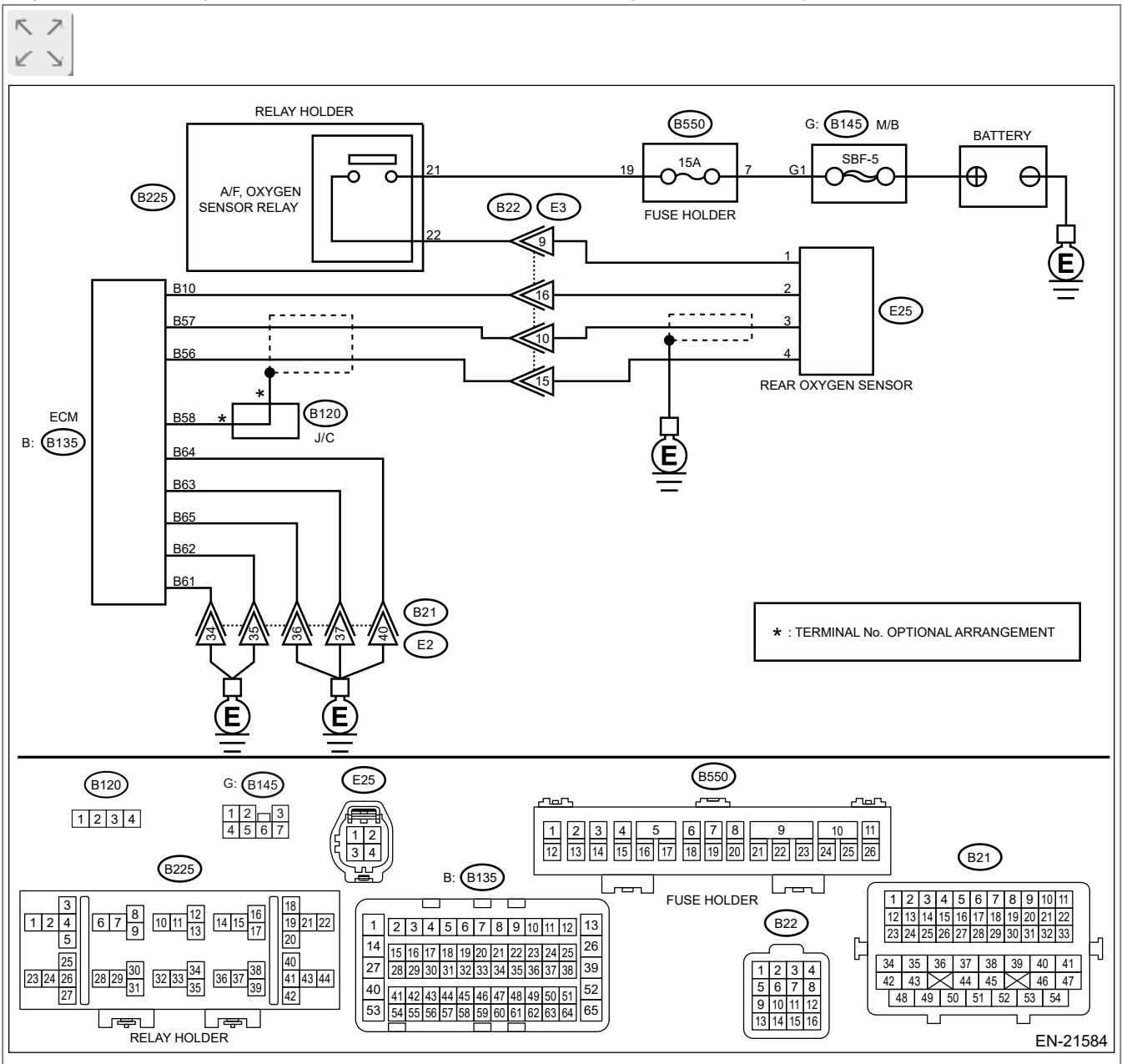
Detected when two consecutive driving cycles with fault occur.

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from rear oxygen sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.

Connector & terminal

(B135) No. 57 — (E25) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 2.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and rear oxygen sensor connector**
- **Poor contact of coupling connector**

2. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.




Measure the resistance between rear oxygen sensor connector and chassis ground.

Connector & terminal

(E25) No. 3 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 3.](#)

No

Repair the short circuit to ground in harness between ECM connector and rear oxygen sensor connector.

3. CHECK REAR OXYGEN SENSOR.




Measure the resistance between rear oxygen sensor terminals.

Terminals

No. 3 — No. 4:

Is the resistance less than 1 Ω ?

Yes

Replace the rear oxygen sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Rear Oxygen Sensor.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

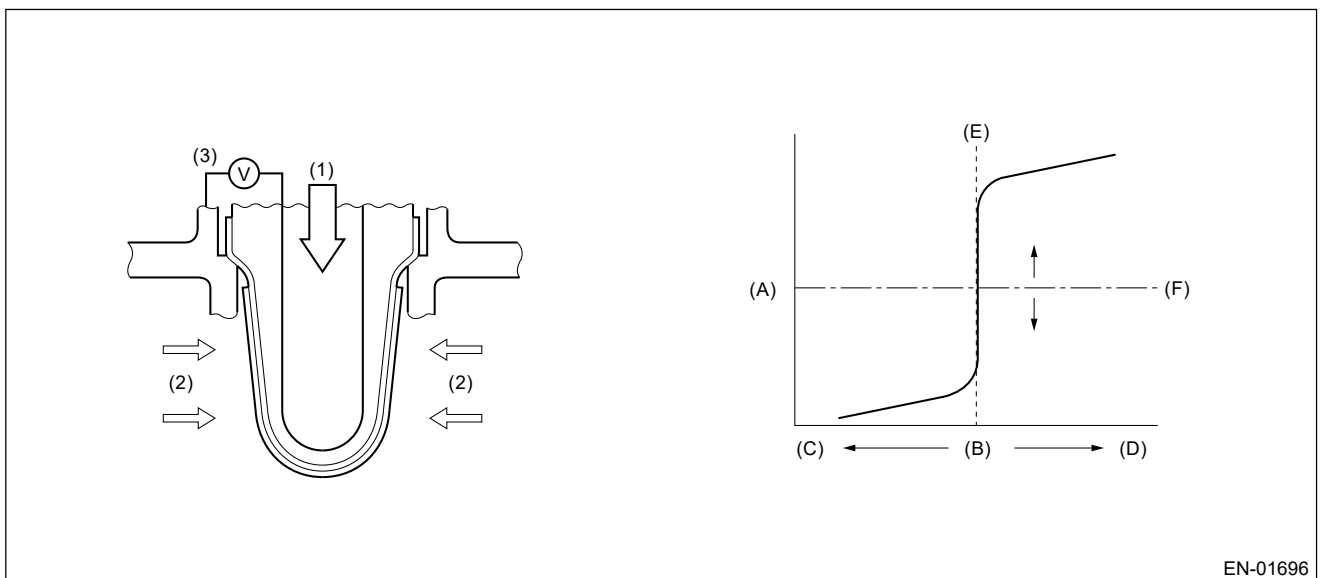
1. OUTLINE OF DIAGNOSIS

Detect the slow response of rich → lean for rear oxygen sensor output.

When the deceleration fuel cut has occurred, detect the trouble by calculating the time when the rear oxygen sensor output passes through the predetermined range of voltages.

Judge as NG when the response time is larger than the threshold value.

2. COMPONENT DESCRIPTION



EN-01696

(A) Electromotive force

(B) Air fuel ratio

(C) Lean

(D) Rich

(E) Theoretical air fuel ratio

(F) Comparative voltage

(1) Atmosphere

(2) Exhaust gas

(3) Electromotive force

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Current calculation time of the rear oxygen sensor heater after starting	≥ 180000 ms
Rear oxygen sensor voltage	≥ 0.55 V

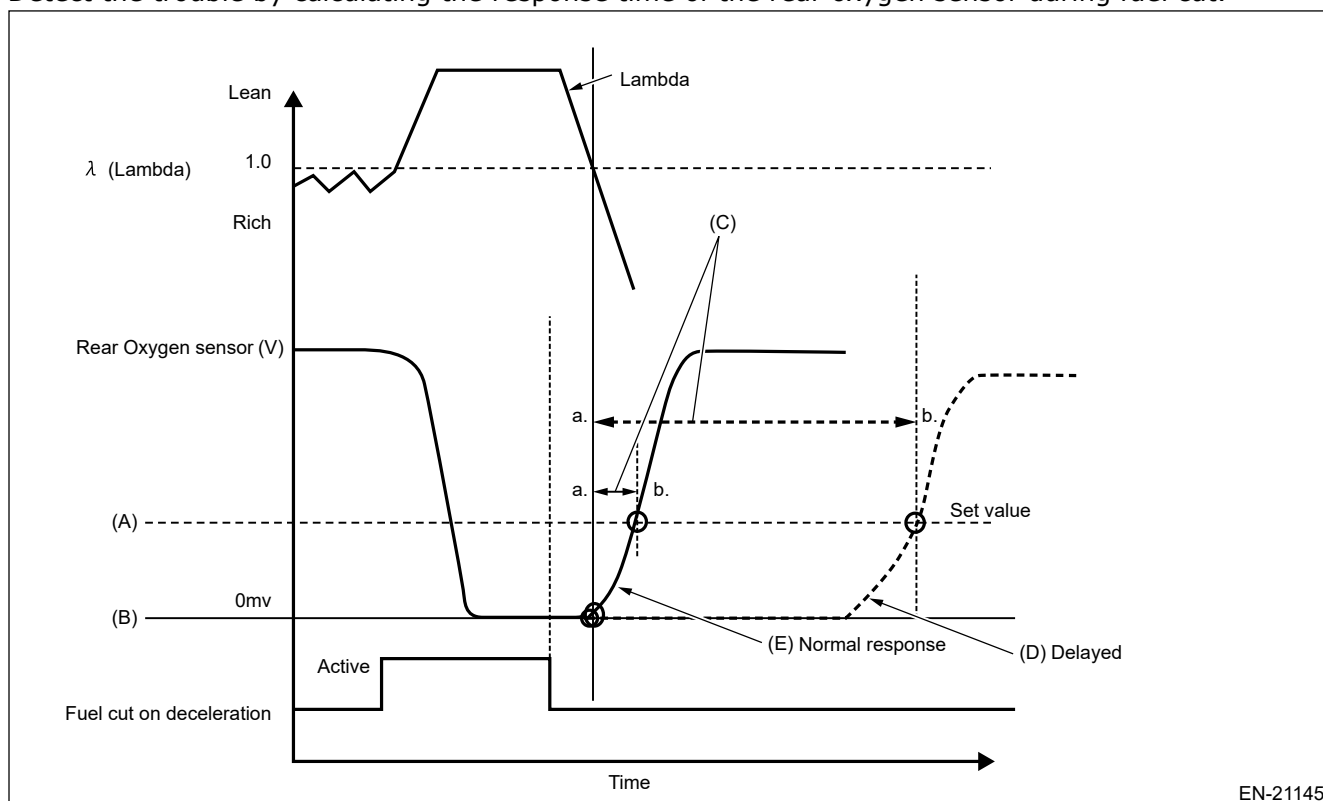
when fuel cut starts	
Fuel cut	In operation
Estimated temperature of rear oxygen sensor element when fuel cut starts	$\geq 500^{\circ}\text{C}$ (932°F)

4. GENERAL DRIVING CYCLE

After starting the engine, perform the diagnosis continuously when engine is low speed.

5. DIAGNOSTIC METHOD

Detect the trouble by calculating the response time of the rear oxygen sensor during fuel cut.



(A) 0.3 V

(B) 0 V

(C) Diagnostic parameter

(D) Normal

(E) Malfunction

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Time needed for rear oxygen sensor voltage to change from 0.5 V to 0.2 V	$> 491\text{ms}$


Time needed for diagnosis: 5000ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P013B O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 2

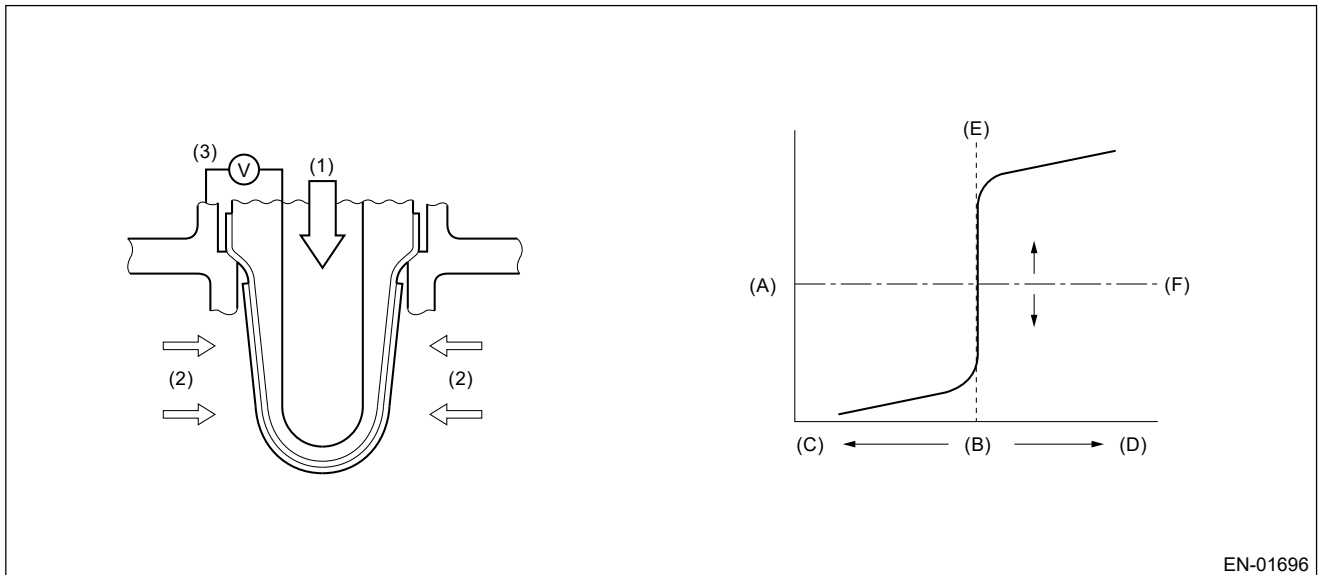
Note:

For the diagnostic procedure, refer to DTC P013A.  Ref. to [ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P013A O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2.](#)

1. OUTLINE OF DIAGNOSIS

Detect the slow response of lean → rich for rear oxygen sensor output.
 After the deceleration fuel cut has occurred, detect the trouble by calculating the time when the rear oxygen sensor output passes through the predetermined range of voltages.
 Judge as NG when the response time is larger than the threshold value.

2. COMPONENT DESCRIPTION



EN-01696

- (A) Electromotive force
- (B) Air fuel ratio
- (C) Lean
- (D) Rich
- (E) Theoretical air fuel ratio
- (F) Comparative voltage
- (1) Atmosphere
- (2) Exhaust gas
- (3) Electromotive force

3. EXECUTION CONDITION

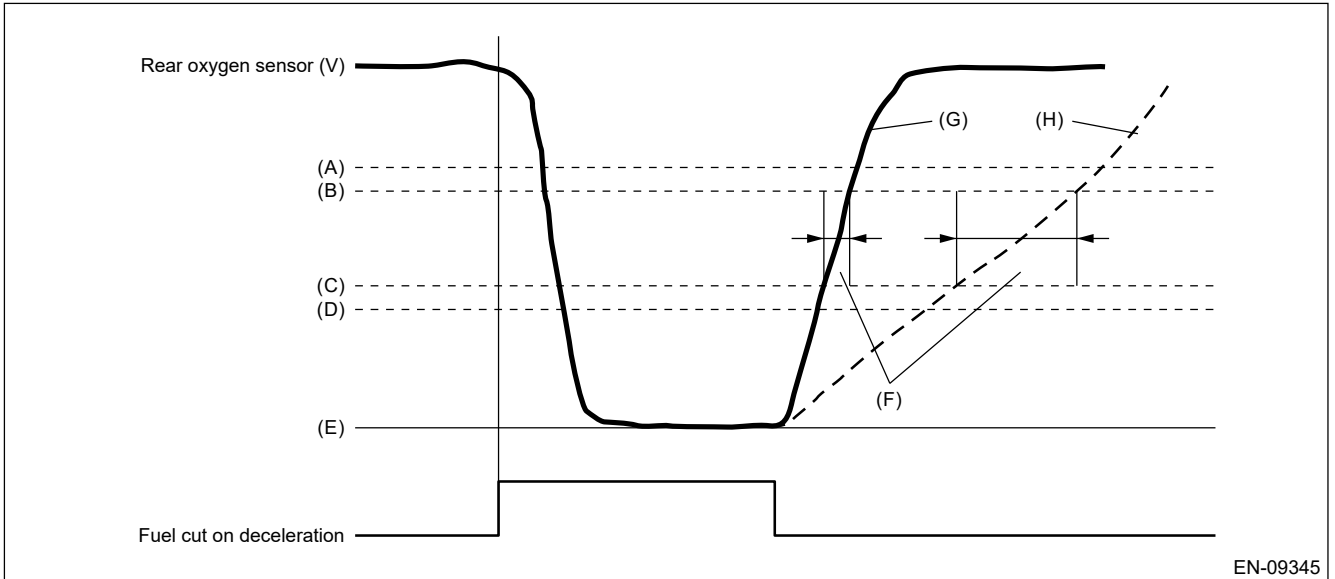
Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Main feedback	In operation
Deceleration fuel cut for 5000 ms or more	Experienced

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Detect the trouble by calculating the response time of the rear oxygen sensor after fuel cut.



- (A) 0.55 V
- (B) 0.50 V
- (C) 0.30 V
- (D) 0.25 V
- (E) 0 V
- (F) Diagnostic parameter
- (G) Normal
- (H) Malfunction

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Time needed for rear oxygen sensor voltage to change from 0.3 V to 0.5 V	> 4000ms


Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P013E O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 2

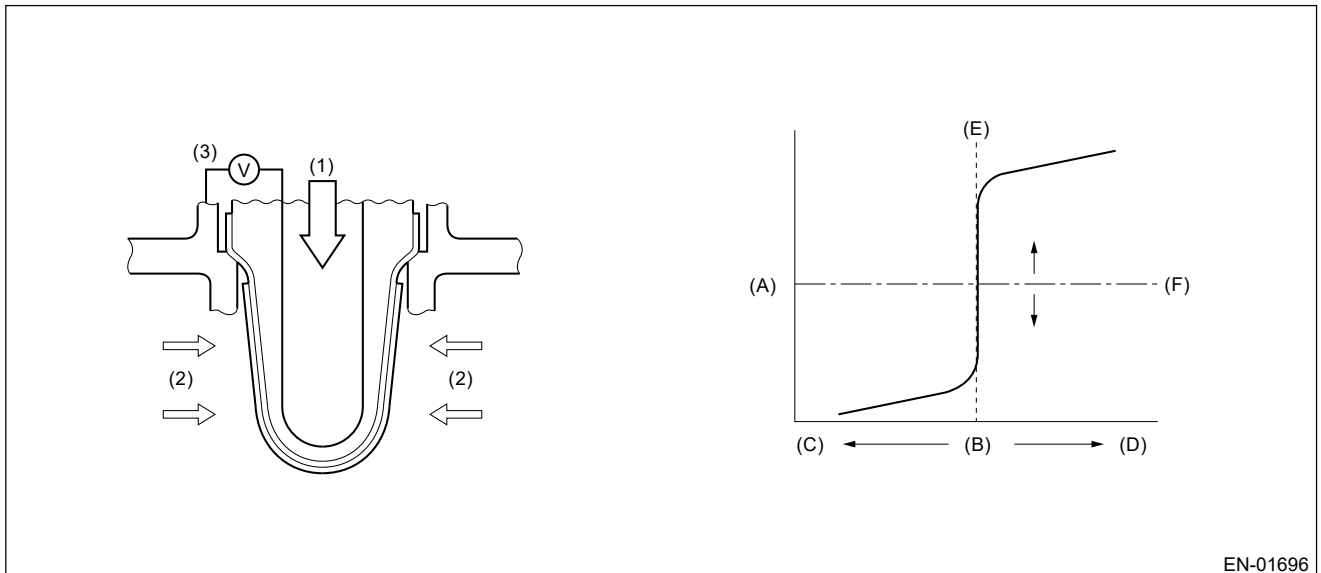
Note:

For the diagnostic procedure, refer to DTC P013A.  Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P013A O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2.

1. OUTLINE OF DIAGNOSIS

Detect the delayed response of rear oxygen sensor output for rich → lean.
 After the deceleration fuel cut has started, detect the trouble by calculating the time when the rear oxygen sensor output decreases to the predetermined voltages.
 Judge as NG when the response time is larger than the threshold value.

2. COMPONENT DESCRIPTION



EN-01696

- (A) Electromotive force
- (B) Air fuel ratio
- (C) Lean
- (D) Rich
- (E) Theoretical air fuel ratio
- (F) Comparative voltage
- (1) Atmosphere
- (2) Exhaust gas
- (3) Electromotive force

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Rear oxygen sensor voltage when fuel cut starts	≥ 0.55V
Fuel cut	In operation
Estimated temperature of rear oxygen sensor element when	≥ 500°C (932°F)

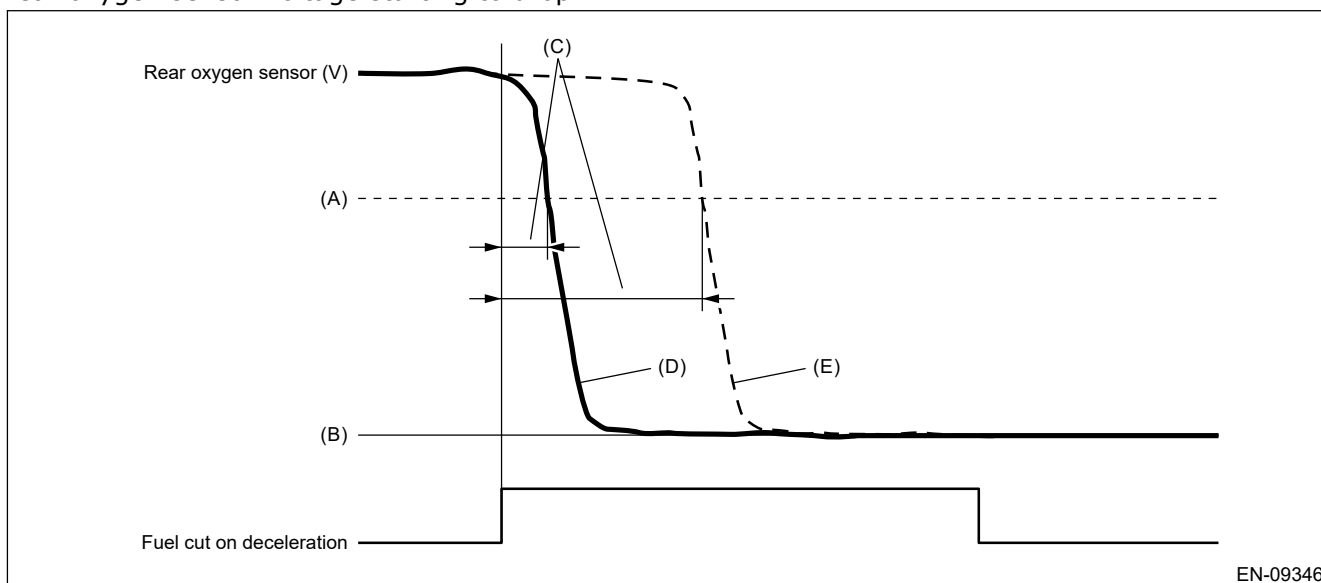
fuel cut starts

4. GENERAL DRIVING CYCLE

Perform diagnosis once during deceleration fuel cut from a constant and high speed driving, when rear oxygen sensor is warmed up sufficiently.

5. DIAGNOSTIC METHOD

Detect the trouble by calculating the time from the beginning of the fuel cut to the beginning of the rear oxygen sensor voltage starting to drop.



(A) 0.5 V

(B) 0 V

(C) Diagnostic parameter

(D) Normal

(E) Malfunction

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Time needed for the rear oxygen sensor voltage to change up to 0.5 V after the fuel cut started	> 4000ms


Time needed for diagnosis: 5000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P013F O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 2

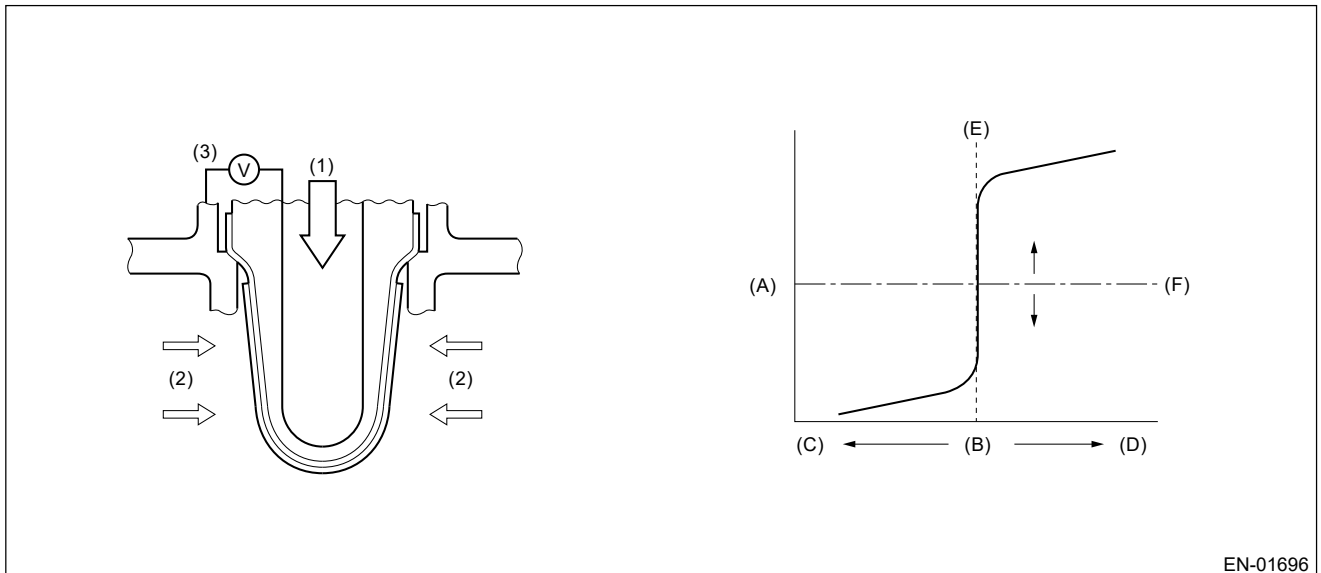
Note:

For the diagnostic procedure, refer to DTC P013A.  Ref. to [ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P013A O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2.](#)

1. OUTLINE OF DIAGNOSIS

Detect the delayed response of rear oxygen sensor output for lean → rich.
 After the deceleration fuel cut has completed, detect the trouble by calculating the time when the rear oxygen sensor output increases to the predetermined voltages.
 Judge as NG when the response time is larger than the threshold value.

2. COMPONENT DESCRIPTION



EN-01696

- (A) Electromotive force
- (B) Air fuel ratio
- (C) Lean
- (D) Rich
- (E) Theoretical air fuel ratio
- (F) Comparative voltage
- (1) Atmosphere
- (2) Exhaust gas
- (3) Electromotive force

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Main feedback	In operation
Rear oxygen sensor voltage when fuel cut has completed	≤ 0.15V
Deceleration fuel cut for 5000 ms or more	Experienced

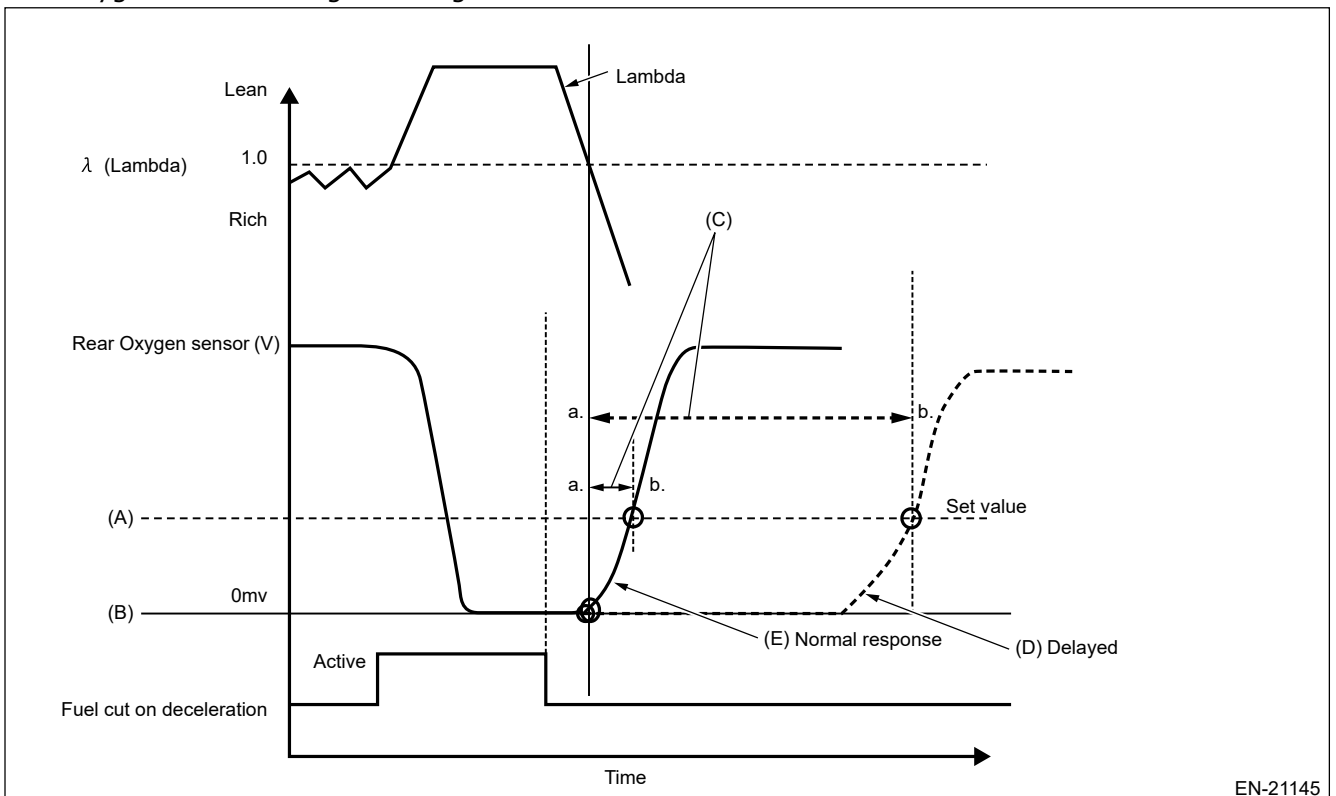
Estimated element temperature of rear oxygen sensor when fuel cut has completed	≥ 500°C (932°F)
Amount of intake air	≥ 10g/s (0.35oz/s)

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Detect the trouble by calculating the time from the completion of the fuel cut to the beginning of the rear oxygen sensor voltage starting to rise.



- (A) 0.3 V
- (B) 0 V
- (C) Diagnostic parameter
- (D) Normal
- (E) Malfunction

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage value of rear oxygen sensor	< 0.2V
Elapsed time*	> Map 1

Map 1

Amount of intake air	10 (0.35)	11 (0.39)	12 (0.42)	16 (0.56)	18 (0.63)	20 (0.71)
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g/s (oz/s)						
Elapsed time ms	7000	5000	4200	3800	3600	3400

*Elapsed time: The time since the λ became less than 1 after the end of fuel cut

Time needed for diagnosis: Less than 1S

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0141 O2 SENSOR HEATER CIRCUIT BANK 1 SENSOR 2

Note:

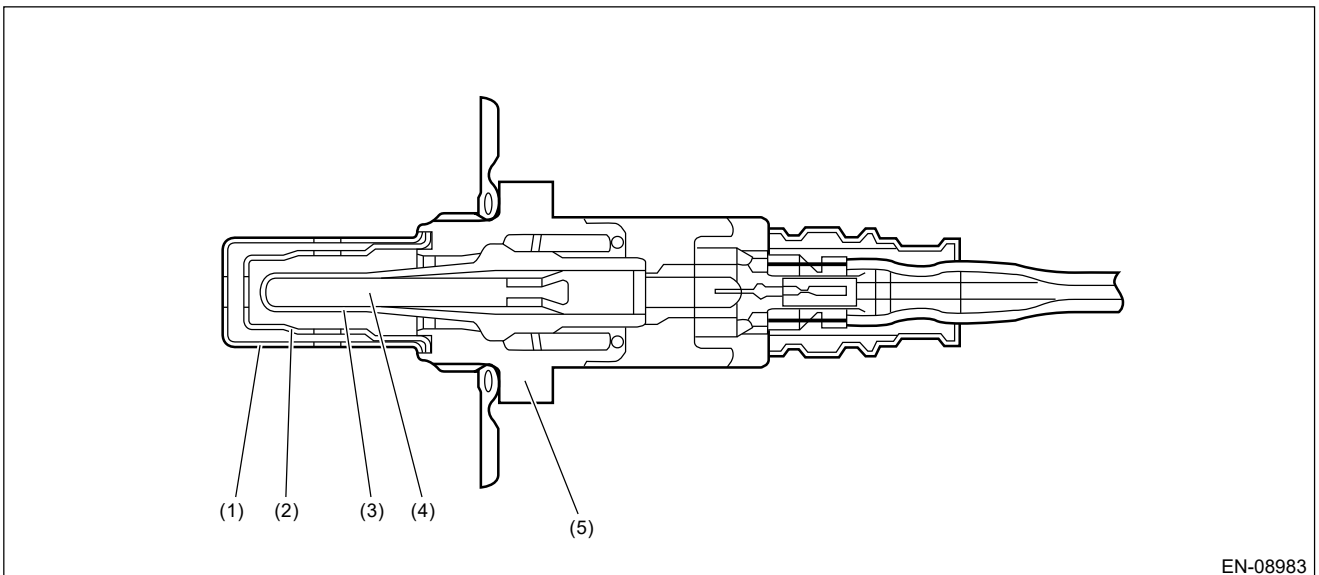
For the diagnostic procedure, refer to DTC P0037.  Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0037 A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 2.

1. OUTLINE OF DIAGNOSIS

Detect malfunction of the rear oxygen sensor heater.

Judge as NG if it is determined that the rear oxygen sensor impedance is large by observing the engine conditions.

2. COMPONENT DESCRIPTION



EN-08983

- (1) Element cover (outer)
- (2) Element cover (inner)
- (3) Sensor element
- (4) Ceramic heater
- (5) Sensor housing

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Elapsed time after starting the engine	$\geq 1000\text{ms}$
A/F sensor heater control duty	$\leq 70\%$
A/F sensor element impedance	$\leq 82\Omega$
Rear oxygen sensor heater control duty	$< 70\%$

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after 1000 ms or more have passed since the engine started.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Rear oxygen sensor heater current	\leq Battery voltage $\times 0.88$ V

Time needed for diagnosis: 1000 ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P014C A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE..

1. CHECK EXHAUST SYSTEM.

Note:

Check the following items.

- Loose installation of front portion of exhaust pipe onto cylinder heads
- Loose connection between front exhaust pipe and front catalytic converter
- Damage of exhaust pipe resulting in a hole

Is there any fault in exhaust system?

Yes

Repair the exhaust system.

No

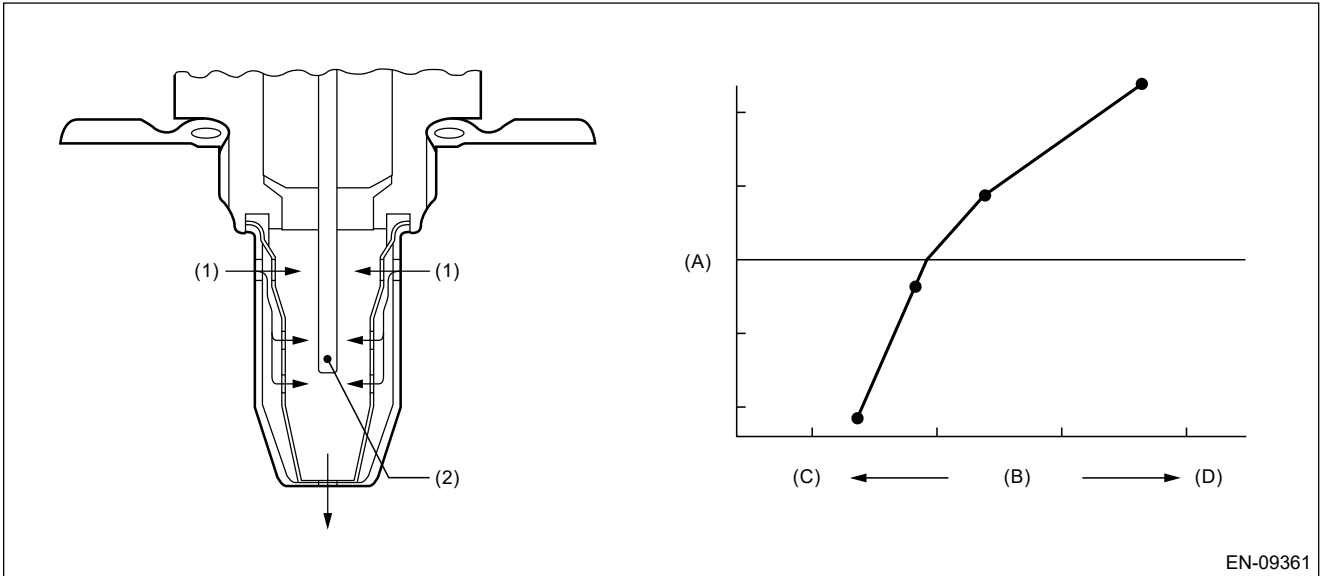
Replace the front oxygen (A/F) sensor.  Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Front Oxygen (A/F) Sensor.

1. OUTLINE OF DIAGNOSIS

Detect the slow response of front oxygen (A/F) sensor.

For diagnosis, detect the trouble by processing the λ waveform in normal driving without forcibly changing the target air fuel ratio.

2. COMPONENT DESCRIPTION



- (A) Electromotive force
- (B) Air fuel ratio
- (C) Rich
- (D) Lean
- (1) Exhaust gas
- (2) ZrO₂

3. EXECUTION CONDITION

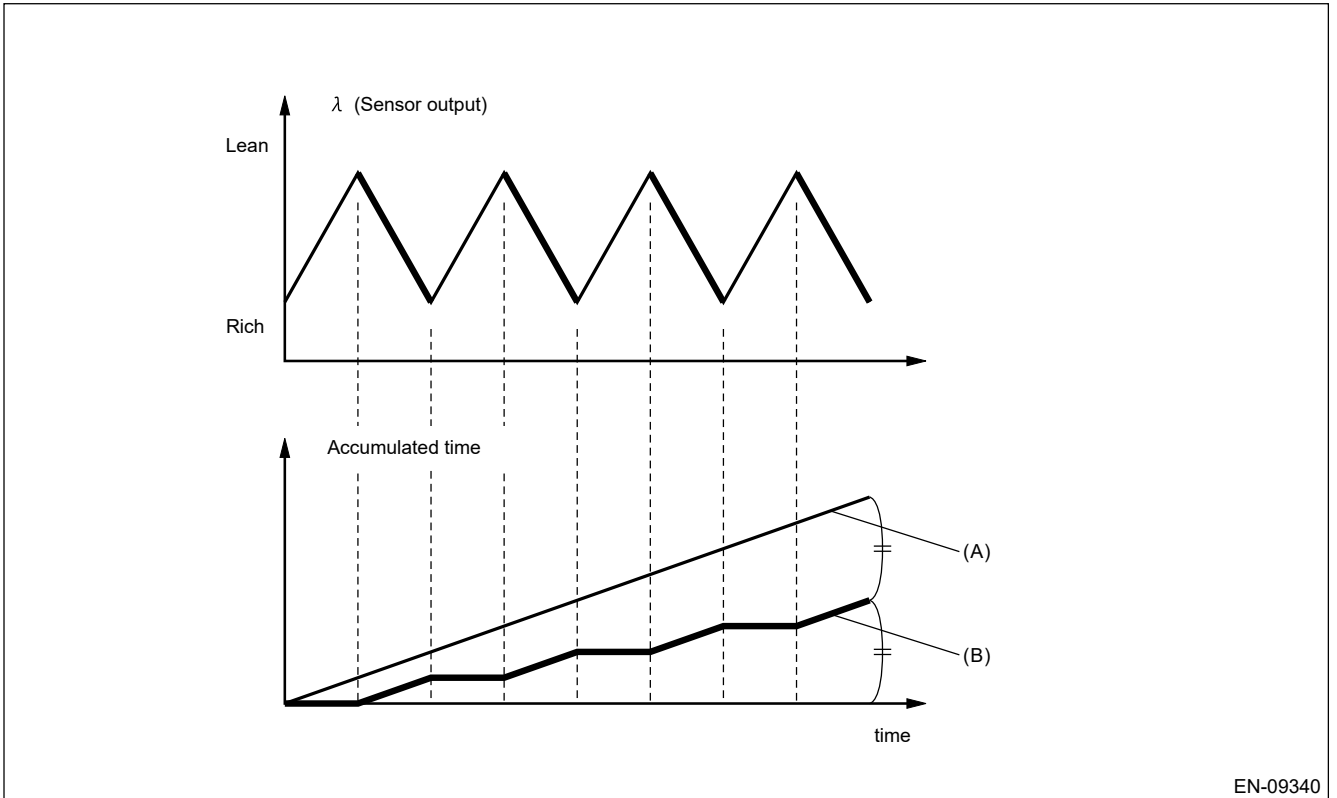
Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Barometric pressure	> 75.1kPa (563mmHg, 22.2inHg)
Closed loop control of 3000 ms or more with main feedback	In operation
Engine speed	≥ 1000rpm
Amount of intake air	≥ 10g/s (0.35oz/s)
Accelerator pedal position	> 0%

4. GENERAL DRIVING CYCLE

Perform diagnosis only once in a city driving including normal acceleration and deceleration.

5. DIAGNOSTIC METHOD 1

Detect the malfunction by checking “Cumulative value of time when λ changes from lean → rich” in comparison to “Time during which diagnosis is in progress”.



EN-09340

- (A) Time during which diagnosis is in progress
- (B) Cumulative value of time when λ changes from lean \rightarrow rich

Judge as NG when the following conditions are established.

Judgment value

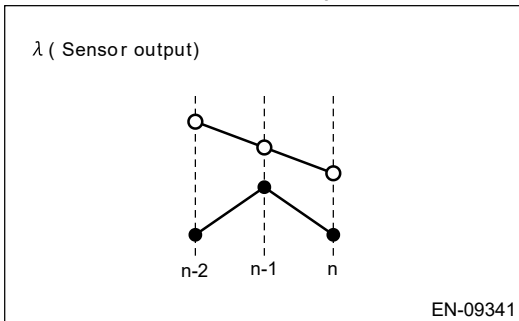
Malfunction Criteria	Threshold Value	DTC
Cumulative value of time when λ changes from lean \rightarrow rich) / (Time during which diagnosis is in progress)	< 0.22	P014C
Average value of time necessary for λ to inverse the air fuel ratio to Lean \rightarrow Rich \rightarrow Lean	> 30ms	
Cumulative value of time when λ changes from lean \rightarrow rich) / (Time during which diagnosis is in progress)	> 0.7	P014D
Average value of time necessary for λ to inverse the air fuel ratio to Rich \rightarrow Lean \rightarrow Rich	> 10ms	

Time needed for diagnosis: 70000ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

6. DIAGNOSTIC METHOD 2

Detect the malfunction by the cumulative value obtained from the amount of variation in λ change.



Judgment value

Malfunction Criteria	Threshold Value	DTC
Cumulative value obtained from the amount of variation in λ change	< Value from Map	P014C and P014D

Map

(AT model)

Cumulative value obtained from the amount of variation in λ	0.00	3.50
Cumulative value obtained from the amount of variation in λ change	0.00	3.50

(MT model)

Cumulative value obtained from the amount of variation in λ	0.00	3.50
Cumulative value obtained from the amount of variation in λ change	0.00	3.50


Time needed for diagnosis: 70000ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P014D A/F / O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 1

Note:

For the diagnostic procedure, refer to DTC P014C.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P014C A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1.](#)

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to DTC P014C.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P014C A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P015A A/F / O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 1

Note:

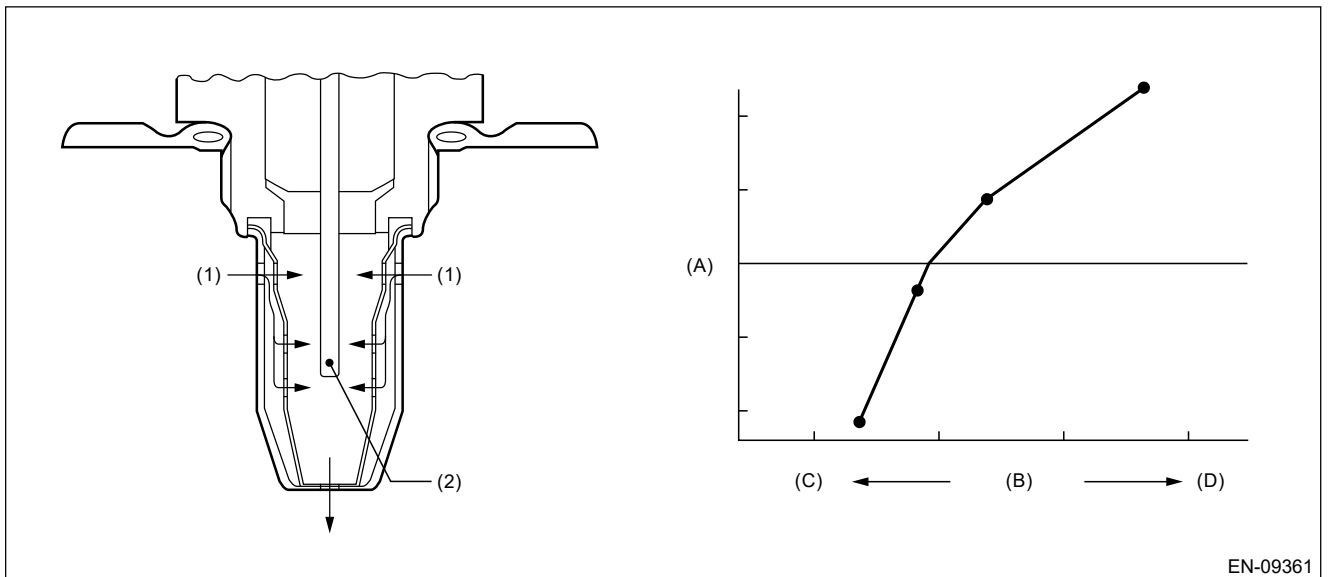
For the diagnostic procedure, refer to DTC P014C.  Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P014C A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1.

1. OUTLINE OF DIAGNOSIS

Detect the slow response of front oxygen (A/F) sensor.

For diagnosis, detect the trouble by processing the λ waveform in normal driving without forcibly changing the target air fuel ratio.

2. COMPONENT DESCRIPTION



- (A) Electromotive force
- (B) Air fuel ratio
- (C) Rich
- (D) Lean
- (1) Exhaust gas
- (2) ZrO₂

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Barometric pressure	> 75.1kPa (563mmHg, 22.2inHg)
Closed loop control of 3000 ms or more with main feedback	In operation
Engine speed	≥ 1000rpm

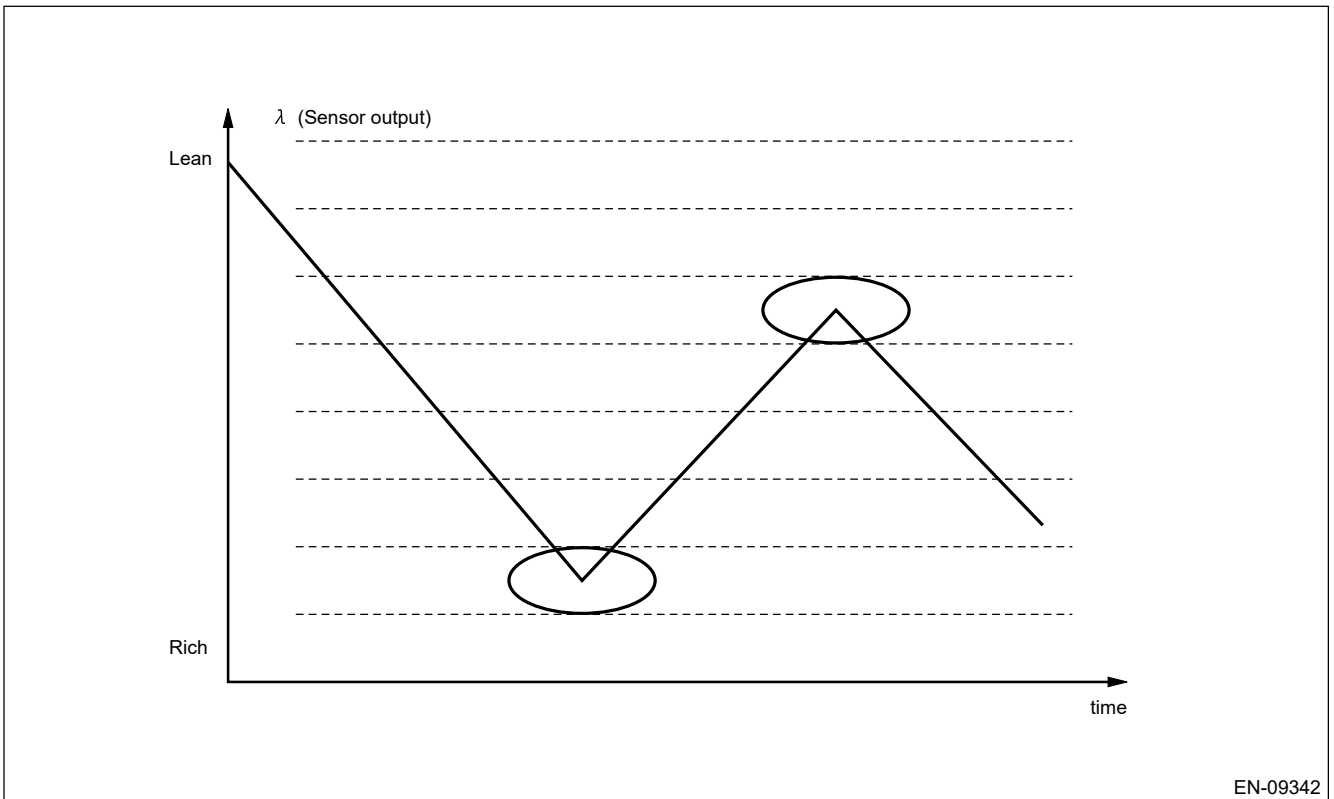
Amount of intake air	$\geq 10\text{g/s}$ (0.35oz/s)
Accelerator pedal position	$> 0\%$

4. GENERAL DRIVING CYCLE

Perform diagnosis only once in a city driving including normal acceleration and deceleration.

5. DIAGNOSTIC METHOD 1

Detect the malfunction depending on the average value of time necessary for λ to inverse the air fuel ratio from "Lean \rightarrow Rich \rightarrow Lean" to "Rich \rightarrow Lean \rightarrow Rich".



Judge as NG when the following conditions are established.

Judgment value

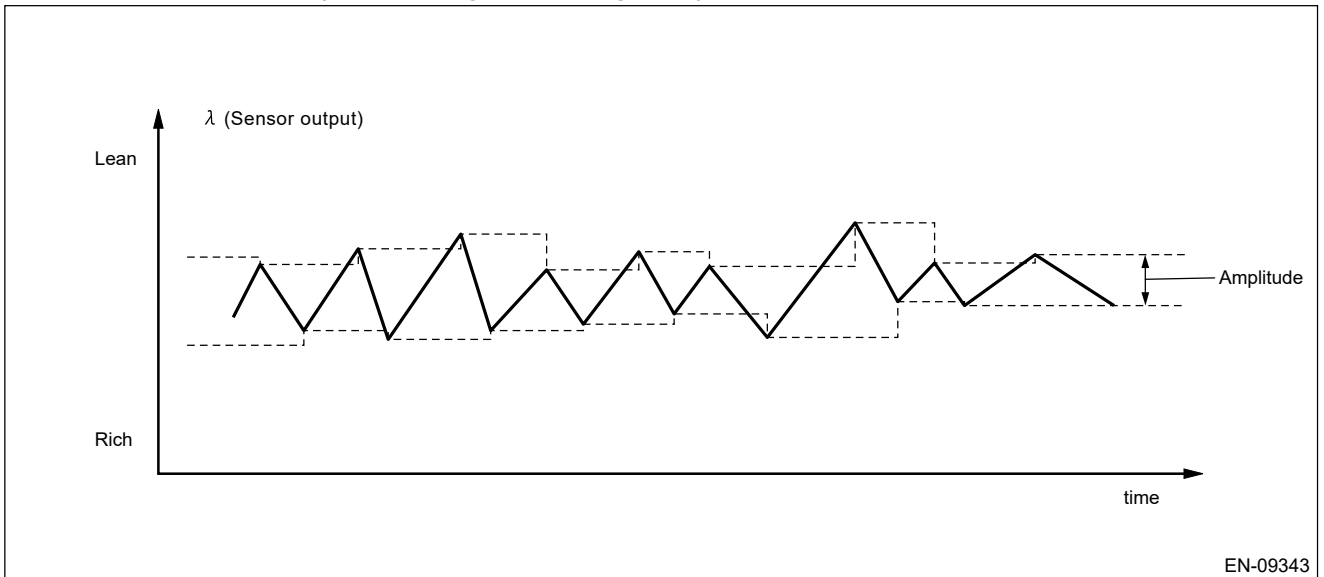
Malfunction Criteria	Threshold Value	DTC
Average value of time necessary for λ to inverse the air fuel ratio to Lean \rightarrow Rich \rightarrow Lean	$> 94\text{ms}$	P015A
Average value when λ is lean	$> 124\text{ms}$	
Average value of time necessary for λ to inverse the air fuel ratio to Rich \rightarrow Lean \rightarrow Rich	$> 200\text{ms}$	P015B
Average value when λ is rich	$> 300\text{ms}$	

Time needed for diagnosis: 70000ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

6. DIAGNOSTIC METHOD 2

Detect the malfunction by calculating the average amplitude of λ .



Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Average value for λ amplitude	> 0.07 (AT model) > 0.07 (MT model)	P015A and P015B


Time needed for diagnosis: 70000ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P015B A/F / O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 1

Note:

For the diagnostic procedure, refer to DTC P014C.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P014C A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P015A.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P015A A/F / O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 1.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0171 SYSTEM TOO LEAN BANK 1

Refer to DTC P0172 for diagnostic procedure.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0172 SYSTEM TOO RICH BANK 1.](#)

1. OUTLINE OF DIAGNOSIS

Detect fuel system malfunction by the amount of main feedback control.
Fuel system is diagnosed by comparing the target air fuel ratio calculated by ECM with the actual air fuel ratio measured by sensor.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Main feedback	In operation

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

Compare the diagnostic value with the threshold value, and if a condition meeting the malfunction criteria continues for 10s × 3time(s) or more, judge that there is a fault in the fuel system.

Judgment value

Malfunction Criteria	Threshold Value
Offset amount of main feedback compensation	≥ Value from Map

Map

Amount of air g/s (oz/s)	0 (0)	3.2 (0.11)	6.4 (0.23)	9.6 (0.34)	12.8 (0.45)	16 (0.56)	19.2 (0.68)
Threshold Value	1.33	1.33	1.33	1.33	1.33	1.33	1.33

Time needed for diagnosis: 10s × 3time(s)

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0172 SYSTEM TOO RICH BANK 1



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Improper idling
- Engine stalls.
- Poor driving performance

Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE..

1. CHECK EXHAUST SYSTEM.

Are there holes or loose bolts on exhaust system?

Repair the exhaust system.

 [Go to 2.](#)

2. CHECK AIR INTAKE SYSTEM.

Are there holes, loose bolts or disconnection of hose on air intake system?

Repair the air intake system.

 [Go to 3.](#)

3. CHECK FUEL PRESSURE.

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.


Measure the fuel pressure.  [Ref. to MECHANICAL\(H4DO\)>Fuel Pressure>INSPECTION.](#)

Caution:



Release fuel pressure before removing the fuel pressure gauge.

Is the measured value 340 — 400 kPa (3.5 — 4.1 kg/cm², 49 — 58 psi)?

Yes

 [Go to 4.](#)


No

Check the fuel pump and fuel delivery line.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Pump>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Delivery and Evaporation Lines>INSPECTION.](#)

4. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Coolant Temp.].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to “Data Monitor”.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Coolant Temp.] 75°C (167°F) or more?

Yes

 [Go to 5.](#)


No

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Coolant Temperature Sensor.](#)

5. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.


1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. For CVT models, set the select lever to “P” range or “N” range, and for MT models, place the shift lever in the neutral position.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Using the Subaru Select Monitor or a general scan tool, read the value of [Mass Air Flow].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Mass Air Flow] 2.0 — 5.0 g/s (0.26 — 0.66 lb/m)?

Yes

 [Go to 6.](#)


No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

6. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. For CVT models, set the select lever to "P" range or "N" range, and for MT models, place the shift lever in the neutral position.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Open the front hood.
6. Measure the ambient temperature.
7. Using the Subaru Select Monitor or a general scan tool, read the value of [Intake Air Temp.].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Subtract ambient temperature from [Intake Air Temp.]. Is the obtained value –10 — 50°C (–18 — 90°F)?

Yes

Repair the poor contact of ECM connector.

No

Check the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

7. CHECK PCV VALVE.


Check the PCV valve.

Is the PCV valve free from deformation, crack or other damage?

Yes

Repair or replace the PCV valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>PCV Valve.](#)

No


 [Go to 8.](#)

8. CHECK PCV HOSE.

Check the PCV hose.

Is the PCV hose free from deformation, crack or other damage?

Yes

Check the PCV hose assembly for cracks, damage or looseness.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>PCV Hose>INSPECTION.](#)

No

Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Detect fuel system malfunction by the amount of main feedback control.

Fuel system is diagnosed by comparing the target air fuel ratio calculated by ECM with the actual air fuel ratio measured by sensor.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Main feedback	In operation

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

Compare the diagnostic value with the threshold value, and if a condition meeting the malfunction criteria continues for 10s × 3time(s) or more, judge that there is a fault in the fuel

system.

Judgment value

Malfunction Criteria	Threshold Value
Offset amount of main feedback compensation	< Value from Map

Map

Warm-up increase compensation coefficient	0.00	0.10	0.20	0.30	0.40	0.47
Threshold Value	0.67- 0.000	0.67- 0.102	0.67- 0.175	0.67- 0.237	0.67- 0.289	0.67- 0.319

Time needed for diagnosis: 10s × 3time(s)

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC) DTC P0196 ENGINE OIL TEMPERATURE SENSOR "A" RANGE/PERFORMANCE


DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Hard to start
- Improper idling
- Poor driving performance


Caution:

After servicing or replacing faulty parts, perform **Clear Memory**  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode>OPERATION.](#) and **Inspection Mode**  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode>PROCEDURE.](#)


1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

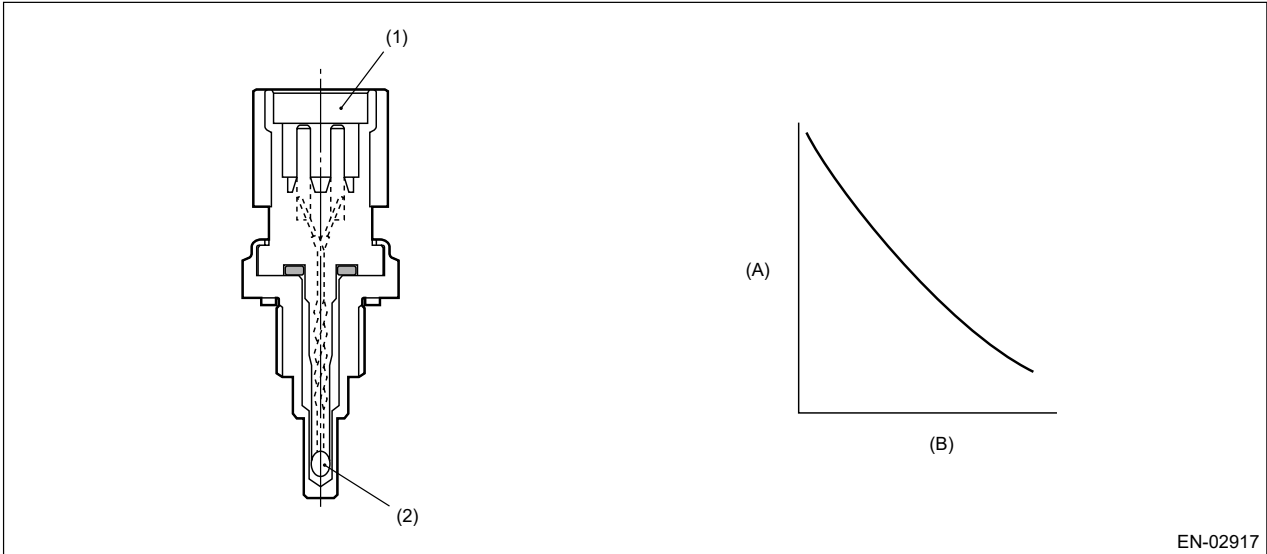
Replace the engine oil temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Oil Temperature Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of the engine oil temperature sensor output properties. Using the following two diagnoses, judge as NG when either is NG.

- **Diagnosis 1 (correlation diagnosis):** After the engine starts after the specified period of soaking time has elapsed, diagnose by correlation between engine oil temperature sensor value, engine coolant temperature sensor value and intake air temperature sensor value. Judge as NG when the differences are both above the specified value by comparing between engine oil temperature and engine coolant temperature, engine oil temperature and intake air temperature.
- **Diagnosis 2 (function diagnosis):** Judge as NG when engine oil temperature does not rise to the specified value regardless of an engine running condition that clears certain conditions.

2. COMPONENT DESCRIPTION



EN-02917

- (A) Resistance value (kΩ)
- (B) Temperature °C (°F)
- (1) Connector
- (2) Thermistor element

3. EXECUTION CONDITION

Diagnosis 1

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Soaking time	≥ 21600s
Block heater judgment	Completed
Block heater operation	Not in operation

Diagnosis 2

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Engine oil temperature at engine starting	< 40 °C (104°F)
Engine speed	≥ 500 rpm
Idling ratio	≤ 50%

4. GENERAL DRIVING CYCLE

- **Diagnosis 1:** Perform the diagnosis only once after the engine starts after a certain period of soaking time.
- **Diagnosis 2:** Perform the diagnosis only once after starting the engine from cold condition.

5. DIAGNOSTIC METHOD

Judge as NG when Diagnosis 1 or Diagnosis 2 becomes NG.
 If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Map 1

--	--	--	--

Ambient temperature °C (°F)	-30 (-22)	30 (86)	45 (113)	60 (140)
Engine oil temperature at engine start – Intake air temperature 30 sec. after engine start °C (°F)	10 (18°F)	10 (18°F)	22 (39.6)	22 (39.6)

Diagnosis 1

Judgment value

Malfunction Criteria	Threshold Value
Engine oil temperature at engine start – Engine coolant temperature at engine start	> 10°C (50°F)
Engine oil temperature at engine start – Intake air temperature 30 sec. after engine start	> Value of Map 1

Time needed for diagnosis: Less than 1 second

Diagnosis 2

Judgment value

Malfunction Criteria	Threshold Value
Engine oil temperature	< 40 °C (104°F)
Elapsed time after starting the engine	≥ Value of Map 2

Map 3

Intake air temperature at engine start °C (°F)	-30 (-22)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)
Elapsed time after starting the engine s	2980	2380	1780	1380	980	780	580	380

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0197 ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT LOW



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

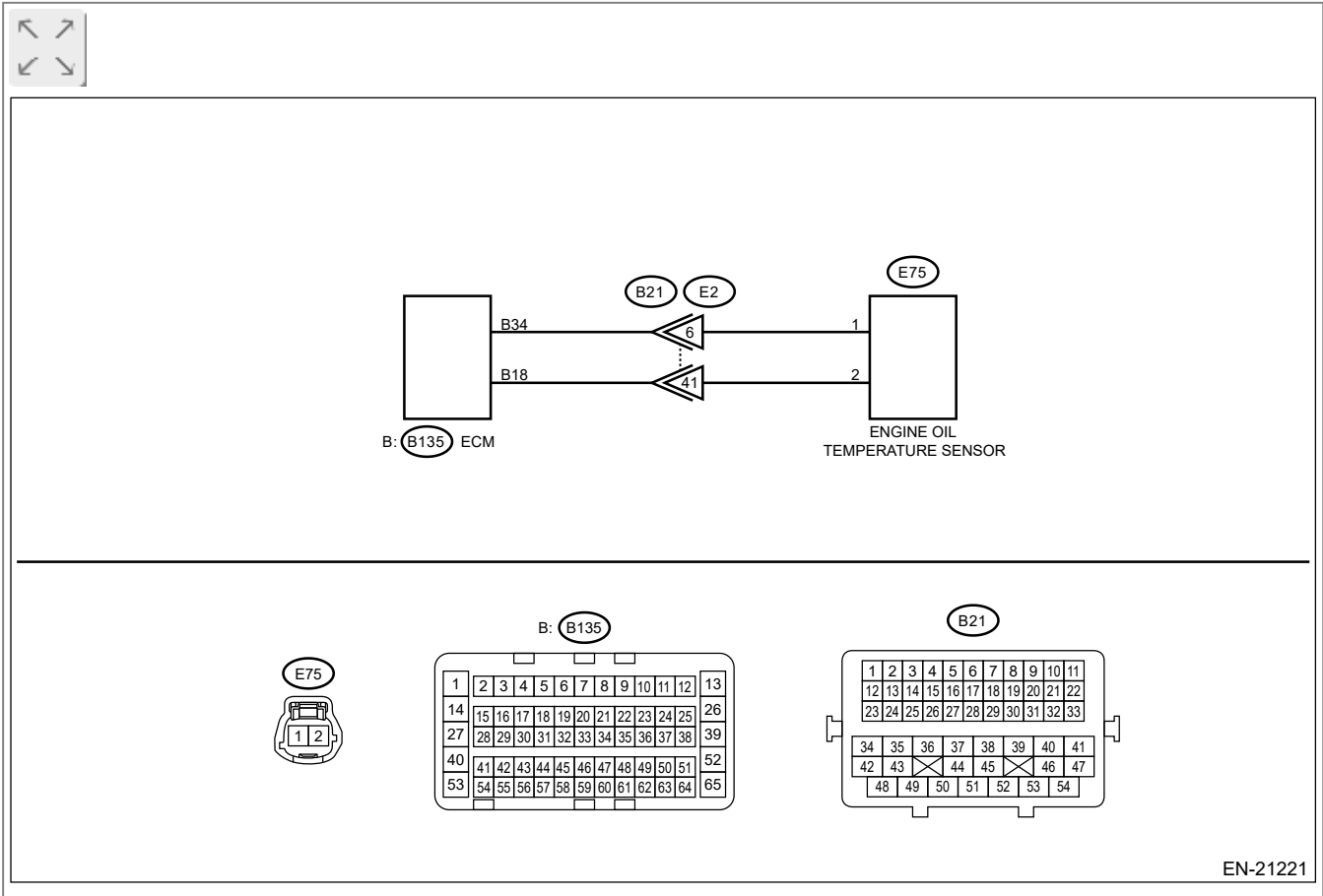
- Hard to start
- Improper idling
- Poor driving performance

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



EN-21221

1. CHECK CURRENT DATA.


1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Engine Oil Temperature].

Note:

For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)

Is the value of [Engine Oil Temperature] 150°C (302°F) or more?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN ECM AND ENGINE OIL TEMPERATURE SENSOR CONNECTOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the engine oil temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B135) No. 18 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

Replace the engine oil temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Oil Temperature Sensor.](#)

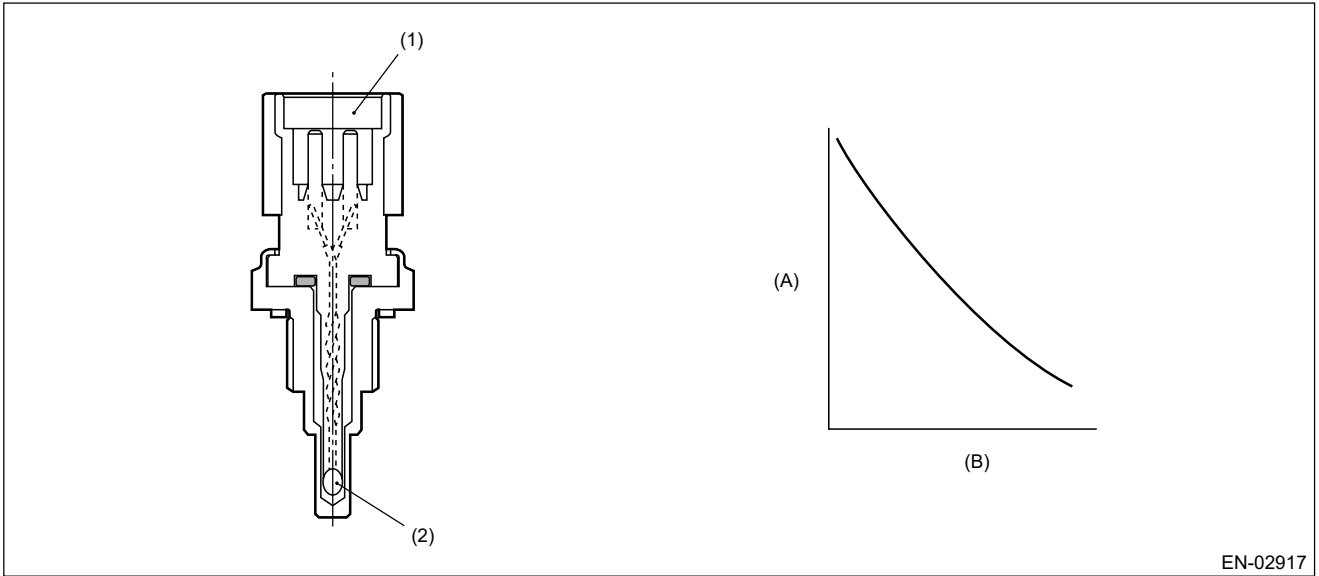
No

Repair the short circuit to ground in the harness between the ECM connector and engine oil temperature sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the oil temperature sensor.
Judge as NG when outside of the judgment value.

2. COMPONENT DESCRIPTION



EN-02917

(A) Resistance value (kΩ)

(B) Temperature °C (°F)

(1) Connector

(2) Thermistor element

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	< 0.203V

Time needed for diagnosis: 500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0198 ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT HIGH



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

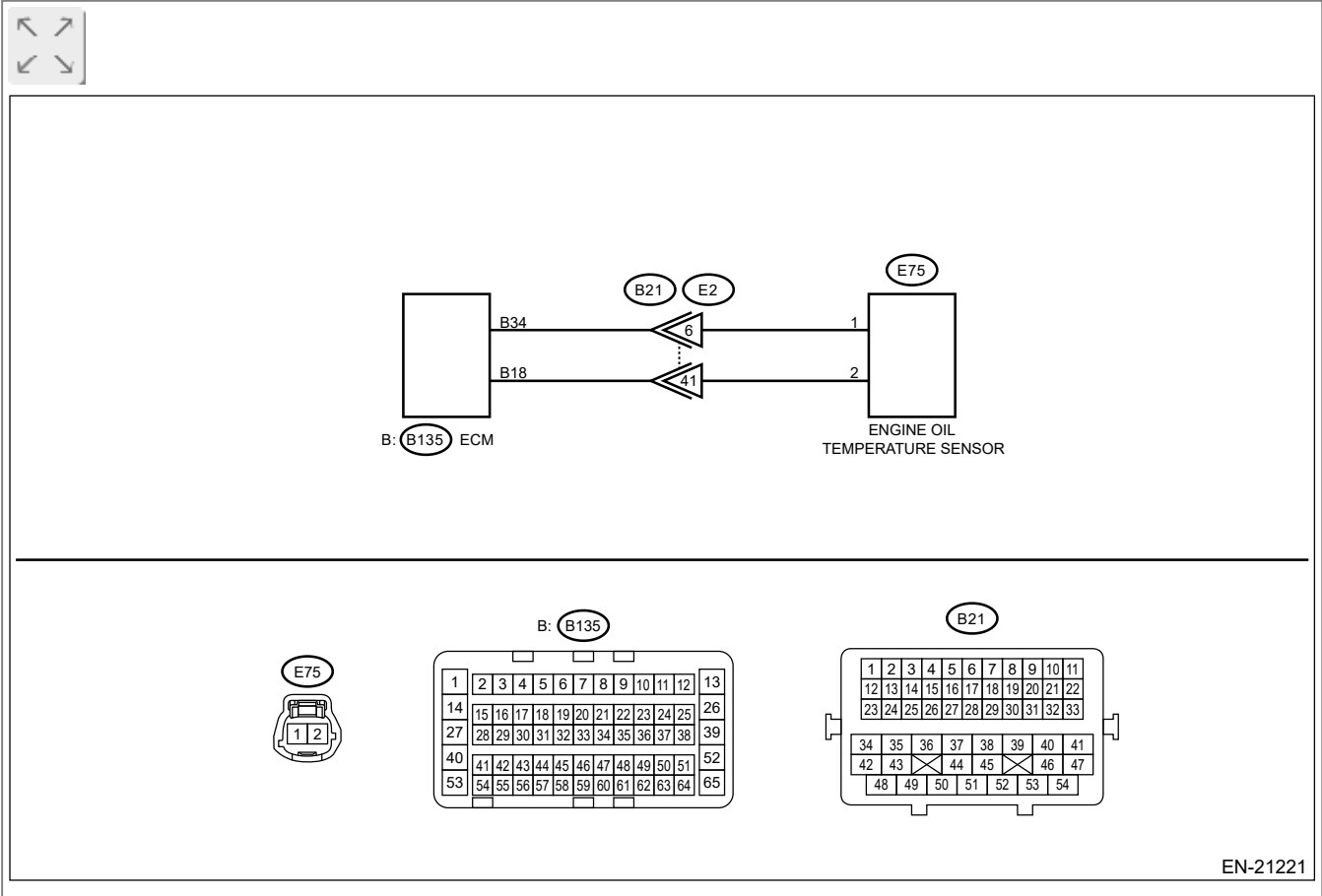
- Hard to start
- Improper idling
- Poor driving performance

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



EN-21221

1. CHECK CURRENT DATA.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Engine Oil Temperature].




Note:

For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)

Is the value of [Engine Oil Temperature] -40°C (-40°F) or less?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK FOR POOR CONTACT.

Check for poor contact between the ECM and engine oil temperature sensor connectors.

Is there poor contact of the ECM or engine oil temperature sensor connectors?

Yes

Repair the poor contact of ECM or engine oil temperature sensor connector.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND ENGINE OIL TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the engine oil temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of the harness between the ECM connector and engine oil temperature sensor connector.

Connector & terminal

(B135) No. 18 — (E75) No. 2:

(B135) No. 34 — (E75) No. 1:

Is the resistance less than $1\ \Omega$?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- Open circuit in harness between ECM connector and engine oil temperature sensor connector
- Poor contact of coupling connector

4. CHECK HARNESS BETWEEN ECM AND ENGINE OIL TEMPERATURE SENSOR CONNECTOR.



1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal


(B135) No. 18 (+) — Chassis ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in harness between ECM connector and engine oil temperature sensor connector.

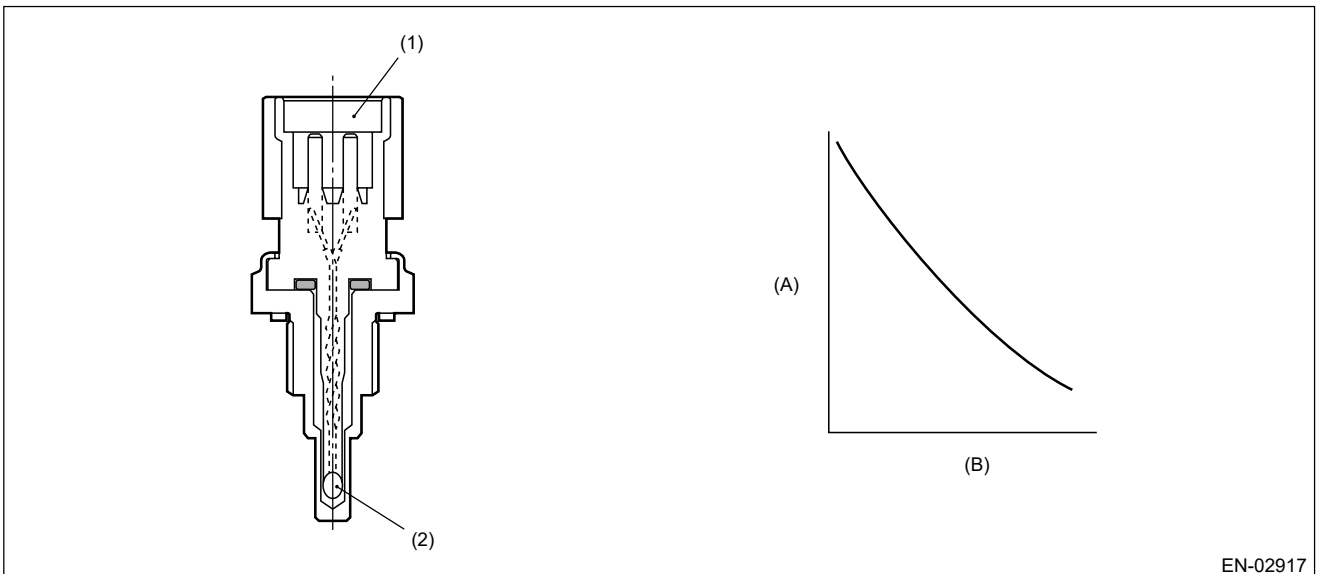
No

Replace the engine oil temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Oil Temperature Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the oil temperature sensor.
Judge as NG when outside of the judgment value.

2. COMPONENT DESCRIPTION



(A) Resistance value (k Ω)

(B) Temperature $^{\circ}\text{C}$ ($^{\circ}\text{F}$)

(1) Connector

(2) Thermistor element

EN-02917

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$\geq 4.698V$

Time needed for diagnosis: 500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0201 CYLINDER 1 INJECTOR "A" CIRCUIT


DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

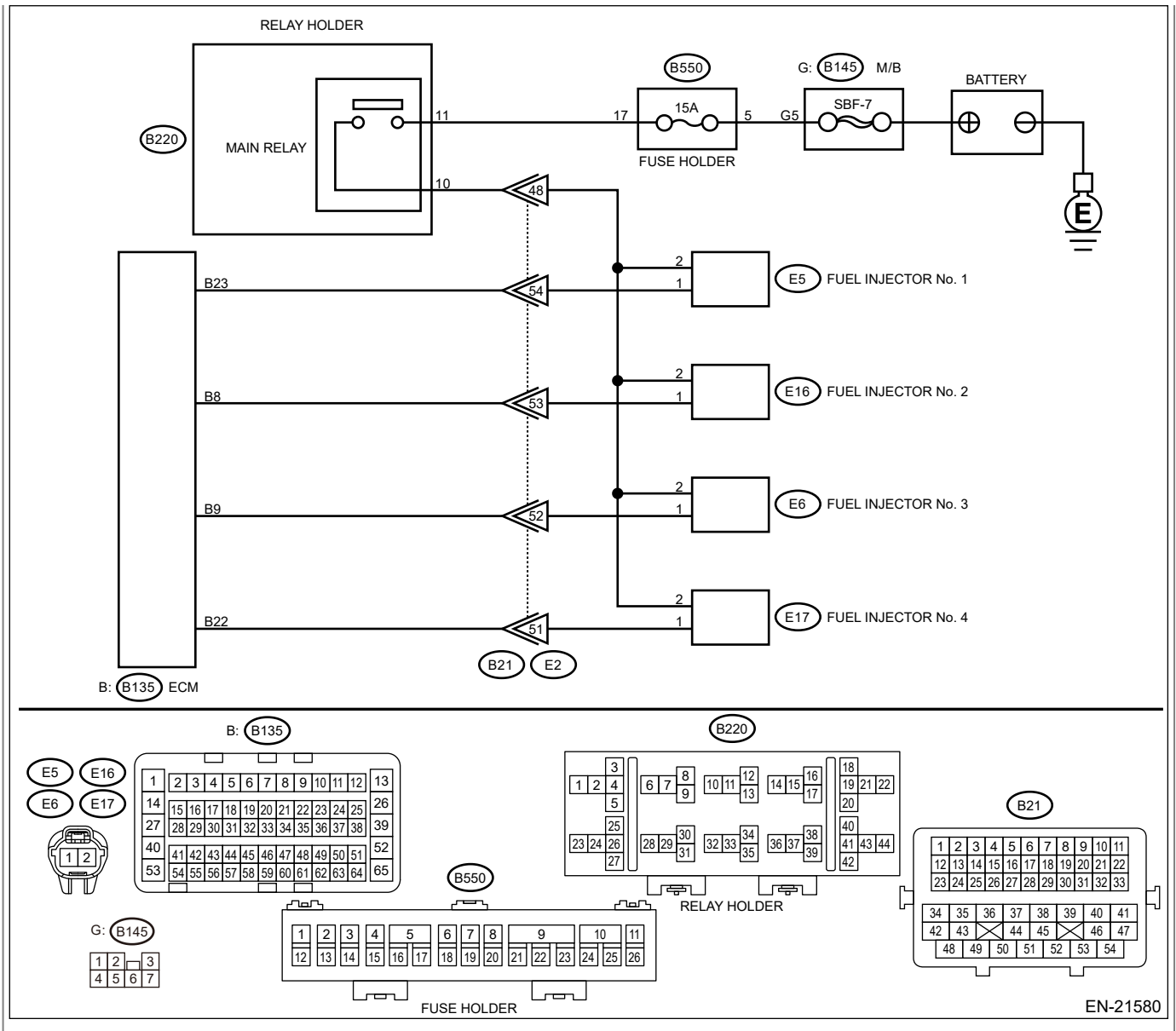
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode. and Inspection Mode !\[\]\(64ef2b19d70b31fbbfce0e0e2aa3d7b4_img.jpg\) \[Ref. to ENGINE \\(DIAGNOSTICS\\)\\(H4DO\\)>Inspection Mode.\]\(#\)](#)**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





1. CHECK POWER SUPPLY TO FUEL INJECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector.
3. Turn the ignition switch to ON.
4. Measure the voltage between fuel injector connector and the engine ground.

Connector & terminal

- DTC P0201; (E5) No. 2 (+) – Engine ground (-):
- DTC P0202; (E16) No. 2 (+) – Engine ground (-):
- DTC P0203; (E6) No. 2 (+) – Engine ground (-):
- DTC P0204; (E17) No. 2 (+) – Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between main relay and fuel injector connector**
- **Poor contact of main relay connector**
- **Poor contact of coupling connector**

2. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between fuel injector connector and engine ground.

Connector & terminal

DTC P0201; (E5) No. 1 — Engine ground:

DTC P0202; (E16) No. 1 — Engine ground:

DTC P0203; (E6) No. 1 — Engine ground:

DTC P0204; (E17) No. 1 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 3.](#)

No

Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

3. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

Measure the resistance of harness between ECM connector and fuel injector connector.

Connector & terminal

DTC P0201; (B135) No. 23 — (E5) No. 1:

DTC P0202; (B135) No. 8 — (E16) No. 1:

DTC P0203; (B135) No. 9 — (E6) No. 1:

DTC P0204; (B135) No. 22 — (E17) No. 1:

Is the resistance less than 1 Ω?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and fuel injector connector**
- **Poor contact of coupling connector**

4. CHECK FUEL INJECTOR.




Measure the resistance between fuel injector terminals on the corresponding cylinder.

Terminals

No. 1 —No. 2:

Is the resistance 5 — 20 Ω?

Yes

 [Go to 5.](#)

No

Replace the fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Injector.](#)

5. CHECK FOR POOR CONTACT.



Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes

Repair the poor contact of ECM connector.

No

 [Go to 6.](#)

6. CHECK FUEL INJECTOR OPERATION.



1. Connect all connectors.
2. Start the engine.
3. Check if the corresponding fuel injector emits operating sound.

Note:

Use a sound scope to check the operating sound.

Does the fuel injector emit operating sound?

Yes

Even if DTC is detected, the circuit has returned to a normal condition at this

time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

Repair the poor contact of fuel injector connector.

1. OUTLINE OF DIAGNOSIS

Based on the self-diagnostic result of the injector driving IC, judge the injector driving circuit as normal or abnormal.

Injector driving IC detects the status of "fuel remains injected" or "fuel is not injected" as a malfunction.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Elapsed time after starting the engine	> 1 s
Engine speed	≥ 500 rpm
Injection status	Not during fuel cut

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Injector driving IC information	Trouble


Time needed for diagnosis: 2560 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P0202 CYLINDER 2 INJECTOR "A" CIRCUIT

Note:

For the diagnostic procedure, refer to DTC P0201.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0201 CYLINDER 1 INJECTOR "A" CIRCUIT.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0201.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0201 CYLINDER 1 INJECTOR "A" CIRCUIT.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P0203 CYLINDER 3 INJECTOR "A" CIRCUIT

Note:

For the diagnostic procedure, refer to DTC P0201.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0201 CYLINDER 1 INJECTOR "A" CIRCUIT.](#)

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to DTC P0201.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0201 CYLINDER 1 INJECTOR "A" CIRCUIT.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P0204 CYLINDER 4 INJECTOR "A" CIRCUIT

Note:

For the diagnostic procedure, refer to DTC P0201.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0201 CYLINDER 1 INJECTOR "A" CIRCUIT.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0201.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0201 CYLINDER 1 INJECTOR "A" CIRCUIT.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0222 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance
- Engine stalls.

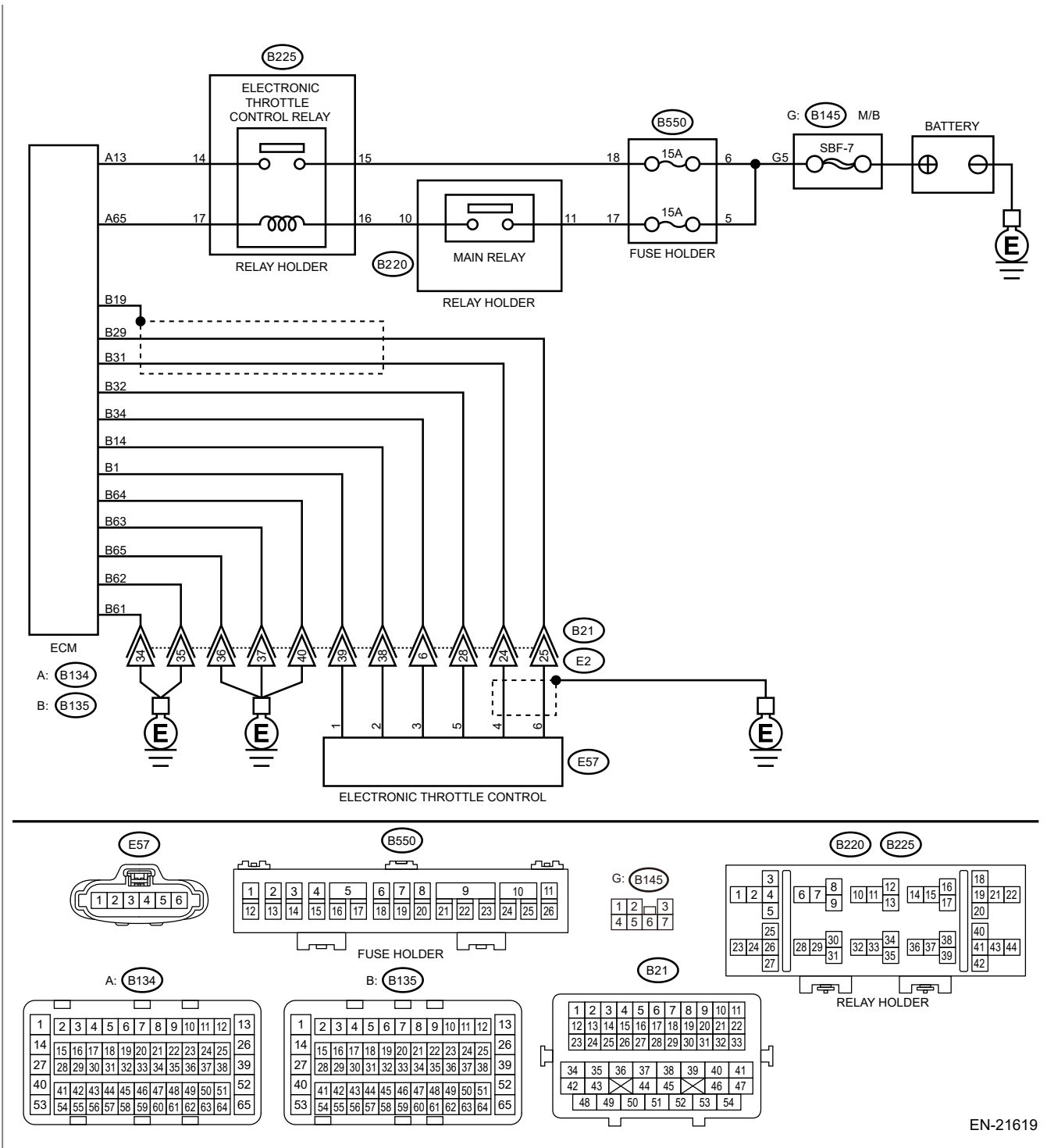
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21619

1. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from electronic throttle control.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM connector and chassis ground.



Connector & terminal


(B135) No. 32 — Chassis ground:

(B135) No. 31 — Chassis ground:

(B135) No. 31 — (B135) No. 19:

Is the resistance 1 MΩ or more?

Yes

 [Go to 2.](#)

No

Repair the ground short circuit of harness between ECM connector and electronic throttle control connector.

2. CHECK SHORT CIRCUIT INSIDE THE ECM.


1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal


(E57) No. 4 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

Replace the electronic throttle control.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Throttle Body.](#)

No

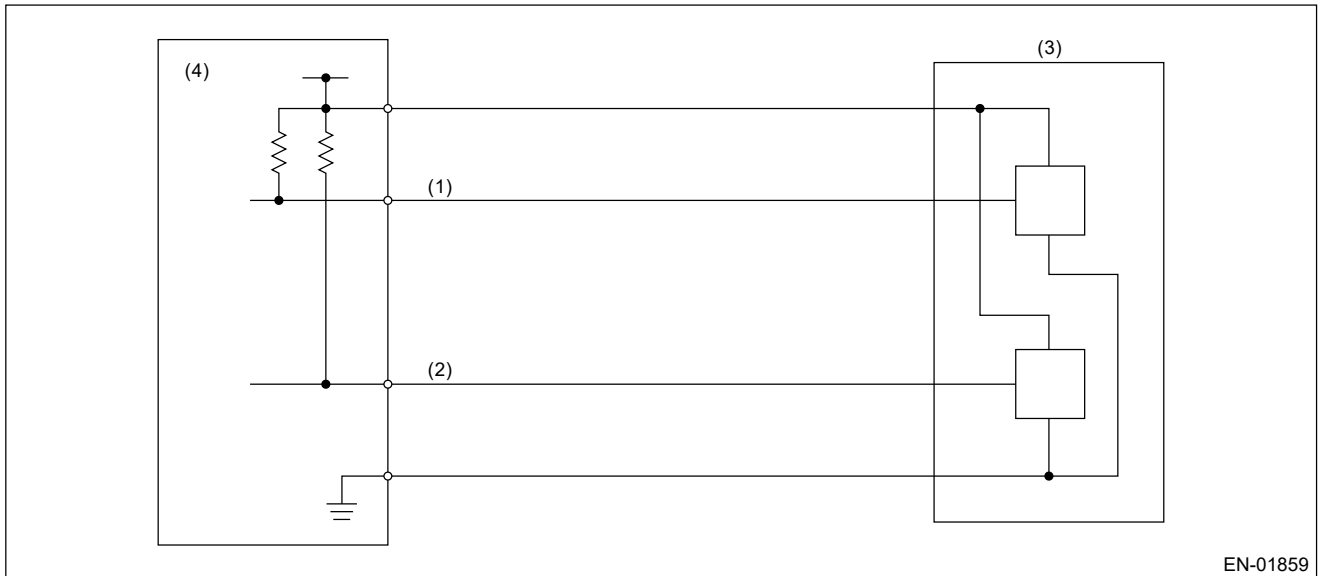
Repair the ground short circuit of harness between ECM connector and electronic throttle control connector. Replace the ECM if defective.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of throttle position sensor 2.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-01859

- (1) Throttle position sensor 1 signal (3) Throttle position sensor (4) Engine control module (ECM)
- (2) Throttle position sensor 2 signal

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 6V$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 2 input voltage	$\leq 1.134V$

Time needed for diagnosis: 24ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0223 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT HIGH



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance
- Engine stalls.

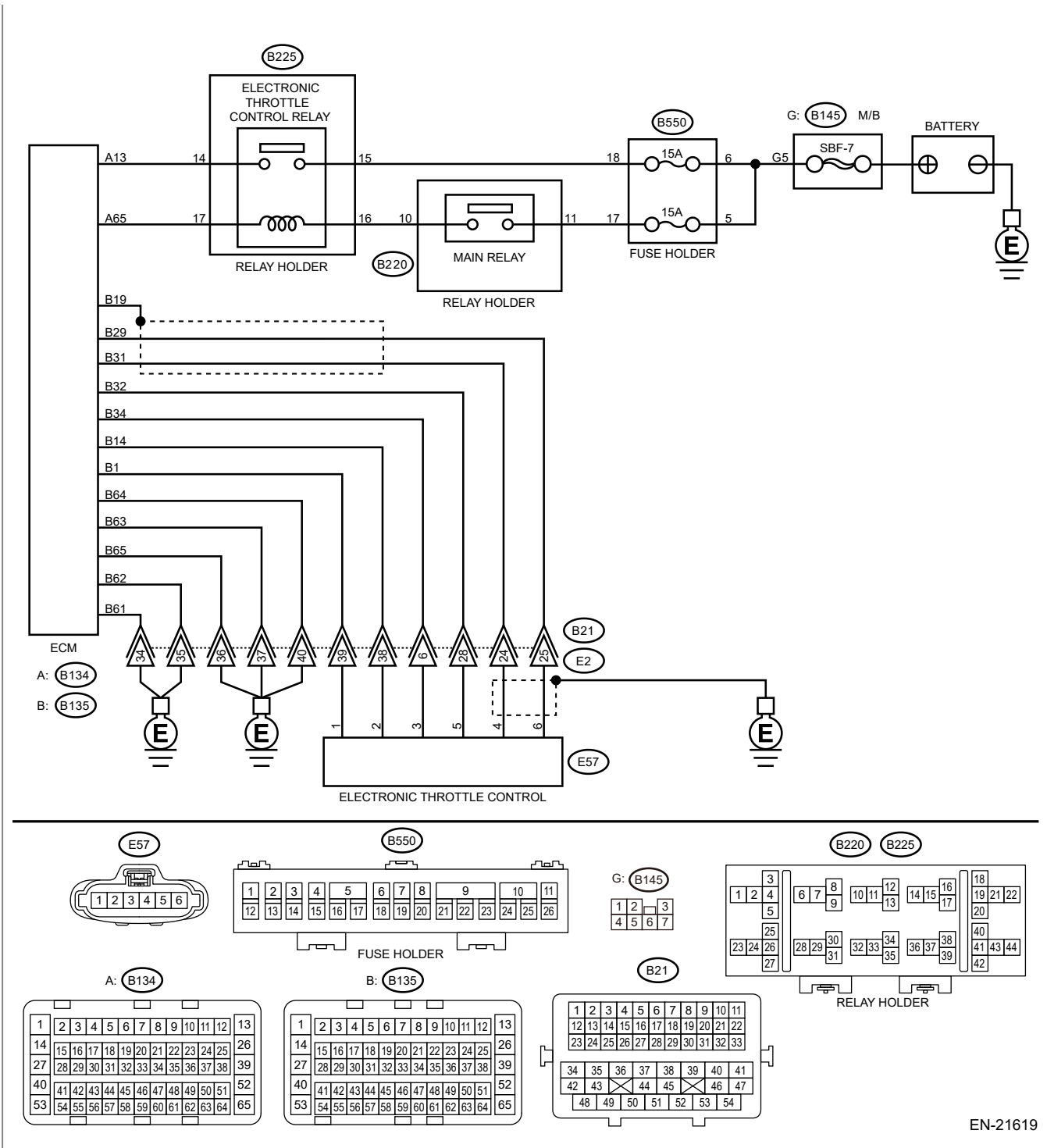
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21619

connector.


Connector & terminal

(B135) No. 31 — (E57) No. 4:

(B135) No. 18 — (E57) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 2.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and electronic throttle control connector**
- **Poor contact of coupling connector**

2. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 3 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and engine ground**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to ON.
2. Measure the voltage between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 4 (+) — Engine ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in the harness between ECM connector and electronic throttle control connector.

No

 [Go to 4.](#)

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.

Connector & terminal

(B135) No. 32 — (B134) No. 28:

Is the resistance 1 M Ω or more?

Yes

Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Throttle Body.](#)

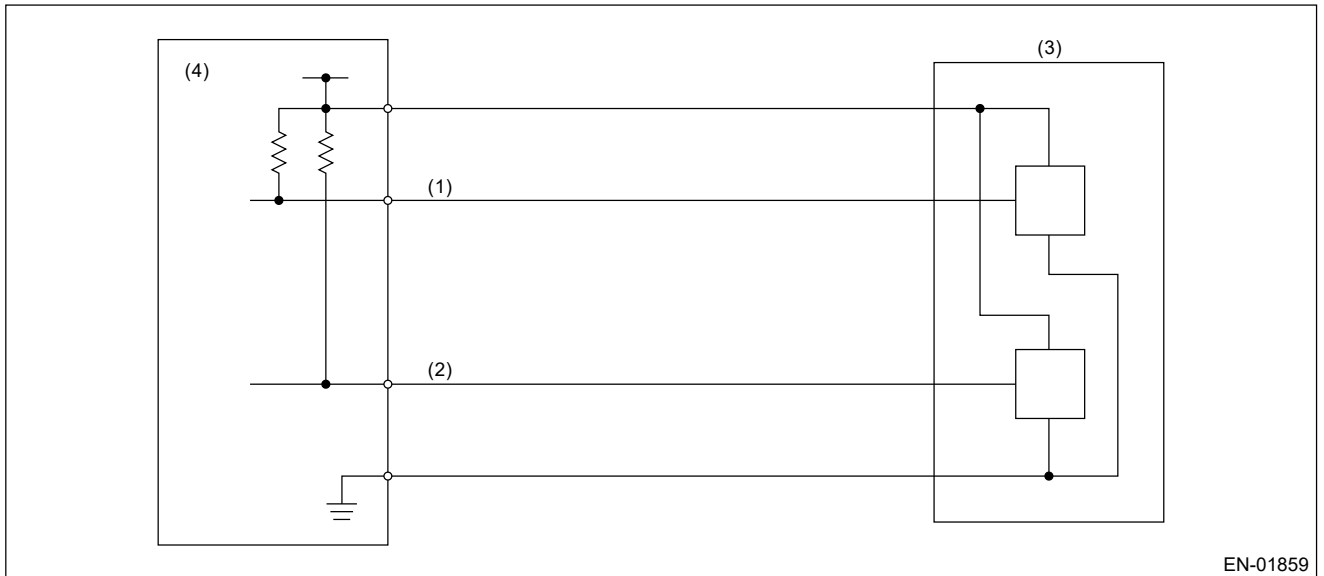
No

Repair the short circuit to power in the harness between ECM connector and electronic throttle control connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of throttle position sensor 2.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



- (1) Throttle position sensor 1 signal
- (2) Throttle position sensor 2 signal
- (3) Throttle position sensor
- (4) Engine control module (ECM)

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 6V$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 2 input voltage	$\geq 4.782V$

Time needed for diagnosis: 24ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0300 RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED



DTC detecting condition:

- Detected when two consecutive driving cycles with fault occur.
- Immediately at fault recognition (A misfire which could damage catalyst occurs.)

Trouble symptom:

- Engine stalls.
- Improper idling
- Rough driving

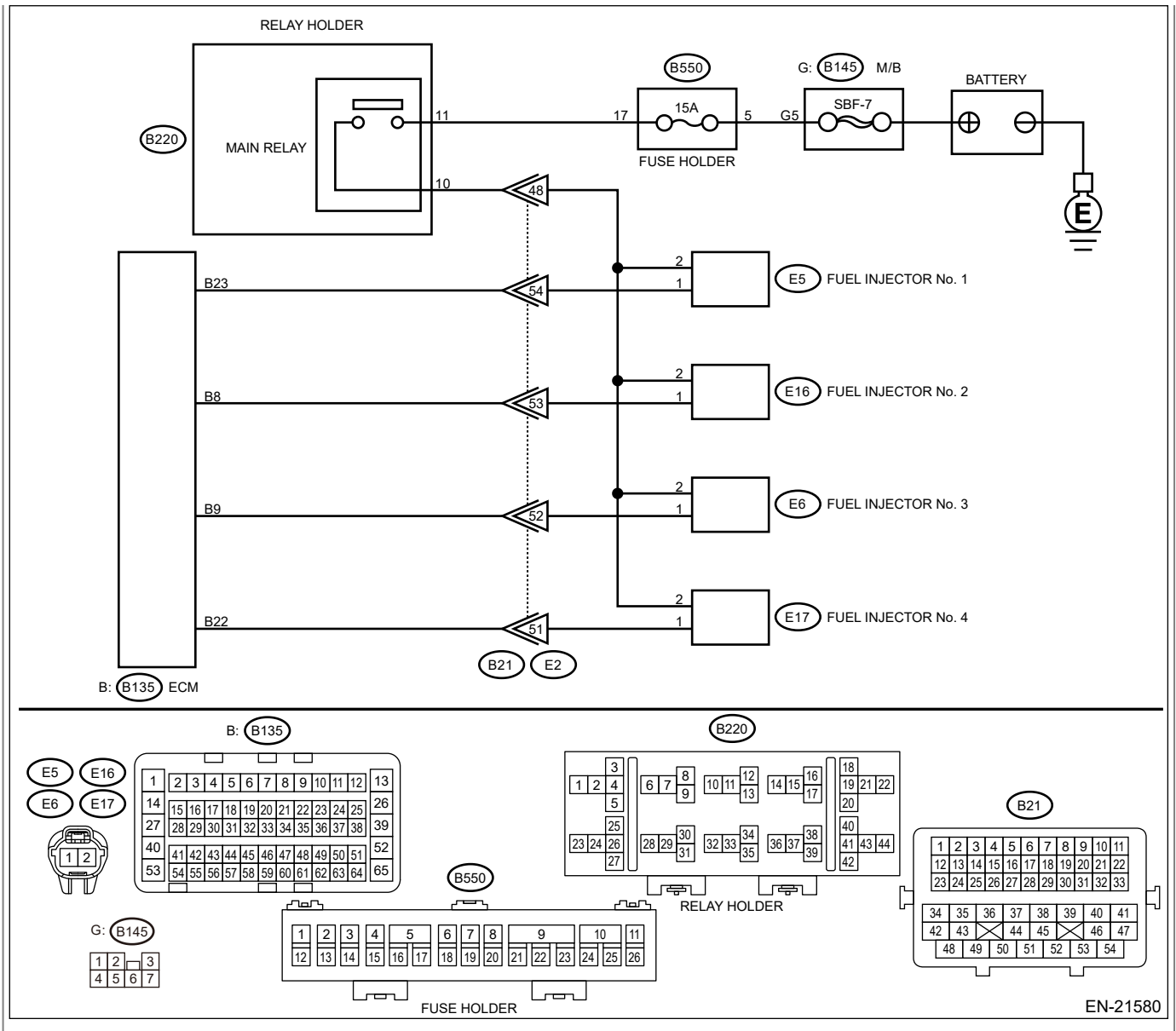
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





EN-21580

1. CHECK OUTPUT SIGNAL OF ECM.



1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and chassis ground on all cylinders.

Connector & terminal

- #1 (B135) No. 23 (+) — Chassis ground (-):
- #2 (B135) No. 8 (+) — Chassis ground (-):
- #3 (B135) No. 9 (+) — Chassis ground (-):
- #4 (B135) No. 22 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Go to 6.

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from all fuel injectors.
3. Measure the resistance between all fuel injector connectors and engine ground.

Connector & terminal

- #1 (E5) No. 1 — Engine ground:
- #2 (E16) No. 1 — Engine ground:
- #3 (E6) No. 1 — Engine ground:
- #4 (E17) No. 1 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 3.](#)

No

Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

3. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

Measure the resistance of harness between ECM and fuel injector connector on all cylinders.

Connector & terminal

- #1 (B135) No. 23 — (E5) No. 1:
- #2 (B135) No. 8 — (E16) No. 1:
- #3 (B135) No. 9 — (E6) No. 1:
- #4 (B135) No. 22 — (E17) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and fuel injector connector**
- **Poor contact of coupling connector**

4. CHECK FUEL INJECTOR.

Measure the resistance between all fuel injector terminals.

Terminals


No. 1 —No. 2:

Is the resistance 5 — 20 Ω ?

Yes

 [Go to 5.](#)

No

Replace the faulty fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Injector.](#)

5. CHECK POWER SUPPLY LINE.

1. Turn the ignition switch to ON.
2. Measure the voltage between all fuel injector connectors and the engine ground.

Connector & terminal

- #1 (E5) No. 2 (+) — Engine ground (–):
- #2 (E16) No. 2 (+) — Engine ground (–):
- #3 (E6) No. 2 (+) — Engine ground (–):
- #4 (E17) No. 2 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

Repair the poor contact of all connectors in fuel injector circuit.

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between main relay connector and fuel injector connector**
- **Poor contact of coupling connector**
- **Poor contact of main relay connector**

6. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from all fuel injectors.
3. Turn the ignition switch to ON.

4. Measure the voltage between ECM and chassis ground on all cylinders.

Connector & terminal

- #1 (B135) No. 23 (+) — Chassis ground (-):
- #2 (B135) No. 8 (+) — Chassis ground (-):
- #3 (B135) No. 9 (+) — Chassis ground (-):
- #4 (B135) No. 22 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power in harness between ECM connector and fuel injector connectors.

No

 [Go to 7.](#)

7. CHECK FUEL INJECTOR.



1. Turn the ignition switch to OFF.
2. Measure the resistance between all fuel injector terminals.

Terminals


No. 1 —No. 2:

Is the resistance 5 — 20 Ω ?

Yes

 [Go to 8.](#)

No



Replace the faulty fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Injector.](#)

8. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR/CRANKSHAFT POSITION SENSOR.



Is the camshaft position sensor or crankshaft position sensor loosely installed?

Yes

Tighten the camshaft position sensor or crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Camshaft Position Sensor>INSTALLATION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Crankshaft Position Sensor>INSTALLATION.](#)

No


 [Go to 9.](#)

9. CHECK CRANKSHAFT POSITION SENSOR PLATE.




Is the crankshaft position sensor plate rusted or does it have broken teeth?

Yes

Replace the crankshaft position sensor plate.  [Ref. to MECHANICAL\(H4DO\)>Cylinder Block.](#)

No

 [Go to 10.](#)


10. CHECK INSTALLATION CONDITION OF TIMING CHAIN.

Turn the crankshaft using ST, and align the alignment mark on crank sprocket with alignment mark on cylinder block.


ST 18252AA000 CRANKSHAFT SOCKET

Is the timing chain dislocated from its proper position?

Yes

Correct the installation condition of timing chain.  [Ref. to MECHANICAL\(H4DO\)>Timing Chain Assembly.](#)


No

 [Go to 11.](#)


11. CHECK FUEL LEVEL.

Is the fuel meter indication higher than the "Lower" level?

Yes

 [Go to 12.](#)

No

Refill the fuel so that the fuel meter indication is higher than the "Lower" level, and proceed to the next step.  [Go to 14.](#)

12. CHECK PCV VALVE.


Check the PCV valve.

Is the PCV valve free from deformation, crack or other damage?

Yes

Repair or replace the PCV valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>PCV Valve.](#)

No

 [Go to 13.](#)

13. CHECK PCV HOSE.



Check the PCV hose.

Is the PCV hose free from deformation, crack or other damage?

Yes

Repair or replace the PCV hose. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>PCV Hose.](#)

No

[Go to 14.](#)

14. CHECK STATUS OF MALFUNCTION INDICATOR LIGHT.



1. Clear the memory using the Subaru Select Monitor. [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Clear Memory Mode.](#)
2. Start the engine, and drive the vehicle 10 minutes or more.

Does the malfunction indicator light illuminate or blink?

Yes

[Go to 16.](#)

No

[Go to 15.](#)

15. CHECK CAUSE OF MISFIRE.



Was the cause of misfire identified when the engine is running?

Yes

Finish diagnostics operation, if the engine has no abnormality.

No

Repair the poor contact of connector.

Note:

In this case, repair the following item:

- **Poor contact of ignition coil connector**
- **Poor contact of fuel injector connector on faulty cylinders**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

16. CHECK AIR INTAKE SYSTEM.



Is there any fault in air intake system?

Yes


Repair the air intake system.

Note:

Check the following items.

- **Are there air leaks or air suction caused by loose or dislocated nuts and bolts?**
- **Are there cracks or any disconnection of hoses?**

No

 [Go to 17.](#)

17. CHECK ALL CYLINDERS.



Is there a fault in any cylinder?

Yes


Repair or replace the faulty part of the faulty cylinder.

Note:

Check the following items.

- **Spark plug**
- **Ignition coil**
- **Fuel injector**
- **Compression**
- **Skipping timing chain teeth**

No

Go to DTC P0171.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0171 SYSTEM TOO LEAN BANK 1.](#)

1. OUTLINE OF DIAGNOSIS

Note:

[For the detection standard, refer to DTC P0301. !\[\]\(4a7b4ce770af8456e11a71f9565c8c2b_img.jpg\) Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0301 CYLINDER 1 MISFIRE DETECTED.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0301 CYLINDER 1 MISFIRE DETECTED

Note:

For the diagnostic procedure, refer to DTC P0304.  Ref. to [ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0304 CYLINDER 4 MISFIRE DETECTED.](#)

1. OUTLINE OF DIAGNOSIS

Detect the presence of misfire occurrence. (Revolution fluctuation method)

Monitoring misfire which influences exhaust deterioration (1.5 times of FTP) and catalyst damage is made obligatory by the law. Misfire affecting these two has two patterns below:

- Intermittent misfire (the same cylinder misfires in random, or different cylinders misfire in random): FTP 1.5 times misfire
- Every time misfire (the same cylinder misfires every time): FTP 1.5 times misfire, catalyst damage misfire

The following detecting methods are adopted for these detection.

1. Intermittent misfire: FTP 1.5 times misfire
 - 180° Interval Difference Method (MT: 1800 rpm or less; CVT: None)
 - 360° Interval Difference Method (whole range)
 - 720° Interval Difference Method (3000 rpm or more)
2. Misfire every time: FTP 1.5 times misfire, catalyst damage misfire
 - 360° Interval Difference Method

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 8V
Throttle position change during 16 milliseconds	< 21° (CVT model) < 21° (MT model)
Fuel shut-off	Not in operation
Engine speed	475rpm — 6100rpm (CVT model) 500rpm — 6500rpm (MT model)
Intake manifold pressure	> Value from Map
Time elapsed after engine start	≥ 2 crankshaft revolutions
Following condition A or B is met	
A: Engine coolant temperature at engine starting	> -7°C (19°F) ≤ -7°C (19°F)

B: Following conditions (b1) and (b2) are met (b1) Engine coolant temperature at engine starting (b2) Engine coolant temperature	≥ 21°C (70°F)
--	---------------

Map (CVT model)

- Normal ignition

		Atmospheric pressure kPa (mmHg, inHg)				
		65.3 (490,19.3)	73.3 (550, 21.7)	84.9 (637, 25.1)	92 (690, 27.2)	102.4 (768,30.2)
Engine speed (rpm)	700	21 (157.5, 6.2)	22.2 (166.6, 6.6)	22.7 (170.3, 6.7)	25.3 (189.7, 7.5)	26.2 (196.5, 7.7)
	1000	19.5 (146.2, 5.8)	19.8 (148.2, 5.8)	19.8 (148.2, 5.8)	22.1 (165.9, 6.5)	23.7 (177.9, 7)
	1200	19.1 (143.3, 5.6)	19.1 (143.579, 5.7)	19.1 (143.579, 5.7)	21.7 (162.8, 6.4)	23.3 (174.554, 6.9)
	1600	17.8 (133.8, 5.3)	18.4 (137.8, 5.4)	18.7 (140.5, 5.5)	20.8 (155.8, 6.1)	22.5 (168.6, 6.6)
	2000	18.3 (130.0, 5.4)	19.1 (143.4, 5.6)	20.7 (155.3, 6.1)	21.4 (160.5, 6.3)	23.5 (176.2, 6.9)
	2400	18.4 (138.2, 5.4)	18.8 (140.9, 5.6)	20.6 (154.3, 6.1)	21.6 (161.9, 6.4)	23 (172.4, 6.8)
	2800	18.9 (141.4, 5.6)	19.7 (147.7, 5.8)	21 (157.8, 6.2)	21.6 (161.9, 6.4)	23.5 (176.1, 6.9)
	3000	19 (142.4, 5.6)	19.5 (146.0, 5.7)	21.3 (159.6, 6.3)	22.1 (165.6, 6.5)	23.8 (178.5, 7)
	3200	20.4 (153.1, 6)	21.1 (158.0, 6.2)	22.2 (166.2, 6.5)	23.2 (173.7, 6.8)	25.1 (188.5, 7.4)
	3600	21.9 (164.5, 6.5)	21.9 (165.5, 6.5)	23 (172.2, 6.8)	24.6 (184.6, 7.3)	26 (194.7, 7.7)
4000	22.8 (171.1, 6.8)	23.1 (173.5, 6.9)	23.8 (178.7, 7.1)	25.2 (189.1, 7.5)	26.4 (198.0, 7.9)	

	6.7)	6.8)	7)	7.4)	7.8)
4400	24.5 (184.0, 7.2)	24.9 (186.8, 7.4)	25.5 (191.6, 7.5)	26.9 (202.0, 8)	28.1 (210.9, 8.3)
4800	26.3 (197.0, 7.8)	26.6 (199.7, 7.9)	27.3 (204.5, 8.1)	28.7 (215.0, 8.5)	29.8 (223.8, 8.8)
5200	28 (210.0, 8.3)	28.3 (212.6, 8.4)	29 (217.4, 8.6)	30.4 (227.8, 9)	31.6 (236.7, 9.3)
5600	29.7 (222.7, 8.8)	30.1 (225.5, 8.9)	30.7 (230.3, 9.1)	32.1 (240.7, 9.5)	33.3 (249.6, 9.8)
6000	31.4 (235.6, 9.3)	31.8 (238.4, 9.4)	32.4 (243.2, 9.6)	33.8 (253.6, 10)	35 (262.5, 10.4)
6100	31.8 (238.8, 9.4)	32.2 (241.6, 9.5)	32.9 (246.5, 9.7)	34.2 (256.9, 10.1)	35.4 (265.7, 10.5)
kPa (mmHg, inHg)					

- Idling ignition

		Atmospheric pressure kPa (mmHg, inHg)				
		65.3 (490, 19.3)	73.3 (550, 21.7)	84.9 (637, 25.1)	92 (690, 27.2)	102.4 (768, 30.2)
Engine speed (rpm)	700	21.8 (163.6, 6.4)	22.7 (170.3, 6.7)	22.7 (170.3, 6.7)	25.3 (189.7, 7.5)	26.2 (196.5, 7.7)
	1000	20.1 (150.6, 5.9)	21.7 (163.1, 6.4)	22.2 (166.2, 6.5)	23.8 (178.7, 7)	26 (190. 0, 7.7)
	1200	19.4 (145.7, 5.7)	21.7 (162.8, 6.4)	20.9 (156.4, 6.2)	23.7 (177.9, 7)	25.3 (190.0, 7.5)
	1600	19 (142. 5, 5.6)	20.3 (152.1, 6)	21.5 (161.4, 6.4)	23.5 (176.2, 6.9)	25 (187. 2, 7.4)
	2000	19.3 (144.5, 5.7)	20.5 (153.6, 6)	22.5 (168.5, 6.6)	23.6 (177.3, 7)	24.7 (185.5, 7.3)
	2400	19.4 (145.3, 5.7)	20.3 (152.1, 6)	22.2 (166.8, 6.6)	23.5 (175.9, 6.9)	24.9 (187.1, 7.4)
	2800	19.3	19.7	21.6	22.8	24.2

0	(145.0, 5.7)	(147.9, 5.8)	(161.7, 6.4)	(170.9, 6.7)	(181.7, 7.2)
300	19.2 (144.0, 5.7)	19.5 (146.0, 5.7)	21.6 (162.0, 6.4)	22.7 (170.1, 6.7)	24.1 (181.1, 7.1)
320	21.1 (158.0, 6.2)	21.1 (158.0, 6.2)	22.6 (169.6, 6.7)	23.8 (178.4, 7)	25.5 (190.9, 7.5)
360	22.4 (168.3, 6.6)	22.8 (171.2, 6.7)	24.2 (181.9, 7.2)	26 (194.7, 7.7)	27.1 (203.1, 8)
400	23 (172.6, 6.8)	23.2 (173.9, 6.8)	24.8 (186.1, 7.3)	26.2 (196.7, 7.7)	27 (202.8, 8)
440	24.7 (185.5, 7.3)	24.9 (186.8, 7.4)	26.5 (199.0, 7.8)	28 (209.6, 8.3)	28.8 (215.7, 8.5)
480	26.5 (198.4, 7.8)	26.6 (199.7, 7.9)	28.2 (211.9, 8.3)	29.7 (222.5, 8.8)	30.5 (228.7, 9)
520	28.2 (211.3, 8.3)	28.3 (212.6, 8.4)	30 (224.8, 8.8)	31.4 (235.5, 9.3)	32.2 (241.6, 9.5)
560	29.9 (224.2, 8.8)	30.1 (225.5, 8.9)	31.7 (237.7, 9.4)	33.1 (248.3, 9.8)	33.9 (254.5, 10)
600	31.6 (237.1, 9.3)	31.8 (238.4, 9.4)	33.4 (250.6, 9.9)	34.8 (261.3, 10.3)	35.6 (267.4, 10.5)
610	32 (240.4, 9.5)	32.2 (241.6, 9.5)	33.8 (253.8, 10)	35.3 (264.5, 10.4)	36.1 (270.6, 10.7)
kPa (mmHg, inHg)					

Map (MT model)

- Normal ignition

		Atmospheric pressure kPa (mmHg, inHg)				
		65.3 (490, 19.3)	73.3 (550, 21.7)	84.9 (637, 25.1)	92 (690, 27.2)	102.4 (768, 30.2)
Engine speed (rpm)	700	21 (157.5, 6.2)	22.2 (166.6, 6.6)	22.7 (170.3, 6.7)	25.3 (189.7, 7.5)	26.2 (196.5, 7.7)
	1000	19.5 (146.2,	19.8 (148.2,	19.8 (148.2,	22.1 (165.9,	23.7 (177.9,

	5.8)	5.8)	5.8)	6.5)	7)
1200	19.1 (143.3, 5.6)	19.1 (143.6, 5.7)	19.1 (143.6, 5.7)	21.7 (162.8, 6.4)	23.3 (174.6, 6.9)
1600	17.8 (133.8, 5.3)	18.4 (137.8, 5.4)	18.7 (140.5, 5.5)	20.8 (155.8, 6.1)	22.5 (168.6, 6.6)
2000	18.3 (137.0, 5.4)	19.1 (143.4, 5.6)	20.7 (155.3, 6.1)	21.4 (160.5, 6.3)	23.5 (176.2, 6.9)
2400	18.4 (138.2, 5.4)	18.8 (141.0, 5.6)	20.6 (154.3, 6.1)	21.6 (161.9, 6.4)	23 (172.4, 6.8)
2800	18.9 (141.4, 5.6)	19.7 (147.7, 5.8)	21 (157.8, 6.2)	21.6 (161.9, 6.4)	23.5 (176.1, 6.9)
3000	19 (142.3, 5.6)	19.5 (146.0, 5.7)	21.3 (159.6, 6.3)	22.1 (165.6, 6.5)	23.8 (178.5, 7)
3200	20.4 (153.1, 6)	21.1 (158.0, 6.2)	22.2 (166.2, 6.5)	23.2 (173.7, 6.8)	25.1 (188.5, 7.4)
3600	21.9 (164.5, 6.5)	21.9 (164.5, 6.5)	23 (172.2, 6.8)	24.6 (184.6, 7.3)	26 (194.7, 7.7)
4000	22.8 (171.1, 6.7)	23.1 (173.5, 6.8)	23.8 (178.7, 7)	25.2 (189.1, 7.4)	26.4 (198.0, 7.8)
4400	24.5 (184.0, 7.2)	24.9 (186.8, 7.4)	25.5 (191.6, 7.5)	26.9 (202.0, 8)	28.1 (210.9, 8.3)
4800	26.3 (196.9, 7.8)	26.6 (199.7, 7.9)	27.3 (204.5, 8.1)	28.7 (214.9, 8.5)	29.8 (223.8, 8.8)
5200	28 (209.8, 8.3)	28.3 (212.6, 8.4)	29 (217.4, 8.6)	30.4 (227.8, 9)	31.6 (236.7, 9.3)
5600	29.7 (222.7, 8.8)	30.1 (225.5, 8.9)	30.7 (230.3, 9.1)	32.1 (240.7, 9.5)	33.3 (249.6, 9.8)
6000	31.4 (235.6, 9.3)	31.8 (238.4, 9.4)	32.4 (243.3, 9.6)	33.8 (253.6, 10)	35 (262.5, 10.3)
6100	31.8 (238.8,	32.2 (241.6,	32.9 (246.5,	34.2 (256.9,	35.4 (265.7,

	9.4)	9.5)	9.7)	10.1)	10.5)
kPa (mmHg, inHg)					

- Idling ignition

		Atmospheric pressure kPa (mmHg, inHg)				
		65.3 (490, 19.3)	73.3 (550, 21.7)	84.9 (637, 25.1)	92 (690, 27.2)	102.4 (768, 30.2)
Engine speed (rpm)	700	21.8 (163.6, 6.4)	22.7 (170.3, 6.7)	22.7 (170.3, 6.7)	25.3 (189.7, 7.5)	26.2 (196.5, 7.7)
	1000	20.1 (150.6, 5.9)	21.7 (163.1, 6.4)	22.2 (166.2, 6.5)	23.8 (178.7, 7)	26 (195.0, 7.7)
	1200	19.4 (145.7, 5.7)	20.9 (156.4, 6.2)	21.7 (162.8, 6.4)	23.7 (177.9, 7)	25.3 (190.0, 7.5)
	1600	19 (142.5, 5.6)	20.3 (152.1, 6)	21.5 (161.4, 6.4)	23.5 (176.2, 6.9)	25 (187.2, 7.4)
	2000	19.3 (144.5, 5.7)	20.5 (153.6, 6)	22.5 (168.5, 6.6)	23.6 (177.3, 7)	24.7 (185.5, 7.3)
	2400	19.4 (145.3, 5.7)	20.3 (152.1, 6)	22.2 (166.8, 6.6)	23.5 (175.9, 6.9)	24.9 (187.1, 7.4)
	2800	19.3 (145.0, 5.7)	19.7 (147.9, 5.8)	21.6 (161.7, 6.4)	22.8 (170.9, 6.7)	24.2 (181.7, 7.2)
	3000	19.2 (144.0, 5.7)	19.5 (146.0, 5.7)	21.6 (162.0, 6.4)	22.7 (170.1, 6.7)	24.1 (181.1, 7.1)
	3200	21.1 (158.0, 6.2)	21.1 (158.0, 6.2)	22.6 (169.6, 6.7)	23.8 (178.4, 7)	25.5 (190.9, 7.5)
	3600	22.4 (168.3, 6.6)	22.8 (171.2, 6.7)	24.2 (181.9, 7.2)	26 (194.7, 7.7)	27.1 (203.1, 8)
	4000	23 (172.6, 6.8)	23.2 (173.9, 6.8)	24.8 (186.1, 7.3)	26.2 (196.7, 7.7)	27 (202.8, 8)
	4400	24.7 (185.5, 7.3)	24.9 (186.8, 7.4)	26.5 (199.0, 7.8)	28 (209.6, 8.3)	28.8 (215.7, 8.5)
4800	26.5	26.6	28.2	29.7	30.5	

0	(198.4, 7.8)	(199.7, 7.9)	(211.9, 8.3)	(222.5, 8.8)	(228.7, 9)
520 0	28.2 (211.3, 8.3)	28.3 (212.6, 8.4)	30 (224.8, 8.8)	31.4 (235.5, 9.3)	32.2 (241.6, 9.5)
560 0	29.9 (224.2, 8.8)	30.1 (225.5, 8.9)	31.7 (237.7, 9.4)	33.1 (248.4, 9.8)	33.9 (254.5, 10)
600 0	31.6 (237.1, 9.3)	31.8 (238.4, 9.4)	33.4 (250.6, 9.9)	34.8 (261.3, 10.3)	35.6 (267.4, 10.5)
610 0	32 (240.4, 9.5)	32.2 (241.6, 9.5)	33.8 (253.8, 10)	35.3 (264.5, 10.4)	36.1 (270.6, 10.7)
kPa (mmHg, inHg)					

3. GENERAL DRIVING CYCLE

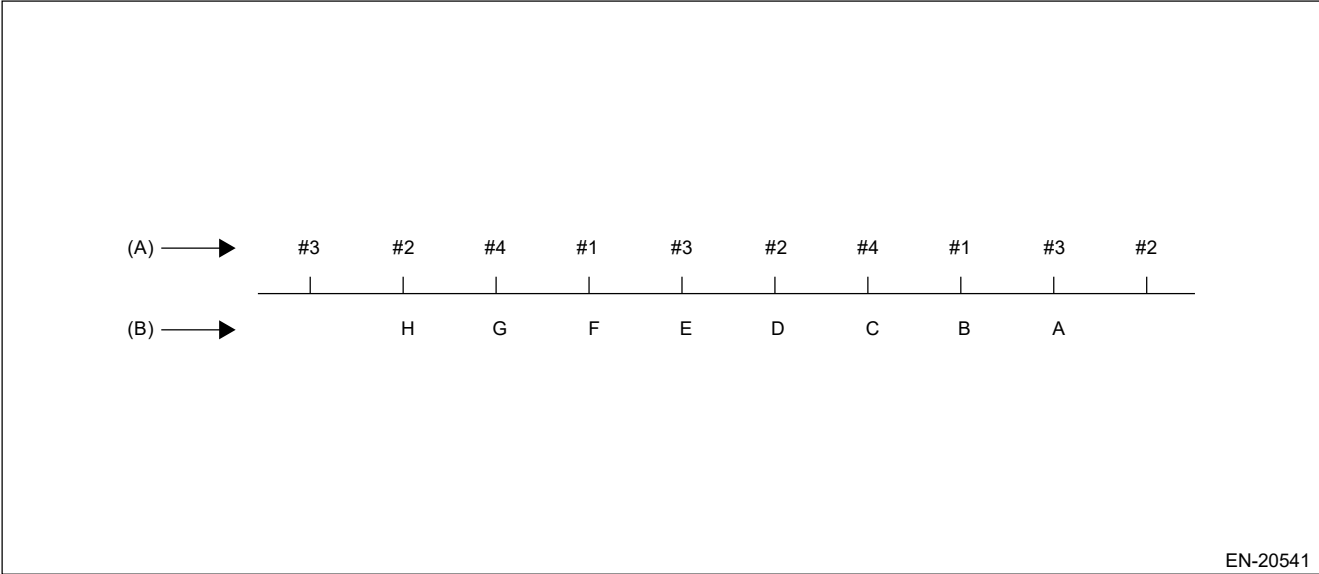
- If conditions are met, it is possible to detect the misfires from idling to high engine speed. However, in case any engine load or breakage occurs, perform with the engine at idle.
- Perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

When a misfire occurs, the engine speed will decrease and the crankshaft position speed will change. Calculate the interval difference value (diagnostic value) from crankshaft position speed by the following formula, and judge whether a misfire is occurring or not comparing the calculated result with judgment value. Count the number of misfires, if the misfire ratio is higher during 1000 revs. or 200 revs., judge corresponding cylinders as NG.

Diagnostic value calculation (Calculate from angle speed) →	Misfire detection every single ignition (Compare diagnostic value with judgment value) →	NG judgment (Misfire occurrence judgment required by the law) (Compare number of misfire with judgment value)
	<ul style="list-style-type: none"> • 180 Degree Interval Difference Method • 360 Degree Interval Difference Method • 720 Degree Interval Difference Method 	<ul style="list-style-type: none"> • FTP 1.5 times misfire NG judgment • NG judgment for catalyst-damaging misfire

As shown in the following figure, pick a cylinder as the standard and name it A. And the former crankshaft position speed is named B, the second former crankshaft position speed is named C, the third is named D, etc.



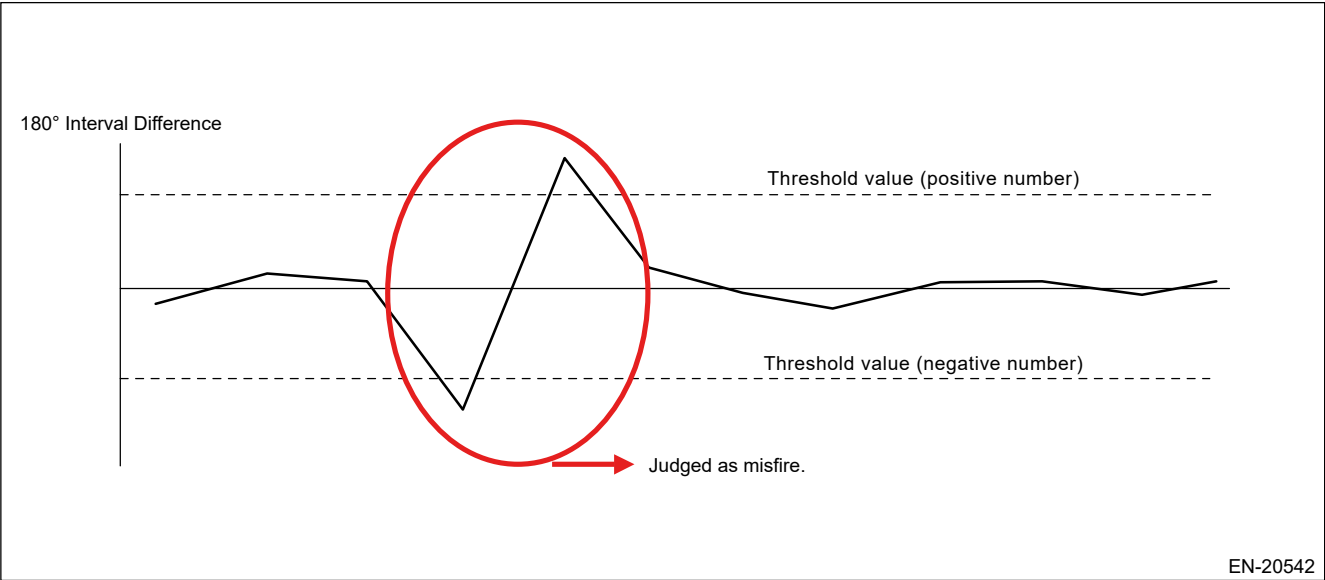
EN-20541

(A) Ignition order

(B) Crankshaft position speed

180° INTERVAL DIFFERENCE METHOD

Diagnostic c value	180 degree interval difference = $(B - A) - (F - B)/4$
Judge as a misfire in the following cases. <ul style="list-style-type: none"> • 180 degree interval difference > Judgment value of positive side • 180 degree interval difference ≤ Judgment value of negative side (Diagnostic value before 180° CA)	

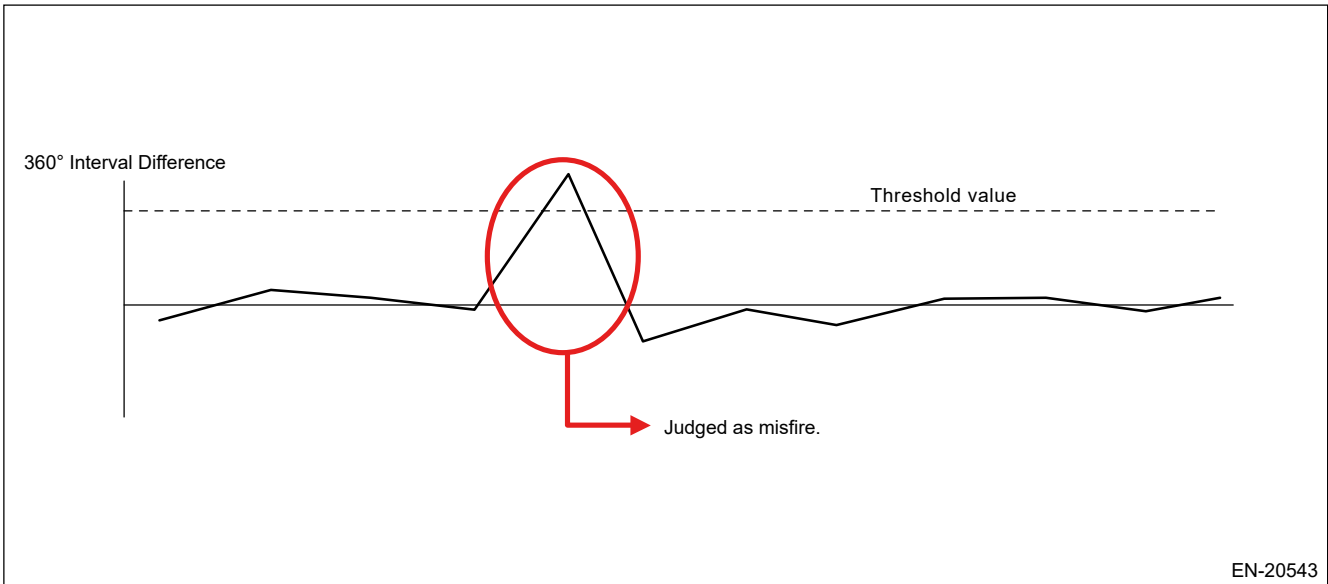


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360° INTERVAL DIFFERENCE METHOD

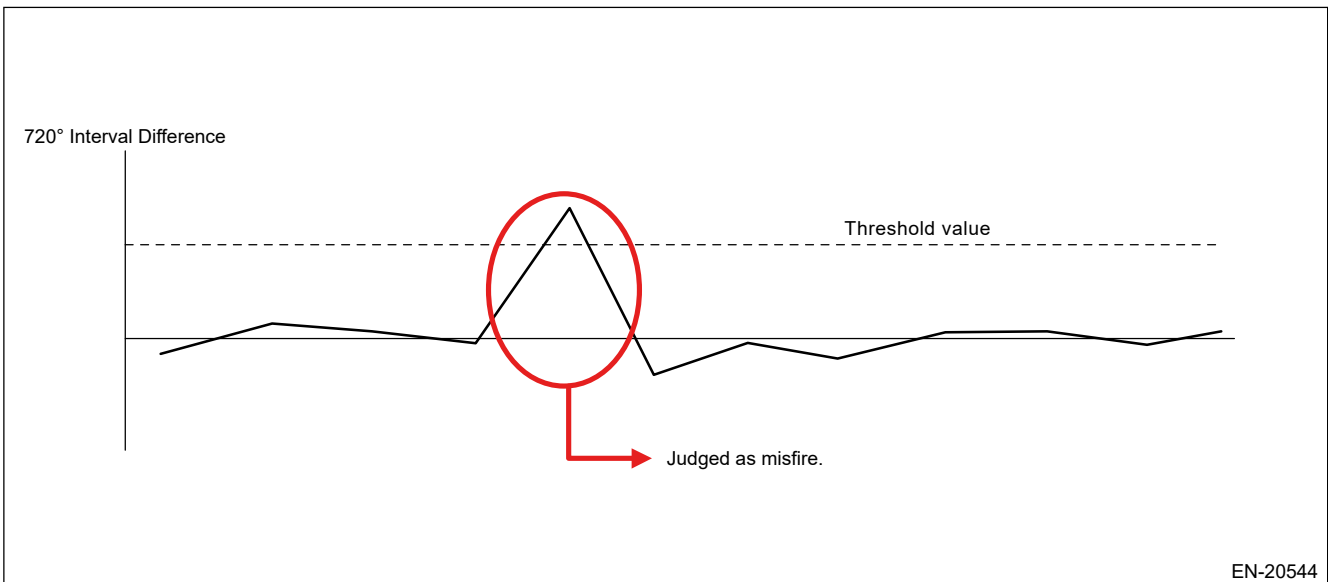
Diagnostic value	360 degree interval difference = $(B - A) - (D - C)$
Misfire	360 degree interval difference >

judgment	Judgment value → Judged as misfire
----------	------------------------------------



720° INTERVAL DIFFERENCE METHOD

Diagnostic value	720 degree interval difference = (B - A) - (E - F)
Misfire judgment	720 degree interval difference > Judgment value: → Judged as misfire



FTP 1.5 TIMES MISFIRE (MISFIRE OCCURRENCE LEVEL WHICH INFLUENCES EXHAUST GAS)

Judgment value (Judge that malfunction occurs when the misfire ratio is high in 1000 engine revs.)

Malfunction Criteria	Threshold Value
FTP emission diagnostic value	$\geq 34 \times 100/2000\%$

(CVT model)	in 1000 revs.
FTP emission diagnostic value (MT model)	≥40× 100/2000% in 1000 revs.

Time needed for diagnosis: 1000 engine revs.

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

CATALYST-DAMAGING MISFIRE (MISFIRE OCCURRENCE LEVEL THAT WILL DAMAGE CATALYST)

Judgment value

Malfunction Criteria	Threshold Value
Catalyst-damaging misfire diagnostic value	≥ Value of Map 2

Map 2

		Intake air g/rev (oz/rev)							
		0.2 (0.01)	0.3 (0.01)	0.4 (0.01)	0.5 (0.02)	0.6 (0.02)	0.8 (0.03)	0.9 (0.03)	1.1 (0.04)
Engine speed (rpm)	650	100	100	100	100	100	80	64	48
	1000	100	100	100	80	80	80	52	24
	1500	100	100	80	80	80	57	36	26
	2000	80	80	80	80	80	44	26	26
	2500	68	68	68	58	58	35	26	26
	3000	57	57	57	36	36	26	26	26
	3500	55	46	42	30	28	20	20	20
	4000	55	36	26	20	20	20	20	20
	4500	50	28	20	20	20	20	20	20
	5000	50	20	20	20	20	20	20	20
	5500	40	20	20	20	20	20	20	20
	6000	40	20	20	20	20	20	20	20
6400	40	20	20	20	20	20	20	20	

Time needed for diagnosis: 200 engine revs.

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P0302 CYLINDER 2 MISFIRE DETECTED

Note:

For the diagnostic procedure, refer to DTC P0304.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0304 CYLINDER 4 MISFIRE DETECTED.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0301.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0301 CYLINDER 1 MISFIRE DETECTED.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P0303 CYLINDER 3 MISFIRE DETECTED

Note:

For the diagnostic procedure, refer to DTC P0304.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0304 CYLINDER 4 MISFIRE DETECTED.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0301.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0301 CYLINDER 1 MISFIRE DETECTED.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0304 CYLINDER 4 MISFIRE DETECTED



DTC detecting condition:

- Detected when two consecutive driving cycles with fault occur.
- Immediately at fault recognition (A misfire which could damage catalyst occurs.)

Trouble symptom:

- Engine stalls.
- Improper idling
- Rough driving

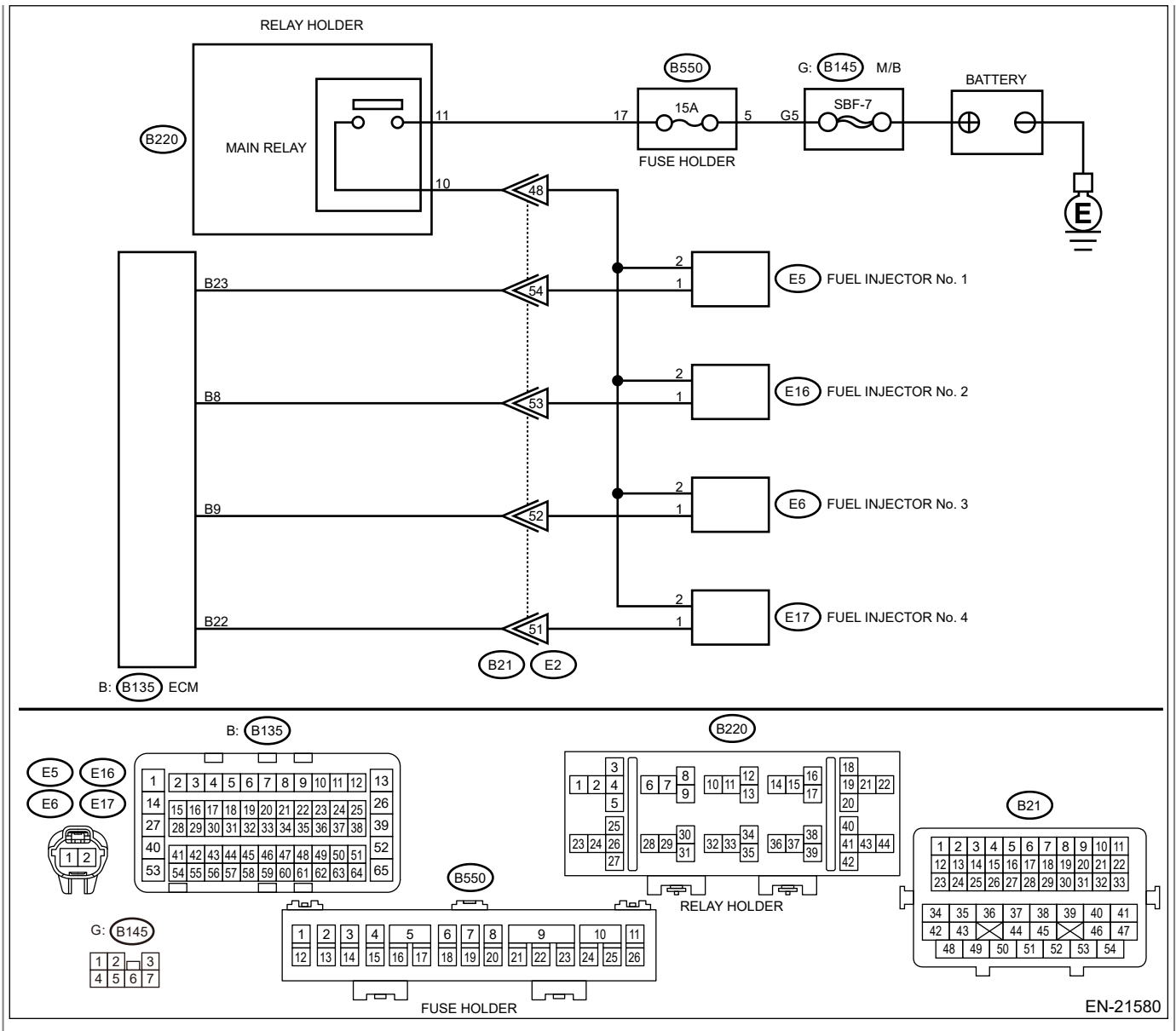
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





1. CHECK OUTPUT SIGNAL OF ECM.



1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and chassis ground on faulty cylinders.

Connector & terminal


- #1 (B135) No. 23 (+) — Chassis ground (-):
- #2 (B135) No. 8 (+) — Chassis ground (-):
- #3 (B135) No. 9 (+) — Chassis ground (-):
- #4 (B135) No. 22 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

[Go to 6.](#)

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector on faulty cylinders.
3. Measure the resistance between fuel injector connector and engine ground on faulty cylinders.

Connector & terminal

- #1 (E5) No. 1 — Engine ground:
- #2 (E16) No. 1 — Engine ground:
- #3 (E6) No. 1 — Engine ground:
- #4 (E17) No. 1 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 3.](#)

No

Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

3. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.


Measure the resistance of harness between ECM and fuel injector connector on faulty cylinders.

Connector & terminal

- #1 (B135) No. 23 — (E5) No. 1:
- #2 (B135) No. 8 — (E16) No. 1:
- #3 (B135) No. 9 — (E6) No. 1:
- #4 (B135) No. 22 — (E17) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and fuel injector connector**

- **Poor contact of coupling connector**

4. CHECK FUEL INJECTOR.

Measure the resistance between fuel injector terminals on faulty cylinder.

Terminals


No. 1 —No. 2:

Is the resistance 5 — 20 Ω ?

Yes

 [Go to 5.](#)

No

Replace the faulty fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Injector.](#)

5. CHECK POWER SUPPLY LINE.

1. Turn the ignition switch to ON.
2. Measure the voltage between fuel injector and engine ground on faulty cylinders.

Connector & terminal

#1 (E5) No. 2 (+) — Engine ground (–):

#2 (E16) No. 2 (+) — Engine ground (–):

#3 (E6) No. 2 (+) — Engine ground (–):

#4 (E17) No. 2 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

Repair the poor contact of all connectors in fuel injector circuit.

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between the main relay connector and fuel injector connector on faulty cylinders**
- **Poor contact of coupling connector**
- **Poor contact of main relay connector**

6. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

1. Turn the ignition switch to OFF.

2. Disconnect the connector from fuel injector on faulty cylinders.
3. Turn the ignition switch to ON.
4. Measure the voltage between ECM and chassis ground on faulty cylinders.

Connector & terminal

- #1 (B135) No. 23 (+) — Chassis ground (-):
- #2 (B135) No. 8 (+) — Chassis ground (-):
- #3 (B135) No. 9 (+) — Chassis ground (-):
- #4 (B135) No. 22 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power in harness between ECM connector and fuel injector connectors.

No

 [Go to 7.](#)

7. CHECK FUEL INJECTOR.



1. Turn the ignition switch to OFF.
2. Measure the resistance between fuel injector terminals on faulty cylinder.

Terminals


No. 1 —No. 2:

Is the resistance 5 — 20 Ω ?

Yes

 [Go to 8.](#)

No



Replace the faulty fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Injector.](#)

8. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR/CRANKSHAFT POSITION SENSOR.



Is the camshaft position sensor or crankshaft position sensor loosely installed?

Yes

Tighten the camshaft position sensor or crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Camshaft Position Sensor>INSTALLATION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Crankshaft Position Sensor>INSTALLATION.](#)


No

 [Go to 9.](#)


9. CHECK CRANKSHAFT POSITION SENSOR PLATE.

Is the crankshaft position sensor plate rusted or does it have broken teeth?

Yes

Replace the crankshaft position sensor plate.  [Ref. to MECHANICAL\(H4DO\)>Cylinder Block.](#)

No

 [Go to 10.](#)


10. CHECK INSTALLATION CONDITION OF TIMING CHAIN.

Turn the crankshaft using ST, and align the alignment mark on crank sprocket with alignment mark on cylinder block.


ST 18252AA000 CRANKSHAFT SOCKET

Is the timing chain dislocated from its proper position?

Yes

Correct the installation condition of timing chain.  [Ref. to MECHANICAL\(H4DO\)>Timing Chain Assembly.](#)

No

 [Go to 11.](#)


11. CHECK FUEL LEVEL.

Is the fuel meter indication higher than the "Lower" level?

Yes

 [Go to 12.](#)

No

Refill the fuel so that the fuel meter indication is higher than the "Lower" level, and proceed to the next step.  [Go to 14.](#)

12. CHECK PCV VALVE.


Check the PCV valve.

Is the PCV valve free from deformation, crack or other damage?

Yes

Repair or replace the PCV valve.

No

 [Go to 13.](#)

13. CHECK PCV HOSE.




Check the PCV hose.

Is the PCV hose free from deformation, crack or other damage?

Yes


Check the PCV hose assembly for cracks, damage or looseness.

No

 [Go to 14.](#)


14. CHECK STATUS OF MALFUNCTION INDICATOR LIGHT.




1. Clear the memory using the Subaru Select Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Clear Memory Mode.](#)
2. Start the engine, and drive the vehicle 10 minutes or more.

Does the malfunction indicator light illuminate or blink?

Yes

 [Go to 16.](#)

No

 [Go to 15.](#)

15. CHECK CAUSE OF MISFIRE.



Was the cause of misfire identified when the engine is running?

Yes

Finish diagnostics operation, if the engine has no abnormality.

No

Repair the poor contact of connector.

Note:

In this case, repair the following item:

- **Poor contact of ignition coil connector**
- **Poor contact of fuel injector connector on faulty cylinders**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

16. CHECK AIR INTAKE SYSTEM.



Is there any fault in air intake system?

Yes


Repair the air intake system.

Note:

Check the following items.

- **Are there air leaks or air suction caused by loose or dislocated nuts and bolts?**
- **Are there cracks or any disconnection of hoses?**

No

 [Go to 17.](#)

17. CHECK CYLINDER.



Is there any fault in the cylinder?

Yes


Repair or replace faulty parts.

Note:

Check the following items.


- **Spark plug**
- **Ignition coil**
- **Fuel injector**
- **Compression**
- **Skipping timing chain teeth**

No

Go to DTC P0171.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0171 SYSTEM TOO LEAN BANK 1.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0301.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0301 CYLINDER 1 MISFIRE DETECTED.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0327 KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT LOW BANK 1 OR SINGLE SENSOR



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

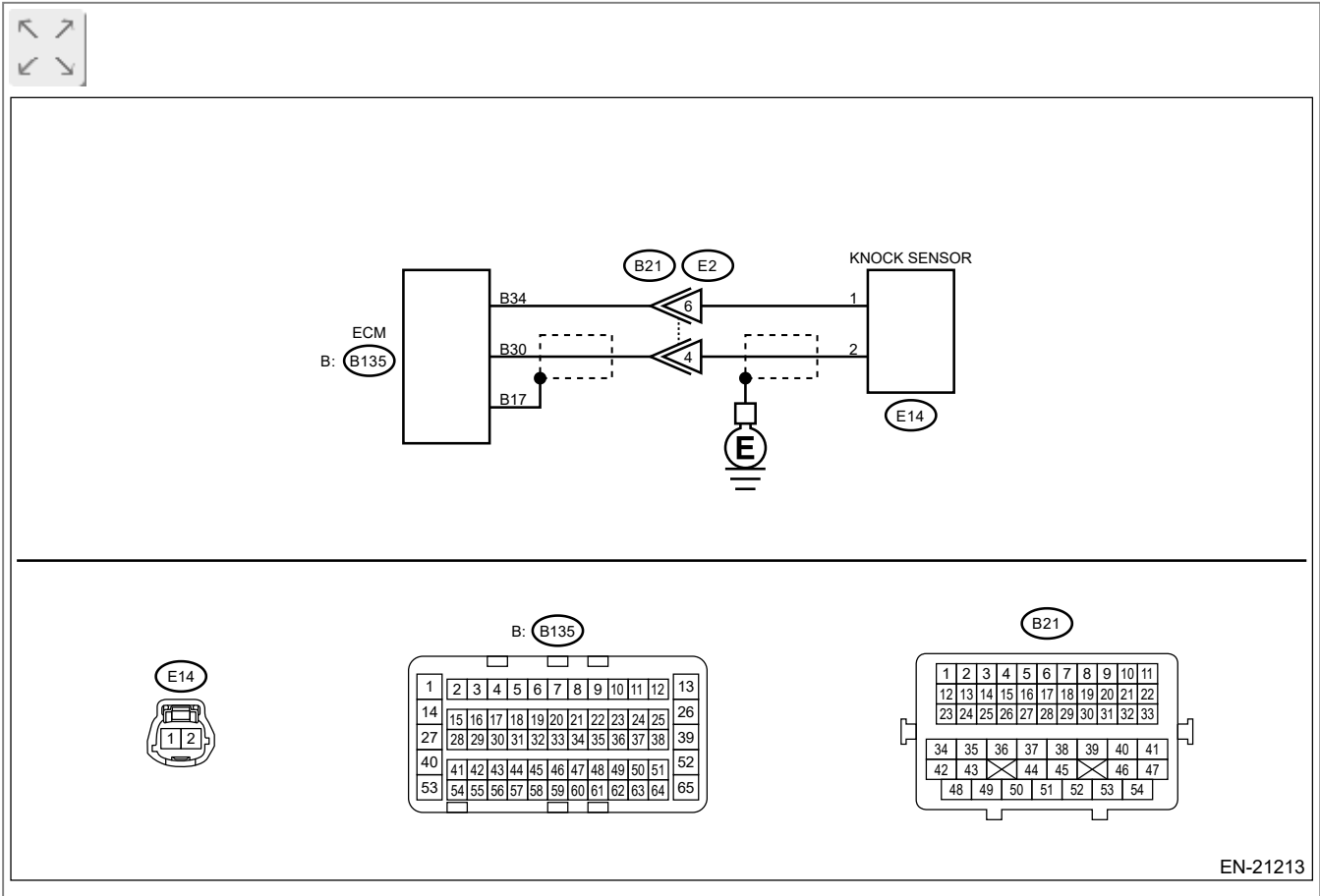
- Poor driving performance
- Knocking occurs

Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



EN-21213

1. CHECK HARNESS BETWEEN ECM AND KNOCK SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.


2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.

Connector & terminal

(B136) No. 28 — (B134) No. 29:

Is the resistance less than 500 k Ω ?

Yes

 [Go to 2.](#)

No

 [Go to 3.](#)

2. CHECK KNOCK SENSOR.




1. Disconnect the connector from the knock sensor.
2. Measure the resistance between knock sensor terminals.

Terminals

No. 1 —No. 2:

Is the resistance less than 500 k Ω ?

Yes

Replace the knock sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Knock Sensor.](#)

No

Repair the short circuit to ground in harness between ECM connector and knock sensor connector.

Note:

The harness between both connectors are shielded. Remove the shield and repair the short circuit of harness.

3. CHECK INPUT SIGNAL OF ECM.



1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B135) No. 30 (+) — Chassis ground (-):

Is the voltage 2 V or more?

Yes

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

Repair the short circuit to ground in harness between ECM connector and knock sensor connector.

Note:

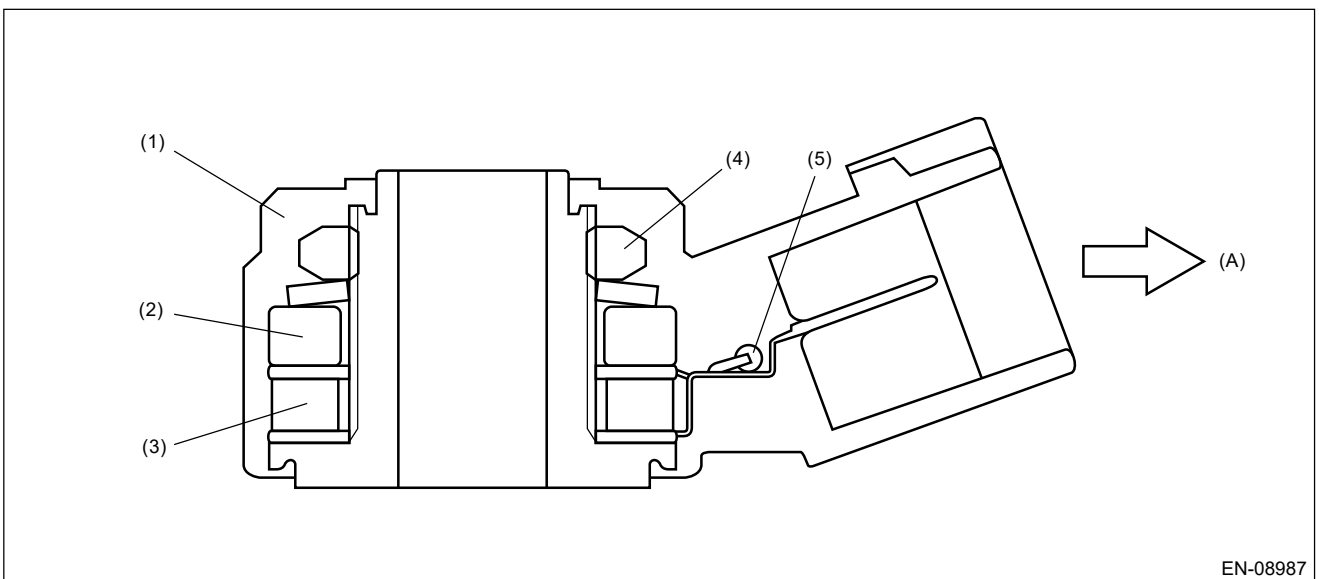
The harness between both connectors are shielded. Remove the shield and repair the short circuit of harness.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of knock sensor.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(A) To knock sensor harness

(1) Case

(3) Piezoelectric element

(5) Resistance

(2) Weight

(4) Nut

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
----------------------	-----------------

Output voltage	< 0.278V
----------------	----------

Time needed for diagnosis: 1000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0328 KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT HIGH BANK 1 OR SINGLE SENSOR



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

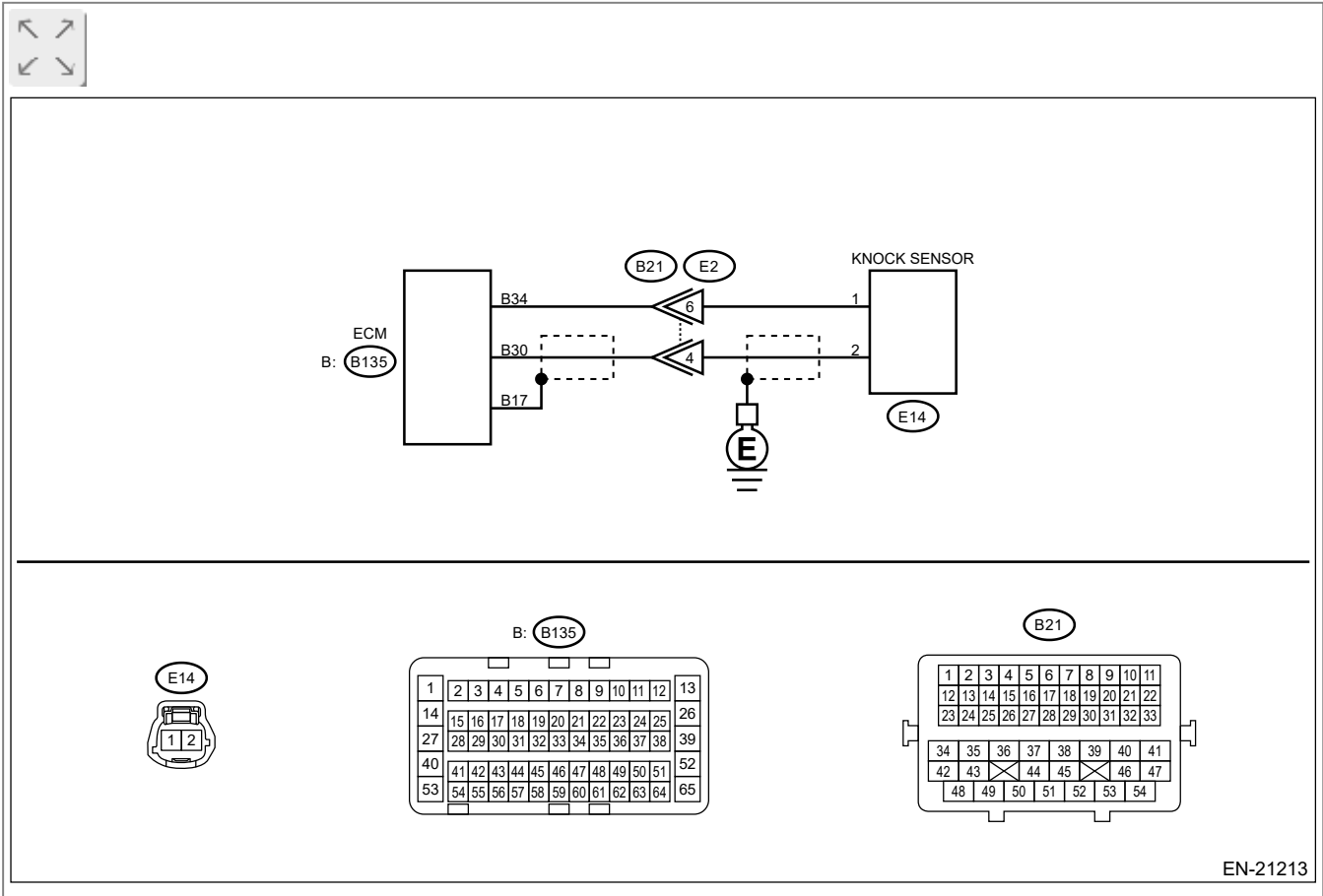
- Poor driving performance
- Knocking occurs

Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



EN-21213

1. CHECK HARNESS BETWEEN ECM AND KNOCK SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.




2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.

Connector & terminal

(B135) No. 30 — (B134) No. 29:

Is the resistance 600 kΩ or more?

Yes

 [Go to 2.](#)

No

Repair the poor contact of ECM connector.

2. CHECK KNOCK SENSOR.




1. Disconnect the connector from the knock sensor.
2. Measure the resistance between knock sensor terminals.

Terminals

No. 1 —No. 2:

Is the resistance 600 kΩ or more?

Yes

Replace the knock sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Knock Sensor.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

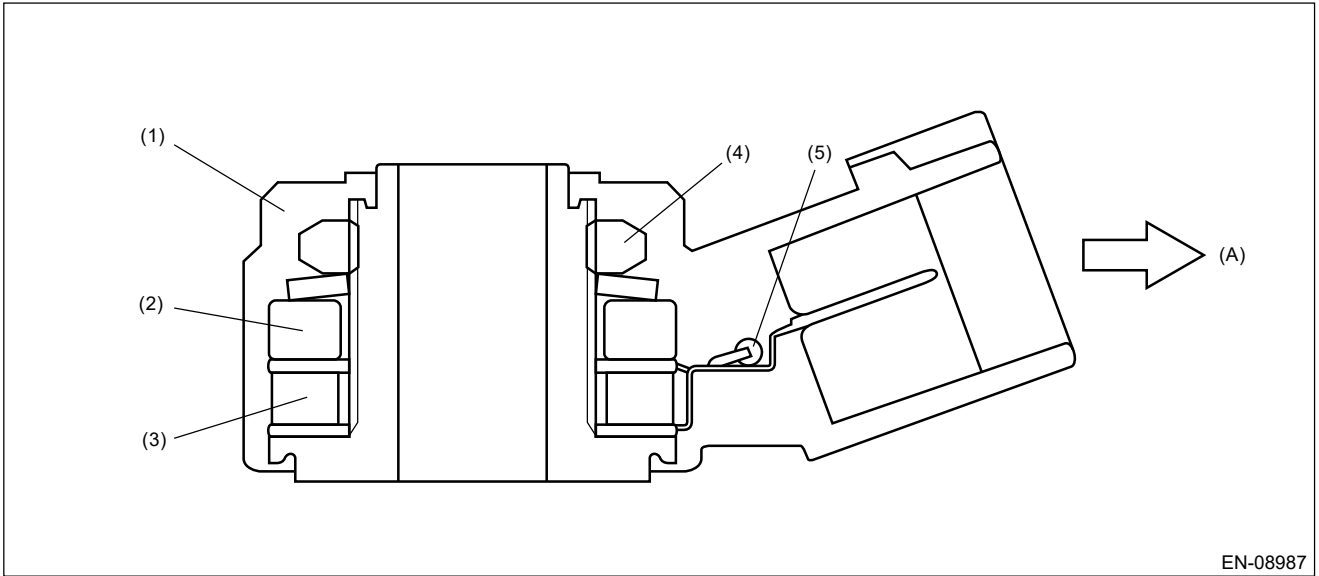
- **Open circuit in harness between ECM connector and knock sensor connector**
- **Poor contact of knock sensor connector**
- **Poor contact of coupling connector**

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of knock sensor.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(A) To knock sensor harness

(1) Case

(3) Piezoelectric element

(5) Resistance

(2) Weight

(4) Nut

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$\geq 4.591V$

Time needed for diagnosis: 1000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

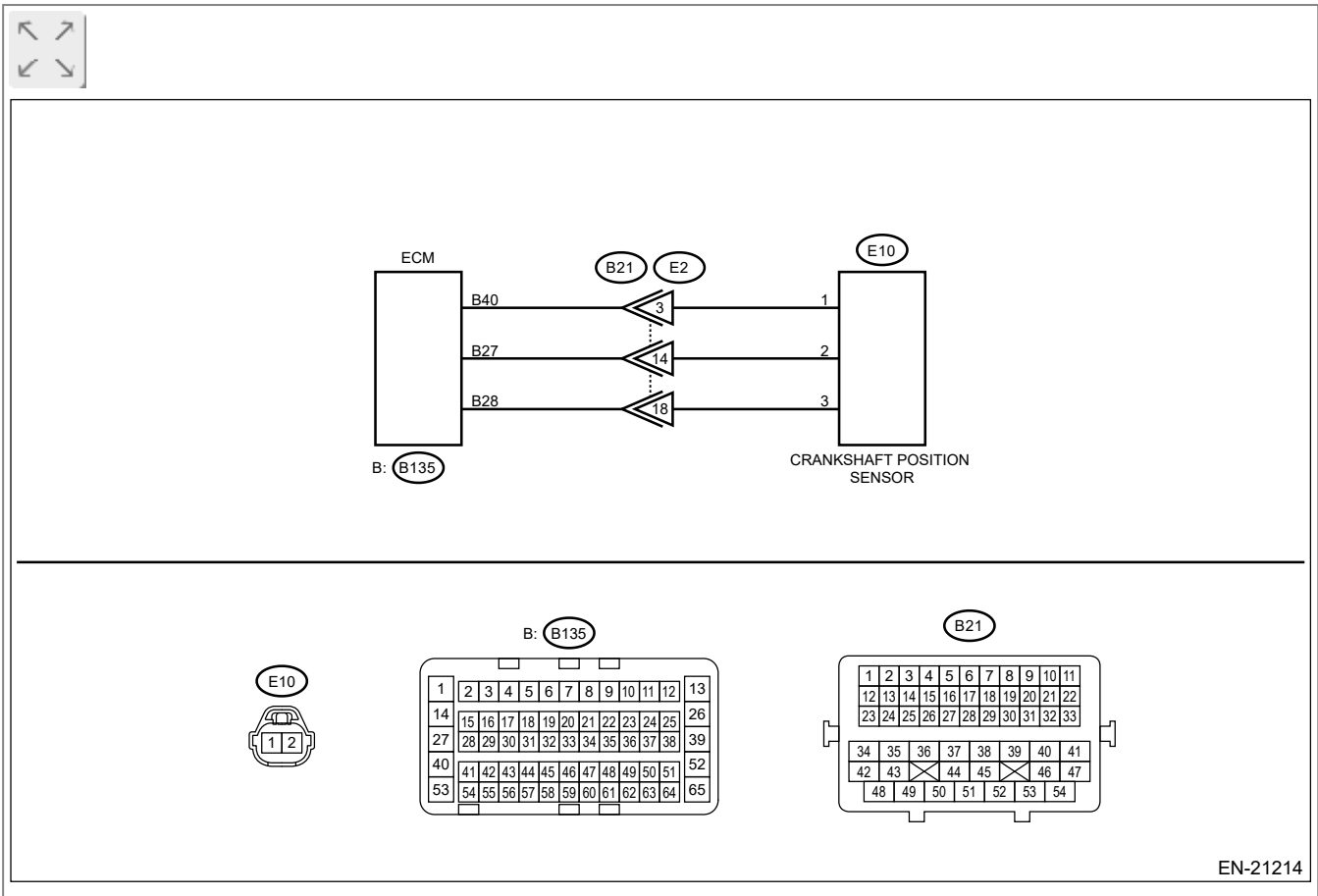
- Engine stalls.
- Failure of engine to start

Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



EN-21214


1. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.




Is the crankshaft position sensor installation bolt tightened securely?



Yes

 [Go to 2.](#)

No

Tighten the crankshaft position sensor installation bolt securely.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Crankshaft Position Sensor>INSTALLATION.](#)

2. CHECK CRANKSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Remove the crankshaft position sensor.
3. Measure the resistance between terminals of crankshaft position sensor.

Terminals

No. 1 —No. 2:

Is the resistance between 1 and 4 k Ω ?

Yes

 [Go to 3.](#)

No

Replace the crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Crankshaft Position Sensor.](#)

3. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and crankshaft position sensor connector.

Connector & terminal

(B135) No. 40 — (E10) No. 1:

(B135) No. 27 — (E10) No. 2:

Is the resistance less than 1 Ω ?

Yes

Repair the poor contact of ECM and crankshaft position sensor connector.

No

repair the harness and connector.

Note:

In this case, repair the following item:

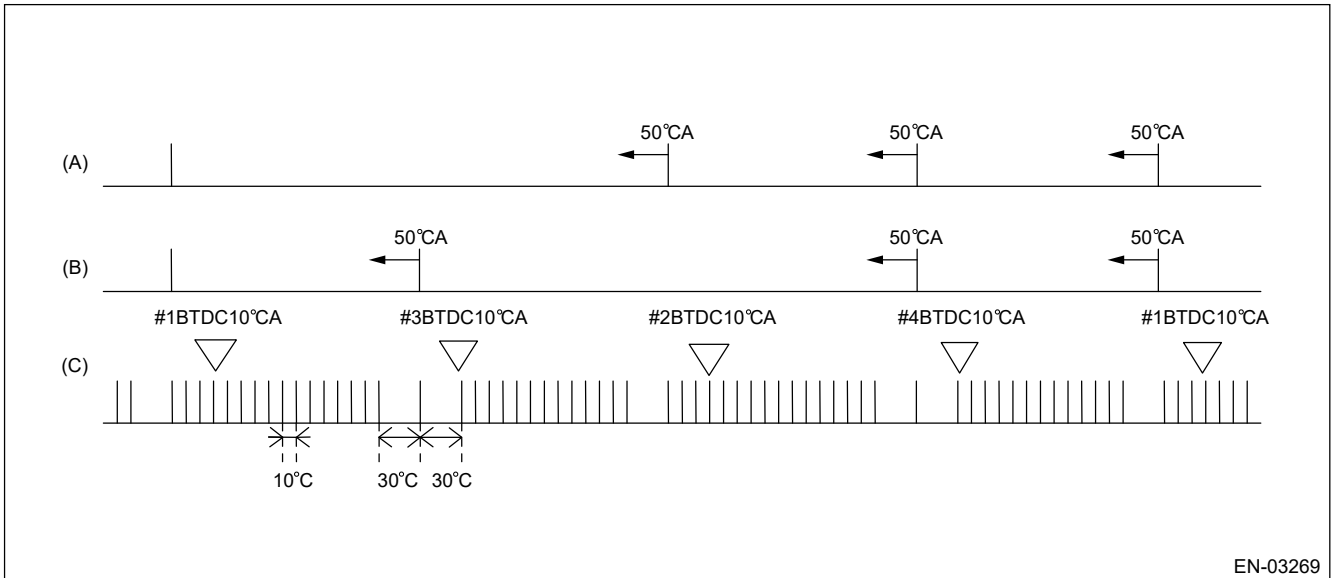
- **Open circuit in harness between ECM connector and crankshaft position sensor connector**
- **Poor contact of coupling connector**

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the crankshaft position sensor.

Judge as NG when the crank signal is not input even though the starter was rotated.

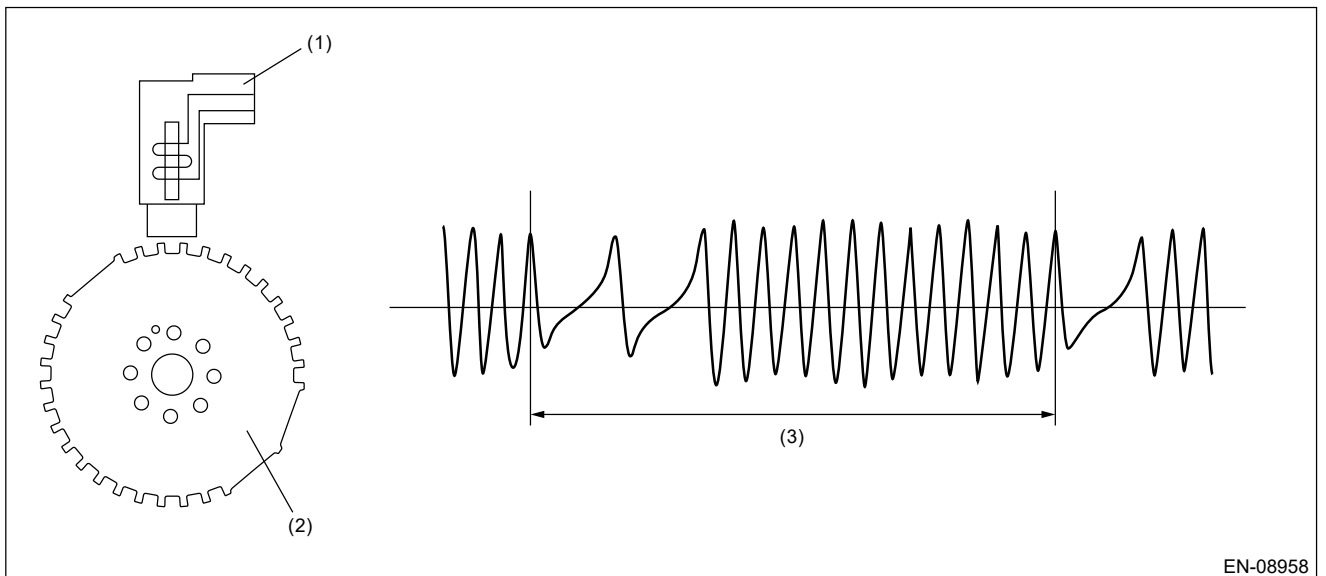
2. COMPONENT DESCRIPTION



(A) Camshaft signal (RH)

(B) Camshaft signal (LH)

(C) Crankshaft signal



(1) Crankshaft position sensor

(2) Crankshaft position sensor plate

(3) Crankshaft half-turn plate

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 8V

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Number of crankshaft position sensor signals during cranking	= 0

Time needed for diagnosis: 3000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0336 CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Engine stalls.
- Failure of engine to start

Caution:


After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE.

1. CHECK CONDITION OF CRANKSHAFT POSITION SENSOR.


Turn the ignition switch to OFF.

Is the crankshaft position sensor installation bolt tightened securely?

Yes

 [Go to 2.](#)


No

Tighten the crankshaft position sensor installation bolt securely.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Crankshaft Position Sensor>INSTALLATION.](#)

2. CHECK CRANKSHAFT POSITION SENSOR PLATE.

Is there crack or damage in the crankshaft position sensor plate teeth?

Yes

Replace the crankshaft position sensor plate.  [Ref. to MECHANICAL\(H4DO\)>Cylinder Block.](#)

No

 [Go to 3.](#)


3. CHECK INSTALLATION CONDITION OF TIMING CHAIN.

Turn the crankshaft, and align alignment mark on crank sprocket with alignment mark on cylinder block.


ST 18252AA000 CRANKSHAFT SOCKET

Is the timing chain dislocated from its proper position?

Yes

Correct the installation condition of timing chain.  [Ref. to MECHANICAL\(H4DO\)>Timing Chain Assembly.](#)

No

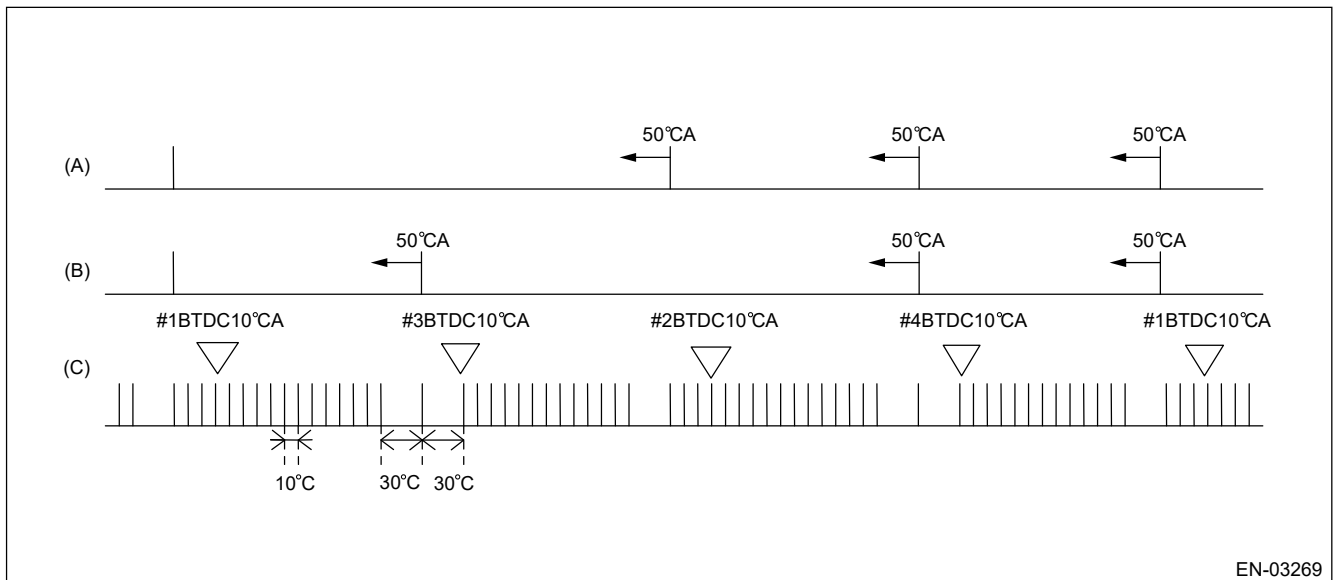
Replace the crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Crankshaft Position Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect for faults in crankshaft position sensor output properties.

Judge as NG when there is a problem in the number of crankshaft signals for every revolution of crankshaft.

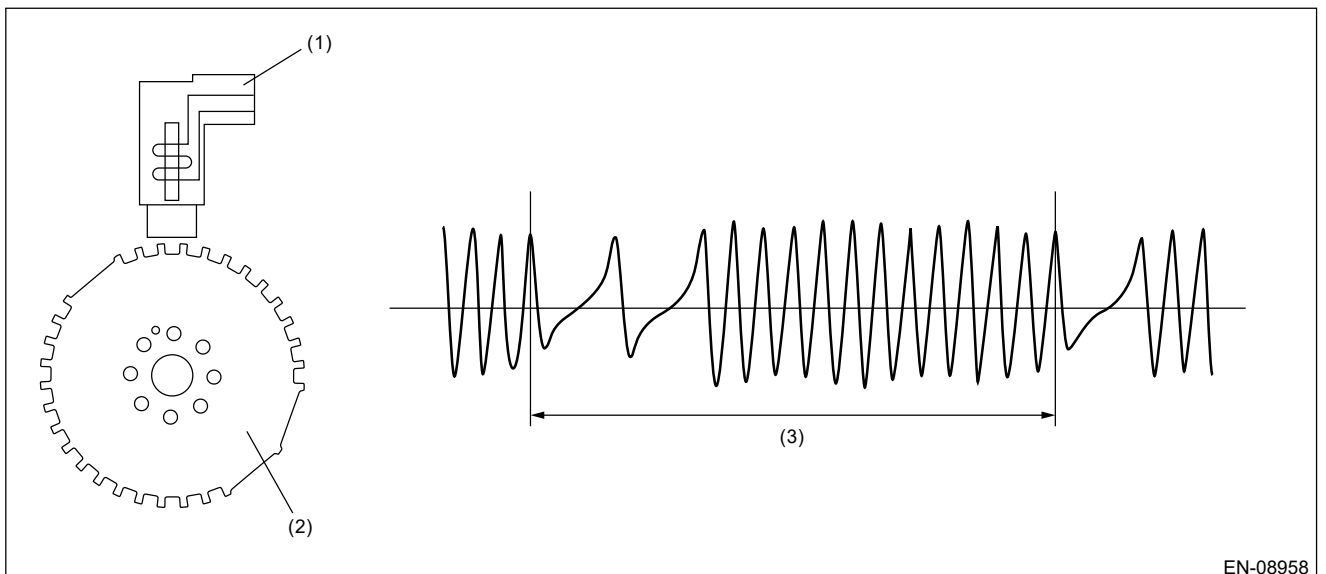
2. COMPONENT DESCRIPTION



(A) Camshaft signal (RH)

(B) Camshaft signal (LH)

(C) Crankshaft signal



(1) Crankshaft position sensor

(2) Crankshaft position sensor
plate

(3) Crankshaft half-turn

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 8V$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Amount of crank sensor signal during 1 rev of crankshaft	$\neq 30$

Time Needed for Diagnosis: 10engine revs.

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 1 OR SINGLE SENSOR



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Engine stalls.
- Failure of engine to start

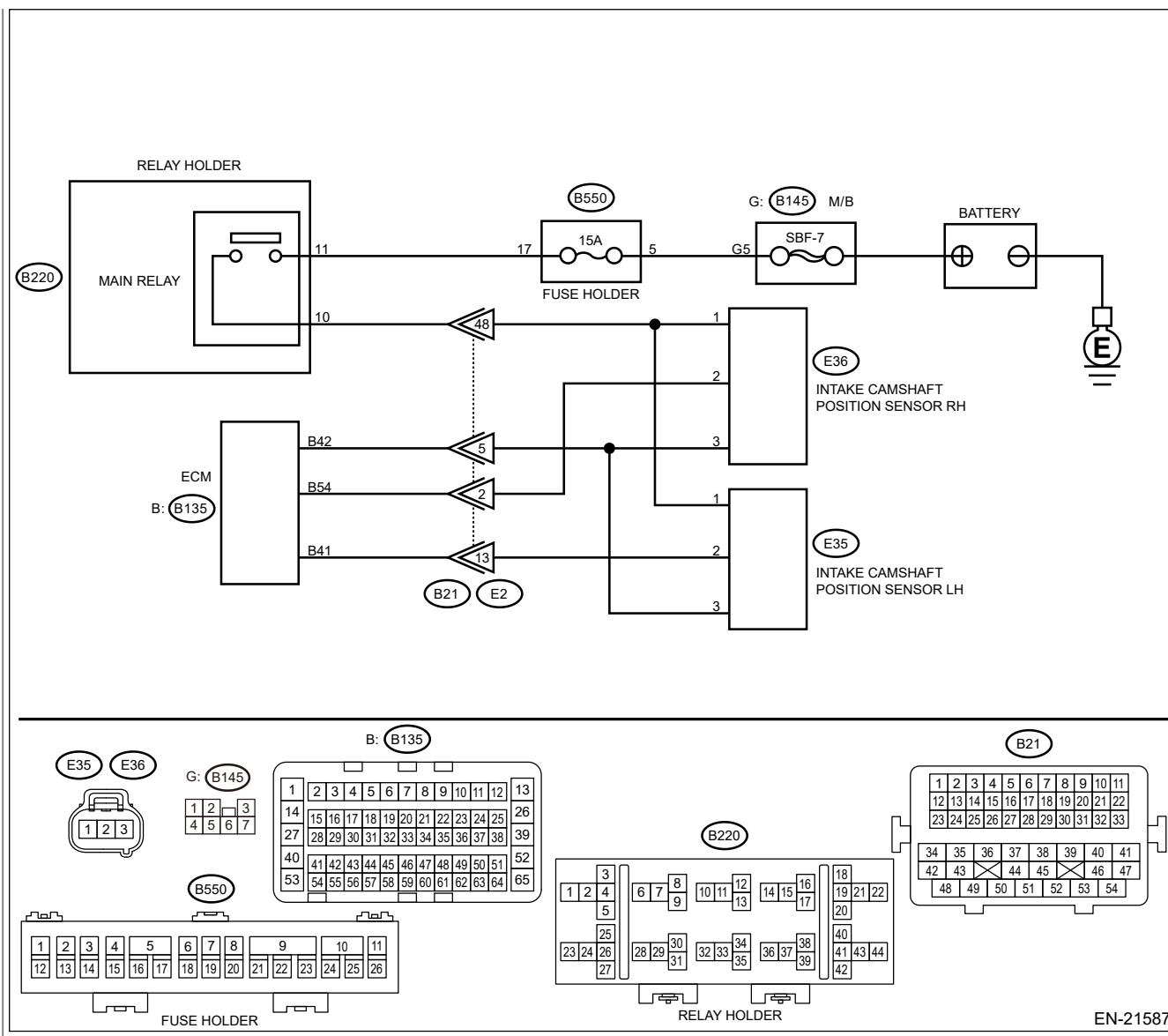
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21587

1. CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from camshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between camshaft position sensor connector and engine ground.

Connector & terminal

(E36) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

[Go to 2.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit or short circuit to ground in harness between main relay connector and camshaft position sensor connector**
- **Poor contact of coupling connector**

2. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and camshaft position sensor connector.


Connector & terminal

(B135) No. 54 — (E36) No. 2:

(B135) No. 42 — (E36) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and camshaft position sensor connector**
- **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.

Measure the resistance between camshaft position sensor connector and engine ground.

Connector & terminal

(E36) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair short circuit to ground in harness between ECM connector and camshaft position sensor connector.

4. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.

Measure the voltage between camshaft position sensor connector and engine ground.

Connector & terminal


(E36) No. 2 (+) — Engine ground (–):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in the harness between ECM connector and camshaft position sensor connector.

No

 [Go to 5.](#)


5. CHECK CONDITION OF CAMSHAFT POSITION SENSOR.

Is the camshaft position sensor installation bolt tightened securely?


Yes

 [Go to 6.](#)

No

Tighten the camshaft position sensor installation bolt securely.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Camshaft Position Sensor>INSTALLATION.](#)

6. CHECK CAMSHAFT POSITION SENSOR.

Check the waveform of the camshaft position sensor.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Engine Control Module \(ECM\) I/O Signal.](#)

Is there any abnormality in waveform?

Yes

Replace the camshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Camshaft Position Sensor.](#)

No

Repair the following item.

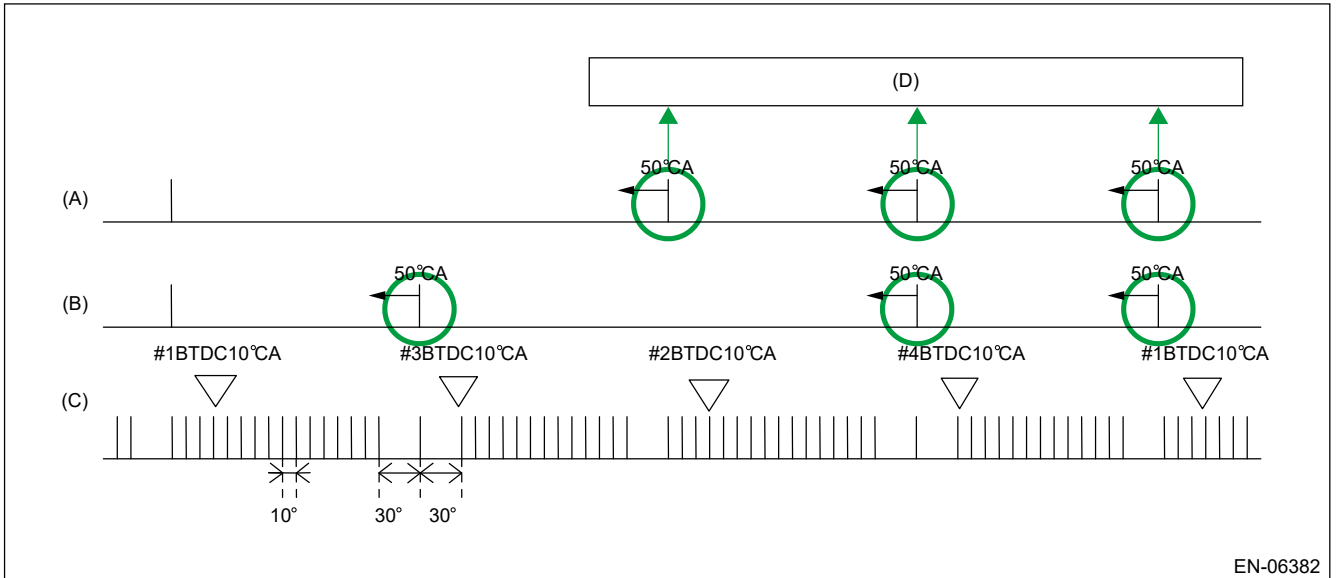
- Poor contact of ECM connector
- Poor contact of camshaft position sensor connector
- Poor contact of coupling connector

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the camshaft position sensor.

When there is no camshaft position signal input continuously, judge as NG.

2. COMPONENT DESCRIPTION



- (A) Camshaft signal (RH)
- (B) Camshaft signal (LH)
- (C) Crankshaft signal
- (D) Camshaft position signal:
When normal, there will be 3 camshaft position signals for every 2 crankshaft revolutions.

3. EXECUTION CONDITION

Diagnosis 1

Secondary Parameters	Execution condition
Battery voltage	≥ 8V

Diagnosis 2

Secondary Parameters	Execution condition
Battery voltage	≥ 8V
Elapsed time after starting the engine	≥ 200ms

4. GENERAL DRIVING CYCLE

Diagnosis 1: Perform the diagnosis only once.

Diagnosis 2: Perform the diagnosis continuously after 200 ms have passed since the engine started.

5. DIAGNOSTIC METHOD

Diagnosis 1

Judge as NG when no input of camshaft position sensor signal during cranking remains for 10 time(s).

Judgment value

Malfunction Criteria	Threshold Value

Number of camshaft position sensor signals during cranking	= 0
--	-----

Time needed for diagnosis: 3000ms

Diagnosis 2

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Amount of camshaft position sensor signals during 0.5 revs of crankshaft	= 0


Time needed for diagnosis: 6 engine revs.

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0341 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 1 OR SINGLE SENSOR

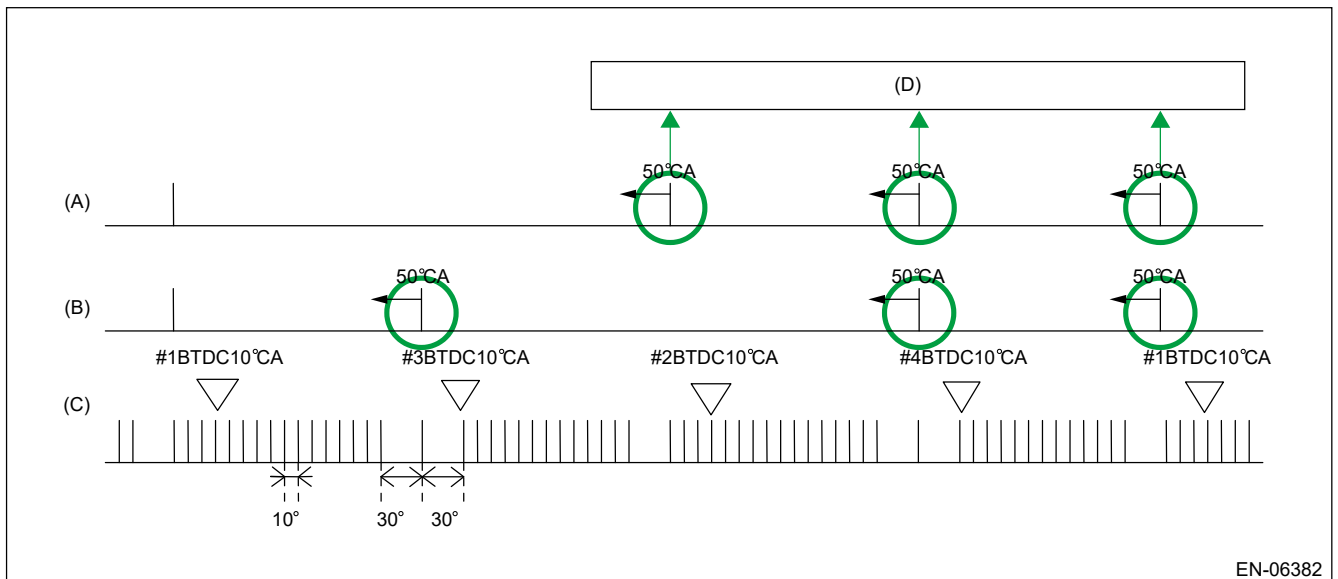
Note:

For the diagnostic procedure, refer to DTC P0340.  Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 1 OR SINGLE SENSOR.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of camshaft position sensor property.
Judge as NG when the number of camshaft signals remains abnormal.

2. COMPONENT DESCRIPTION



EN-06382

- (A) Camshaft signal (RH)
- (B) Camshaft signal (LH)
- (C) Crankshaft signal
- (D) Camshaft position signal:
When normal, there will be 3 camshaft position signals for every 2 crankshaft revolutions.

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 8V
Elapsed time after starting the engine	≥ 200ms

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the condition continues where the number of camshaft position sensor signals are not 2 times during 3 revs of crankshaft.

Judgment value

Malfunction Criteria	Threshold Value
Amount of camshaft sensor signal during 2 revs of crankshaft	≠ 3time(s)

Time needed for diagnosis: 8 engine revs.

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0345 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 2


DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Engine stalls.
- Failure of engine to start

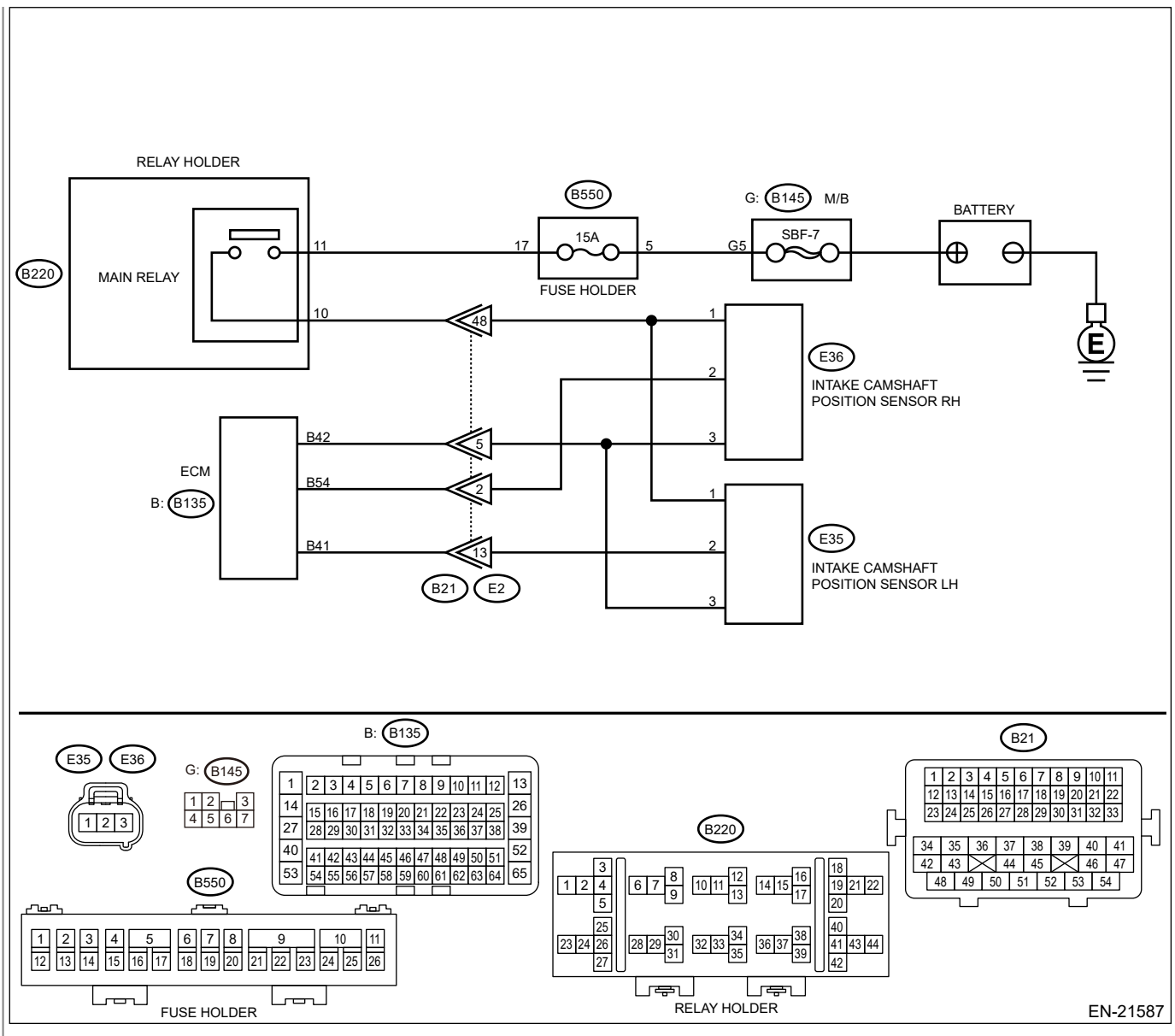
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode. and Inspection Mode !\[\]\(64ef2b19d70b31fbbfce0e0e2aa3d7b4_img.jpg\) \[Ref. to ENGINE \\(DIAGNOSTICS\\)\\(H4DO\\)>Inspection Mode.\]\(#\)](#)**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





EN-21587

1. CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from camshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between camshaft position sensor connector and engine ground.


Connector & terminal

(E35) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 Go to 2.

 repair the harness and connector.

No

Note:

In this case, repair the following item:

- **Open circuit or short circuit to ground in harness between main relay connector and camshaft position sensor connector**
- **Poor contact of coupling connector**

2. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and camshaft position sensor connector.


Connector & terminal

(B135) No. 41 — (E35) No. 2:

(B135) No. 42 — (E35) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and camshaft position sensor connector**
- **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.

Measure the resistance between camshaft position sensor connector and engine ground.

Connector & terminal

(E35) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair short circuit to ground in harness between ECM connector and camshaft position sensor connector.

4. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.

Measure the voltage between camshaft position sensor connector and engine ground.

Connector & terminal

(E35) No. 2 (+) — Engine ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in the harness between ECM connector and camshaft position sensor connector.


No

 [Go to 5.](#)


5. CHECK CONDITION OF CAMSHAFT POSITION SENSOR.

Is the camshaft position sensor installation bolt tightened securely?


Yes

 [Go to 6.](#)

No

Tighten the camshaft position sensor installation bolt securely.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Camshaft Position Sensor>INSTALLATION.](#)

6. CHECK CAMSHAFT POSITION SENSOR.

Check the waveform of the camshaft position sensor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Engine Control Module \(ECM\) I/O Signal.](#)

Is there any abnormality in waveform?

Yes

Replace the camshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Camshaft Position Sensor.](#)


No

Repair the following item.

- Poor contact of ECM connector
- Poor contact of camshaft position sensor connector
- Poor contact of coupling connector

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to DTC P0340.  **Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 1 OR SINGLE SENSOR.**

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P0346 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 2

Note:

For the diagnostic procedure, refer to DTC P0345.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0345 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 2.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0341.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0341 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 1 OR SINGLE SENSOR.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN


DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

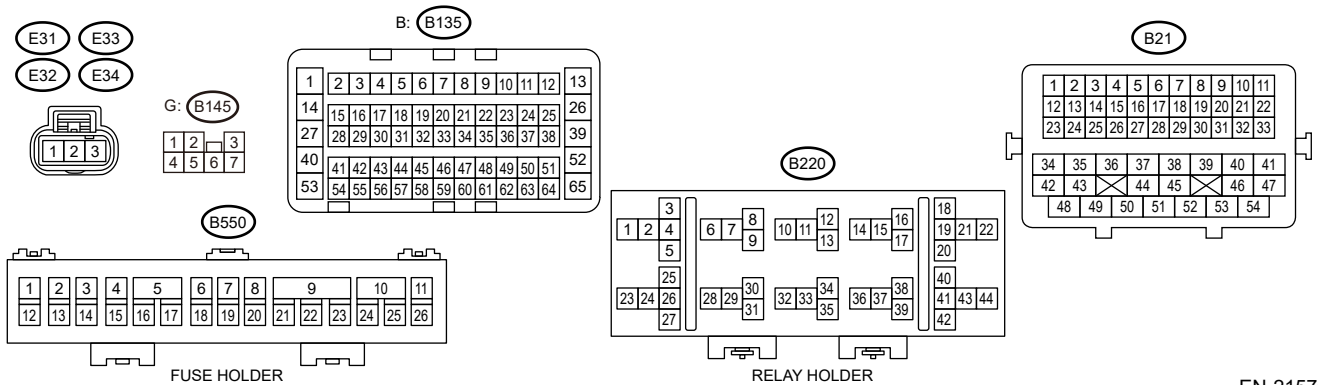
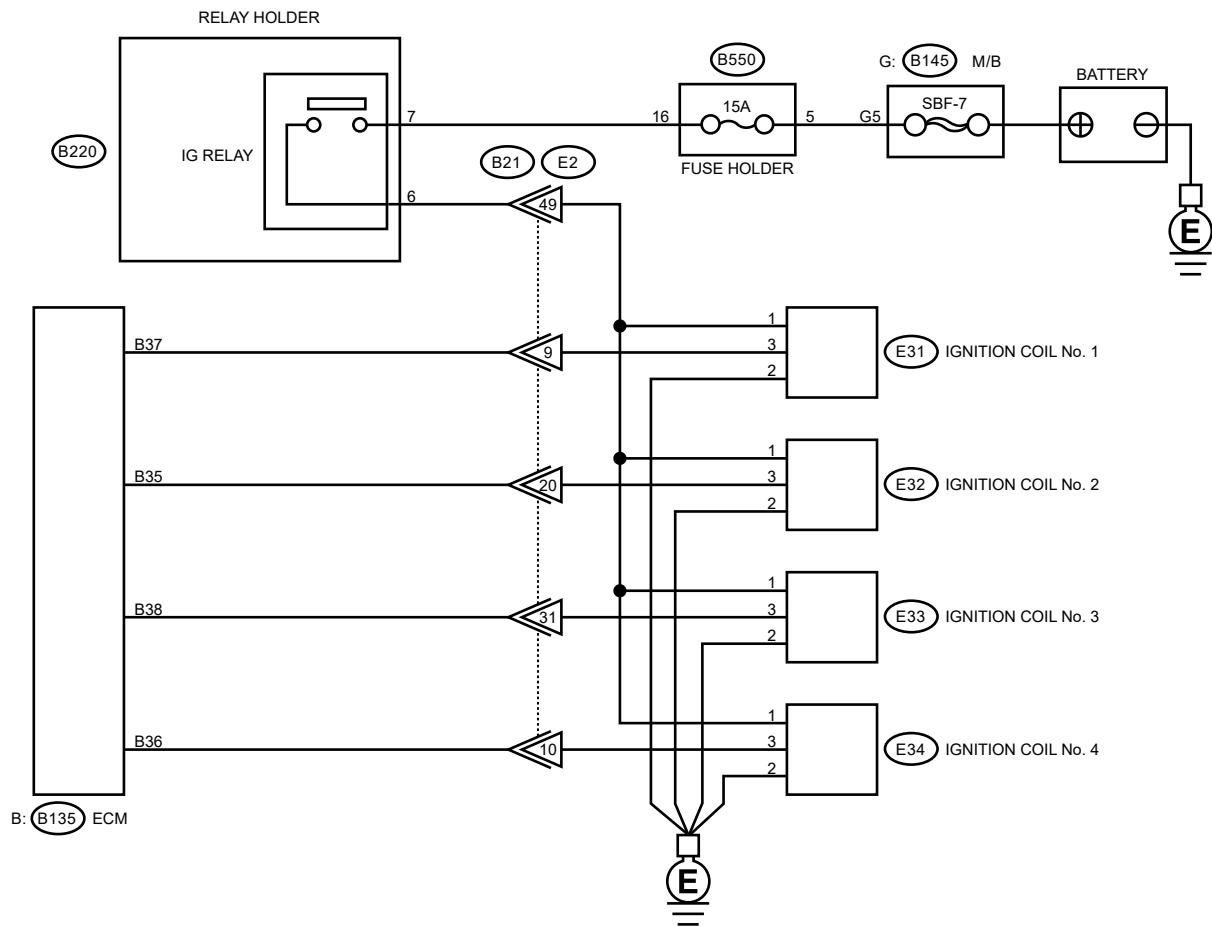
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode. and Inspection Mode !\[\]\(b3cfbfd04368a71f4c64e073908d25d7_img.jpg\) \[Ref. to ENGINE \\(DIAGNOSTICS\\)\\(H4DO\\)>Inspection Mode.\]\(#\)](#)**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





EN-21576

1. CHECK IGNITION COIL POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ignition coil.
3. Turn the ignition switch to ON.
4. Measure the voltage between ignition coil connector and engine ground.

Connector & terminal

DTC P0351; (E31) No. 1 (+) — Engine ground (-):


DTC P0352; (E32) No. 1 (+) — Engine ground (-):

DTC P0353; (E33) No. 1 (+) — Engine ground (-):

DTC P0354; (E34) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open or short to ground in harness of power supply circuit**
- **Blown out of fuse**
- **Poor contact of IG relay connector**
- **Poor contact of coupling connector**
- **Faulty IG relay**

2. CHECK HARNESS OF IGNITION COIL GROUND CIRCUIT.

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between ignition coil connector and engine ground.

Connector & terminal

DTC P0351; (E31) No. 2 — Engine ground:

DTC P0352; (E32) No. 2 — Engine ground:

DTC P0353; (E33) No. 2 — Engine ground:

DTC P0354; (E34) No. 2 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit in harness between ignition coil connector and engine grounding terminal.

3. CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance between ignition coil connector and engine ground.

Connector & terminal

DTC P0351; (E31) No. 3 — Engine ground:


DTC P0352; (E32) No. 3 — Engine ground:

DTC P0353; (E33) No. 3 — Engine ground:

DTC P0354; (E34) No. 3 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair the ground short circuit of harness between ECM connector and ignition coil connector.

4. CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR.



Measure the resistance of harness between ECM connector and ignition coil connector.

Connector & terminal

DTC P0351; (B135) No. 37 — (E31) No. 3:

DTC P0352; (B135) No. 35 — (E32) No. 3:

DTC P0353; (B135) No. 38 — (E33) No. 3:

DTC P0354; (B135) No. 36 — (E34) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 5.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and the ignition coil connector**
- **Poor contact of coupling connector**

5. CHECK FOR POOR CONTACT.



Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes

Repair the poor contact of ECM connector.

No

 [Go to 6.](#)

6. CHECK SPARK PLUG CONDITION.



1. Remove the spark plug of the corresponding cylinder. [Ref. to IGNITION\(H4DO\)>Spark Plug>REMOVAL.](#)
2. Check the spark plug condition. [Ref. to IGNITION\(H4DO\)>Spark Plug>INSPECTION.](#)

Is the spark plug condition normal?

Yes

Replace the ignition coil. [Ref. to IGNITION\(H4DO\)>Ignition Coil.](#)

No

Replace the spark plug. [Ref. to IGNITION\(H4DO\)>Spark Plug.](#)

1. OUTLINE OF DIAGNOSIS

Based on the self-diagnostic result of the ignition coil driving IC, judge the ignition coil driving circuit as normal or abnormal.

The ignition coil driving IC detects "no ignition" status as a malfunction.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Elapsed time after starting the engine	> 1 s
Engine speed	≥ 500 rpm

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Ignition driving IC information	Trouble


Time needed for diagnosis: 2560 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P0352 IGNITION COIL "B" PRIMARY CONTROL CIRCUIT/OPEN

Note:

For the diagnostic procedure, refer to DTC P0351.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN.](#)

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to DTC P0351.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P0353 IGNITION COIL "C" PRIMARY CONTROL CIRCUIT/OPEN

Note:

For the diagnostic procedure, refer to DTC P0351.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN.](#)

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to DTC P0351.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P0354 IGNITION COIL "D" PRIMARY CONTROL CIRCUIT/OPEN

Note:

For the diagnostic procedure, refer to DTC P0351.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0351.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0400 EGR "A" FLOW


DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Movement performance problem when engine is low speed.
- Improper idling
- Movement performance problem

Caution:


After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE..

1. CHECK DATA MONITOR.



1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Mani. Absolute Pressure].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Subaru Select Monitor.
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Mani. Absolute Pressure] 53.3 kPa (400 mmHg, 15.75 inHg) or more?

Yes

Make sure that the EGR control valve, manifold absolute pressure sensor and throttle body are installed securely.

No

 [Go to 2.](#)

2. CHECK EGR CONTROL VALVE.




Remove the EGR control valve.

Are there any holes, clogged lines or foreign matters in the EGR system?

Yes

Repair the EGR system.

No

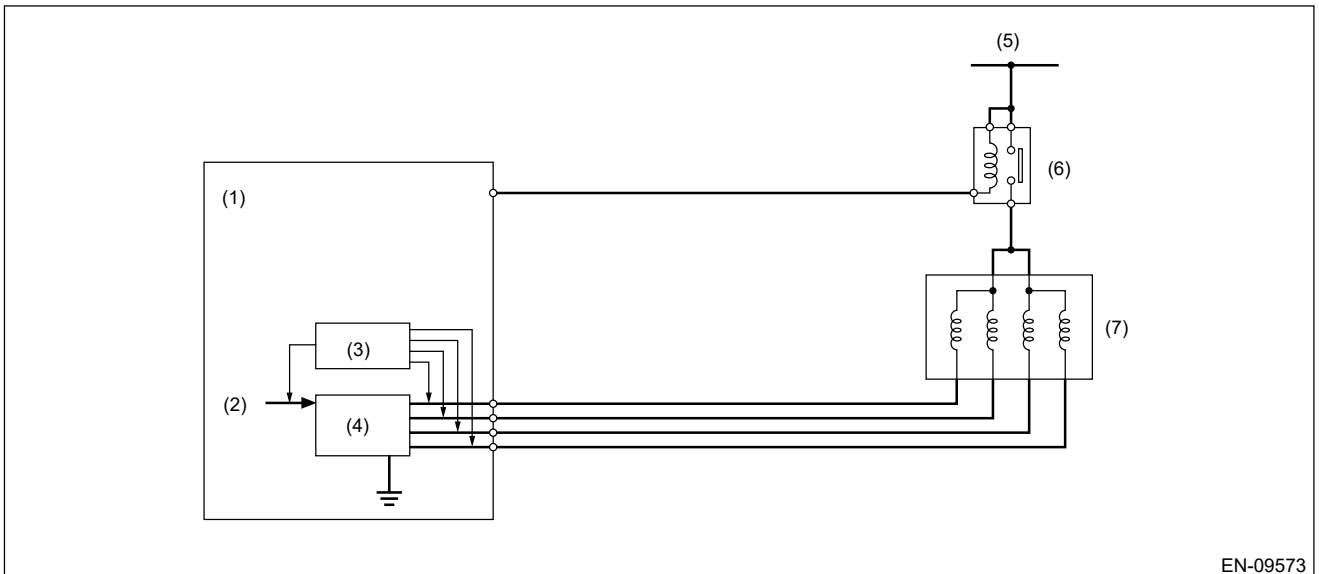
Replace EGR control valve.  Ref. to EMISSION CONTROL (AUX. EMISSION

1. OUTLINE OF DIAGNOSIS

Detect EGR system malfunction.

Intake manifold pressure (negative pressure) is constant because the throttle valve is fully closed during deceleration fuel cut. At this time, when the EGR control valve is opened/closed, the intake manifold pressure will change. EGR System OK/NG is judged by the range of this change.

2. COMPONENT DESCRIPTION



EN-09573

- (1) Engine control module (ECM) (4) Switching circuit (6) Main relay
 (2) Computer unit (CPU) (5) Battery voltage (7) EGR control valve
 (3) Detecting circuit

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Barometric pressure	≥ 75.1kPa (563mmHg, 22.2inHg)
Intake air temperature	≥ 0°C (32°F)
Engine speed	≥ 1300rpm (CVT model) ≥ 1400rpm (MT model)
Vehicle speed	≥ 40km/h (24.9MPH)
Deceleration fuel cut for 3000 ms or more	Experienced
Neutral switch	OFF

4. GENERAL DRIVING CYCLE

During deceleration fuel cut from 40 km/h (24.9 MPH) or more, perform diagnosis only once.

Be careful of vehicle speed and engine speed. (Diagnosis will not be completed if the vehicle speed and engine speed conditions become out of specification due to deceleration.)

5. DIAGNOSTIC METHOD

Measure the pressure values when the enable conditions are established, and perform diagnosis by calculating those results.

1. Label the intake manifold pressure value as PMOF1, which is observed when the enable conditions are established, and set the EGR target step to 52step(s) (nearly full open).
2. Label the intake manifold pressure value as PMON, which is observed after 1000ms has passed since EGR target step was set to 52step(s) (when the enable conditions were established), and set the EGR target step to 0.
3. Label the intake manifold pressure as PMOF2, which is observed after 1000ms has passed since EGR target step was set to 0 (after (1000ms + 1000ms) have passed since the enable conditions were established).

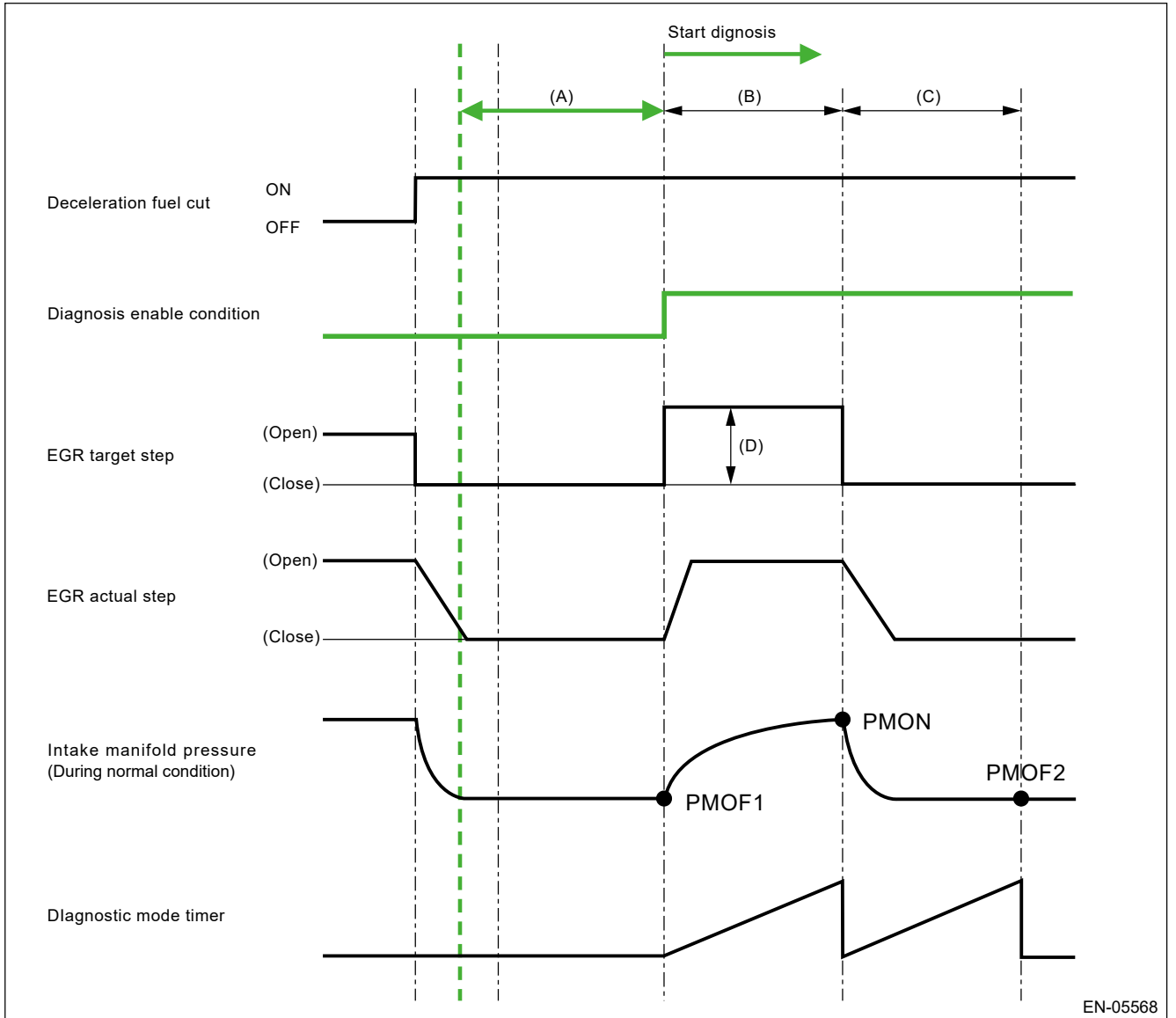
Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
$PMON - (PMOF1 + PMOF2)/2$	< 2.5kPa (18.63mmHg, 0.7inHg)

Time needed for diagnosis: 1000ms× 2 time(s)

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



EN-05568

(A) 3000ms
(D) 52step(s)

(B) 1000ms

(C) 1000ms

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0420 CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD BANK 1



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Engine stalls.
- Idle mixture is out of specifications.

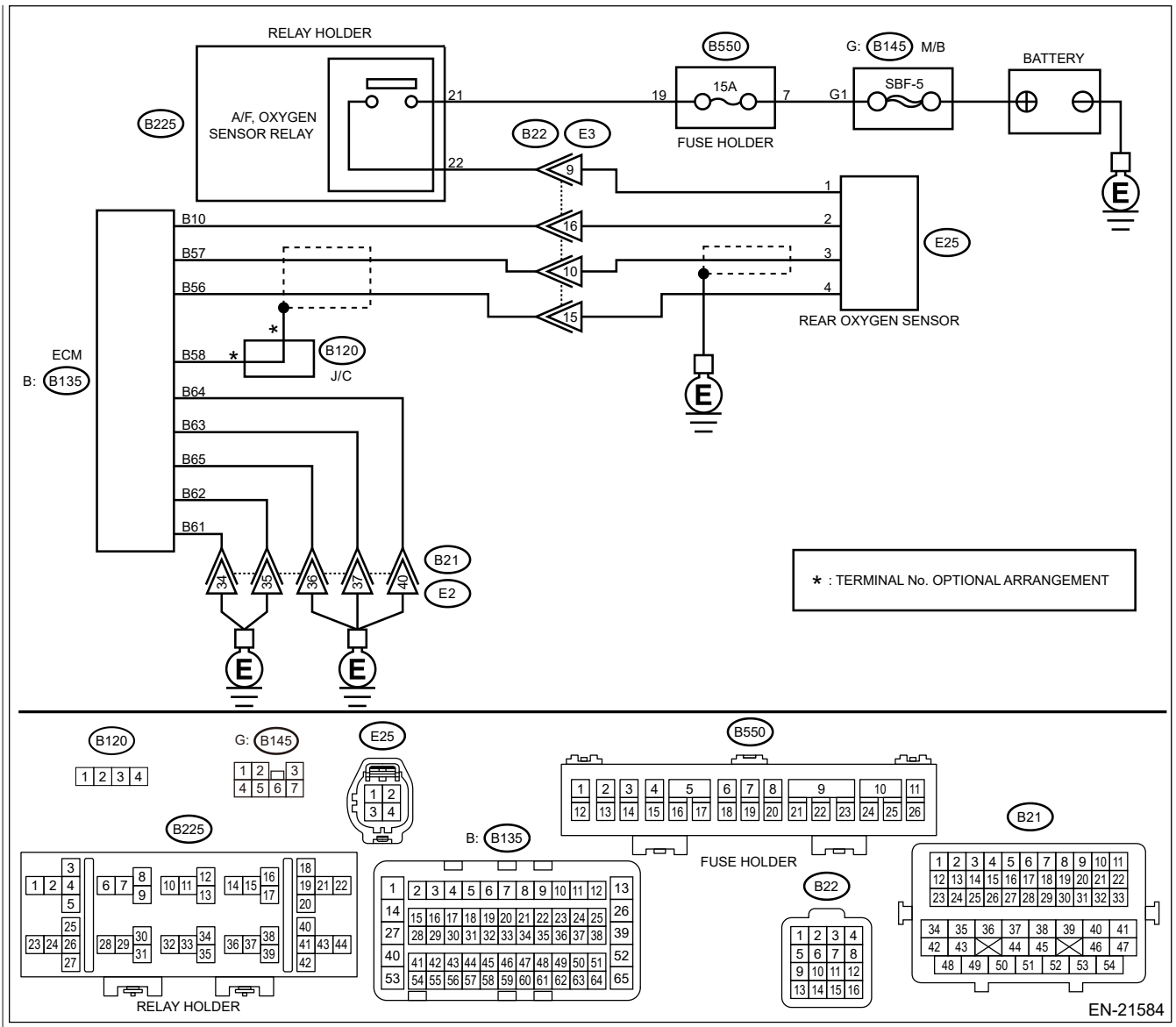
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21584

1. CHECK EXHAUST SYSTEM.

Check for gas leaks or air suction caused by loose or dislocated nuts and bolts, and open hole at exhaust pipes.

Note:

Check the following positions.

- Between cylinder head and front exhaust pipe
- Between front exhaust pipe and front catalytic converter
- Between front catalytic converter and rear catalytic converter
- Loose or improperly attached front oxygen (A/F) sensor or rear oxygen sensor

Is there any fault in exhaust system?

Yes

Repair or replace the exhaust system. [Ref. to EXHAUST\(H4DO\)>General](#)

[Description.](#)

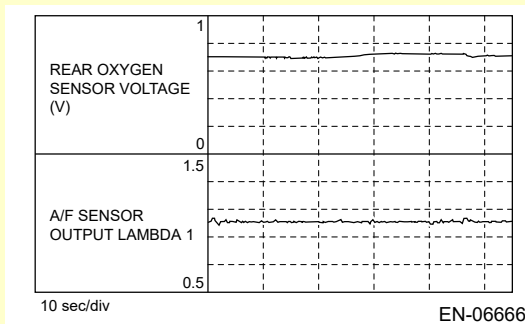
No

 [Go to 2.](#)

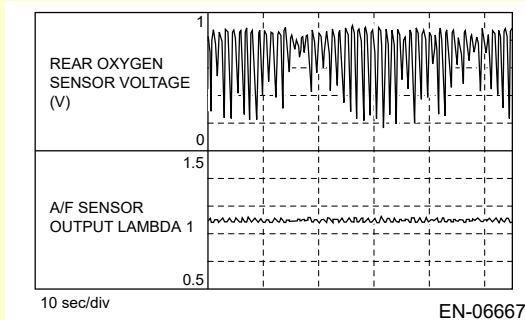
2. CHECK WAVEFORM DATA ON THE SUBARU SELECT MONITOR (WHILE DRIVING).



1. Drive at a constant speed between 80 — 112 km/h (50 — 70 MPH).
2. After 5 minutes have elapsed in the condition of step 1), use the Subaru Select Monitor while still driving to read the waveform data.
 - At normal condition



- At abnormal condition (numerous inversion)



Is a normal waveform displayed?

Yes

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

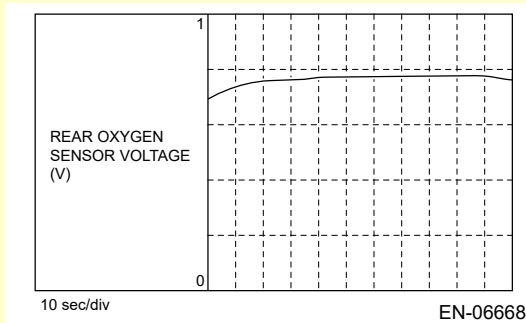
No

 [Go to 3.](#)

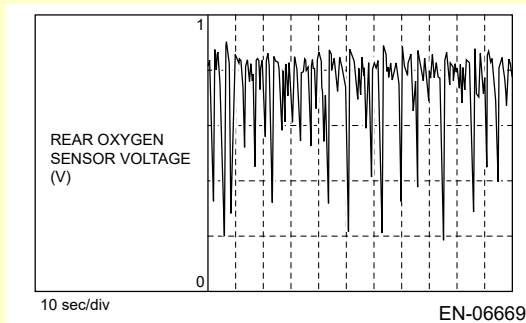
3. CHECK WAVEFORM DATA ON THE SUBARU SELECT MONITOR (WHILE IDLING).



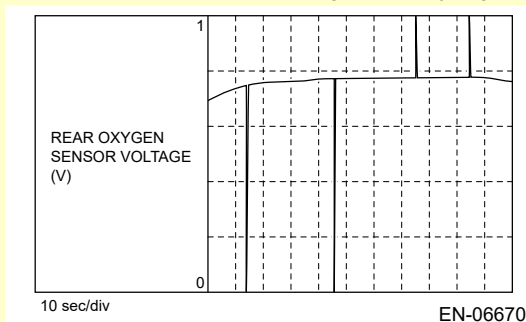
1. Run the engine at idle.
2. In the condition of step 1), use the Subaru Select Monitor to read the waveform data.
 - At normal condition



- At abnormal condition 1 (numerous inversion)



- At abnormal condition 2 (noise input)



Is a normal waveform displayed?

Yes

[Go to 4.](#)

No

- The waveform is displayed at abnormal condition 1: [Go to 4.](#)
- The waveform is displayed at abnormal condition 2: [Go to 5.](#)

4. CHECK CATALYTIC CONVERTER.




Is the catalytic converter damaged?

Yes

Replace the catalytic converter. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Front Catalytic Converter.](#) [Ref. to](#)

[EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Rear Catalytic Converter.](#)

No

 [Go to 5.](#)


5. CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.

Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 6.](#)

6. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from rear oxygen sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.

Connector & terminal

(B135) No. 57 — (E25) No. 3:

(B135) No. 56 — (E25) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 7.](#)

No

repair the harness and connector.

Note:

Repair the following locations.

- Open circuit in harness between ECM connector and rear oxygen sensor connector
- Poor contact of coupling connector

7. CHECK REAR OXYGEN SENSOR SHIELD.

1. Turn the ignition switch to OFF.
2. Expose the rear oxygen sensor connector body side harness sensor shield.

3. Measure the resistance between sensor shield and chassis ground.

Is the resistance less than 1 Ω?

Yes

[Go to 8.](#)

No

Repair the open circuit of rear oxygen sensor harness.

8. CHECK ENGINE OIL AMOUNT AND EXHAUST GAS.

1. Check the engine oil amount. [Ref. to LUBRICATION\(H4DO\)>Engine Oil>INSPECTION.](#)

2. Check exhaust gas during idling.

Does the engine oil amount drop or white smoke emit from the muffler?

Yes

Check the engine, and repair the defective part. [Ref. to MECHANICAL\(H4DO\)>Symptoms and causes>INSPECTION.](#)

After repairing the engine, replace the catalytic converter. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Front Catalytic Converter.](#) [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Rear Catalytic Converter.](#)

After the catalytic converter is replaced, perform step 2 to check the normal waveform is displayed, and then exit the procedure.

No

[Go to 9.](#)

9. CHECK IGNITION SYSTEM.

1. Check the spark plug. [Ref. to IGNITION\(H4DO\)>Spark Plug>INSPECTION.](#)

2. Check the status of the ignition coil connector and the spark plug terminal.

Is there any fault in the ignition system?

Yes

After repairing the ignition system, replace the catalytic converter. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Front Catalytic Converter.](#) [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Rear Catalytic Converter.](#)

After the catalytic converter is replaced, perform step 2 to check the normal waveform is displayed, and then exit the procedure.

No

[Go to 10.](#)

10. CHECK FUEL SYSTEM.



1. Refer to and check the items in "Insufficient fuel supply to fuel injector" (except for "a. Fuel pump does not operate.") and "Leakage or blow out of fuel". [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel System Trouble in General>INSPECTION.](#)
2. Check throttle body. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Throttle Body>INSPECTION.](#)
3. Check intake manifold. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Intake Manifold Assembly>INSPECTION.](#)

Is there any fault in the fuel system?

Yes

After repairing the fuel system, replace the catalytic converter. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Front Catalytic Converter.](#) [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Rear Catalytic Converter.](#)

After the catalytic converter is replaced, perform step 2 to check the normal waveform is displayed, and then exit the procedure.

No

[Go to 11.](#)

11. CHECK DTC.



Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

After checking the DTC, replace the catalytic converter. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Front Catalytic Converter.](#) [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Rear Catalytic Converter.](#)

After the catalytic converter is replaced, perform step 2 to check the normal waveform is displayed, and then exit the procedure.

No

Replace the rear oxygen sensor. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Rear Oxygen Sensor.](#)

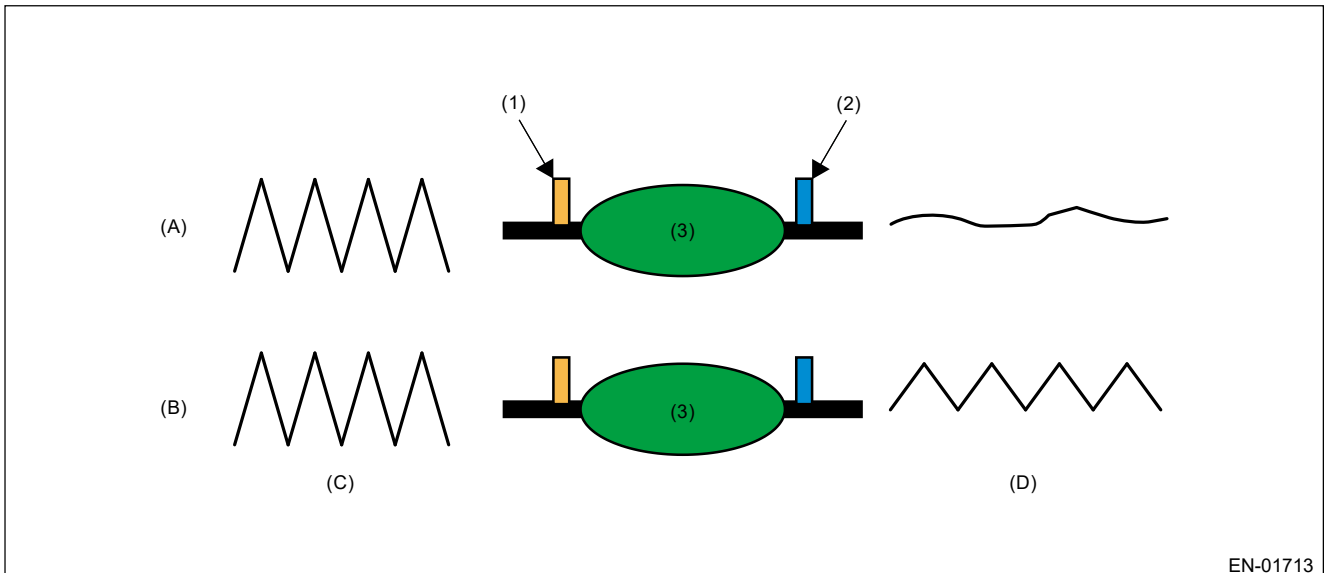
1. OUTLINE OF DIAGNOSIS

Detect the deterioration of the catalyst function.

Though the rear oxygen sensor output changes slowly with a new catalyst, the sensor output with a deteriorated catalyst becomes high and the inversion time is shortened.

For this reason, the catalyst diagnosis is carried out by monitoring the rear oxygen sensor output and comparing it with the front oxygen (A/F) sensor output.

2. COMPONENT DESCRIPTION



(A) Normal

(B) Deterioration

(C) Output waveform from the front oxygen (A/F) sensor

(D) Output waveform from the rear oxygen sensor

(1) Front oxygen (A/F) sensor

(2) Rear oxygen sensor

(3) Catalytic converter

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Barometric pressure	$\geq 75.1 \text{ kPa}$ (563mmHg, 22.2inHg)
Amount of intake air	$< 7.5 \text{ g/s}$ (0.26oz/s)
Accelerator pedal position	$= 0\%$
Rear oxygen output voltage after fuel cut	$< 0.15 \text{ V}$
Estimated catalyst temperature	$\geq 480^\circ \text{C}$ (896°F) (CVT model) $\geq 550^\circ \text{C}$ (1022°F) (MT model)
Estimated temperature of the rear oxygen sensor element	$\geq 500^\circ \text{C}$ (932°F)
((Fuel system status	$= \text{Fuel cut}$
Integrated amount of intake air mass during Fuel cut)	$\geq 12.95 \text{ g}$ (0.46oz)
followed by Fuel system status)	$\neq \text{Fuel cut}$

4. DIAGNOSTIC METHOD

After the enable conditions have been established, calculate the front oxygen (A/F) sensor lambda deviation sum value and the rear oxygen sensor output voltage deviation sum value in every 32 ms × 4 times. If the front oxygen (A/F) sensor lambda deviation sum value is the predetermined value or more, calculate the diagnostic value.

If the duration of time while the following conditions are met is within the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Catalyst monitor value - Rear oxygen sensor response compensation coefficient	< 0.35g (0.01oz)

Catalyst monitor value* = | (Σ((Intake air amount/14.7 – Intake air amount/main feedback λ value × 14.7) × 14.7 × 0.23)TF)|

* Catalyst monitor value will be calculated until the rear oxygen sensor exceeds 0.2 V after returning from fuel cut of 5 to 15 seconds.

Map TF = Temperature factor

Map

Estimated catalyst temperature °C (°F)	450 (842)	500 (932)	600 (1112)	650 (1202)	700 (1292)	800 (1472)	900 (1652)	1 0 0 0 (1 8 3 2)
Temperature factor	1.15	1.1	1	1.15	1.2	1.2	1.2	1 . 2

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0441 EVAP SYSTEM (CPC) INCORRECT PURGE FLOW



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

Improper idling


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE.

1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 2.](#)

2. CHECK PURGE CONTROL SOLENOID VALVE.

Operate the purge control solenoid valve using the Subaru Select Monitor.

Note:


For detailed procedures, refer to "Active Test".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Active Test.](#)

Does the purge control solenoid valve operate?

Yes

 [Go to 3.](#)

No

Replace the purge control solenoid valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Purge Control Solenoid Valve.](#)

3. CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE.

Turn the ignition switch to OFF.

Are there holes, cracks, clogging, or disconnection, misconnection of hoses or pipes in evaporative emission control system?

Yes

Repair or replace the hoses or pipes.

No

Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of purge flow by the change of Evaporative Leak Check Module pressure sensor output value before/after purge introduction.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
(Evaporative Leak Check Module switching valve for time)	= Close
Purge control duty ratio	< 120000ms
Preconditions (The condition is to close the intrusive Evaporative Leak Check Module switching valve)	> 0%
Battery voltage value	≥ 10.9 V
Barometric pressure	≥ 75.1kPa (563mmHg, 22.2inHg)
Integrated value of calculated purge airflow since engine start	≥ 72g (2.54oz)*
Barometric pressure – Manifold absolute pressure	≥ 6.7kPa (50mmHg, 2inHg)
((Fuel system status for time) followed by Fuel system status)	= Fuel cut ≥ 1000ms ≠ Fuel cut
Ambient air temperature	≥ -25°C (-13°F)

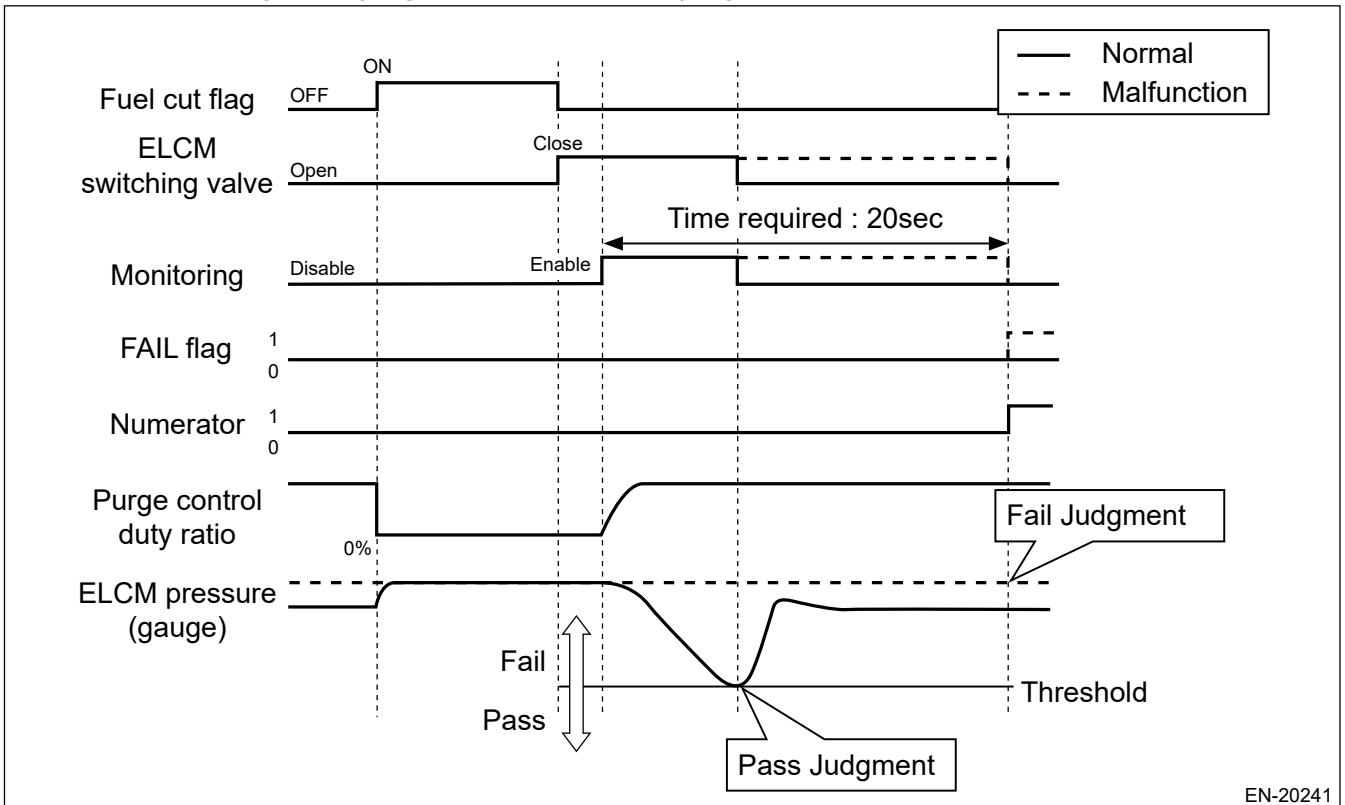
*It takes approximately 2 min at 40 MPH

3. GENERAL DRIVING CYCLE

Perform the diagnosis only once after engine start.

4. DIAGNOSTIC METHOD

If Evaporative Leak Check Module pressure (gauge) does not reach the threshold value within the time needed for diagnosis, judge as malfunction of purge flow.



Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Evaporative Leak Check Module pressure (gauge)	> -0.7kPa (-5mmHg, -0.2inHg)

Time needed for diagnosis: 20 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0451 EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.


Caution:

After servicing or replacing faulty parts, perform **Clear Memory**  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode>OPERATION.](#) and **Inspection Mode**  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode>PROCEDURE.](#)

1. CHECK FOR ANY OTHER DTC ON DISPLAY. 

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)


No

 [Go to 2.](#)

2. CHECK DATA MONITOR. 

1. Turn the ignition switch to ON (engine OFF).
2. Using the Subaru Select Monitor or a general scan tool, read the values of [Barometric Pressure] and [Intake Manifold Absolute Pressure] to compare with actual atmospheric pressure.



Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.
- **To read the actual atmospheric pressure, connect the Subaru Select Monitor or general scan tool to the other known good vehicle.**

Is the difference with the actual atmospheric pressure 2.3 kPa (17.25 mmHg, 0.68 inHg) or more?

Yes

Replace the part that showed larger deviation from the actual atmospheric pressure than the other.

- If deviations in value for [Barometric Pressure] is larger: Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Leak Check Valve Assembly.](#)
- If deviations in value for [Mani. Absolute Pressure] is larger: Replace the manifold absolute pressure sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Manifold Absolute Pressure Sensor.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

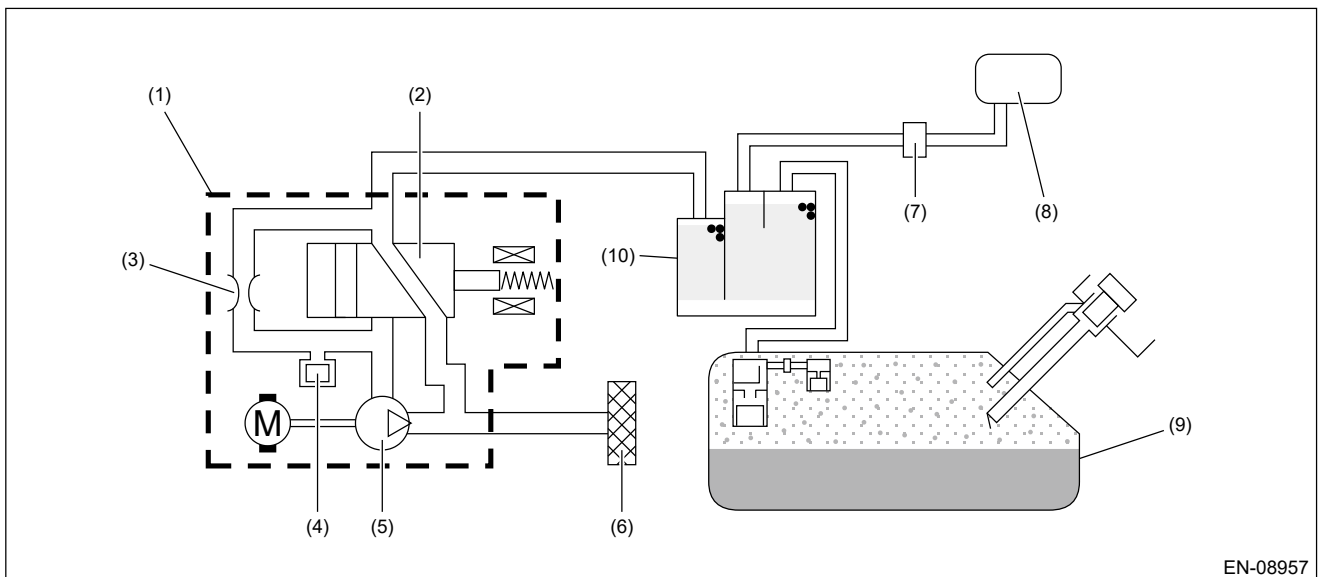
Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

1. OUTLINE OF DIAGNOSIS

Detect the output characteristics malfunction of Evaporative Leak Check Module pressure sensor. Judge as NG when the Evaporative Leak Check Module pressure sensor output value is largely different from the intake manifold pressure when the ignition switch is ON.

2. COMPONENT DESCRIPTION



EN-08957

- | | | |
|---|----------------------------------|---------------|
| (1) Leak check valve ASSY | (5) Vacuum pump | (9) Fuel tank |
| (2) Switching valve | (6) Drain filter | (10) Canister |
| (3) Reference orifice (0.02 inch orifice) | (7) Purge control solenoid valve | |
| (4) Pressure sensor | (8) Intake manifold | |

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Elapsed time after ignition	≥ 500ms

switch to OFF	and
	< 60000ms
Soaking time	≥ 60s
Evaporative Leak Check Module vacuum pump	Not in operation
Evaporative Leak Check Module switching valve	Open
Purge control	Not in operation

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Evaporative Leak Check Module pressure sensor output value – intake manifold pressure (absolute pressure) when ignition switch is ON	> 4732.9Pa (35.5mmHg, 1.4inHg)

Time needed for diagnosis: 320ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0452 EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT LOW

DTC detecting condition:

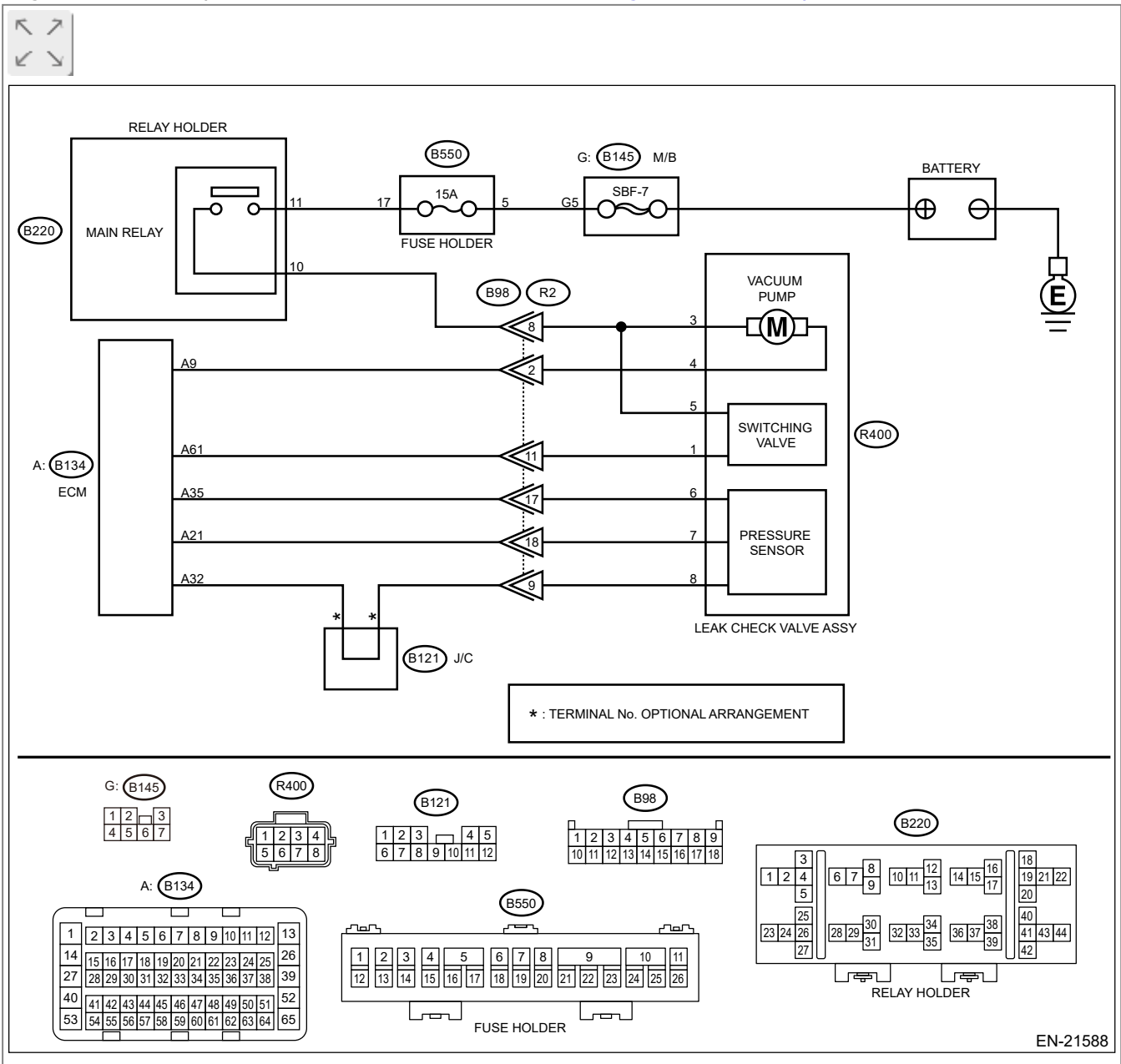
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK CURRENT DATA.



1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Barometric Pressure].

Note:

- **Subaru Select Monitor**
For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value in [Barometric Pressure] 34 kPa (255 mmHg, 10 inHg) or less?

Yes

[Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK POWER SUPPLY OF LEAK CHECK VALVE ASSEMBLY.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the leak check valve assembly.
3. Turn the ignition switch to ON.
4. Measure the voltage between the leak check valve assembly connector and chassis ground.

Connector & terminal

(R400) No. 6 (+) — Chassis ground (-):

Is the voltage 4.5 V or more?

Yes

[Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and the leak check valve assembly connector**
- **Poor contact of ECM connector**

- **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 21 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 4.](#)

No

Repair the short circuit to ground in harness between ECM connector and leak check valve assembly connector.

4. CHECK FOR POOR CONTACT.


Check for poor contact of leak check valve assembly connector.

Is there poor contact in the leak check valve assembly connector?

Yes

Repair the poor contact in the leak check valve assembly connector.

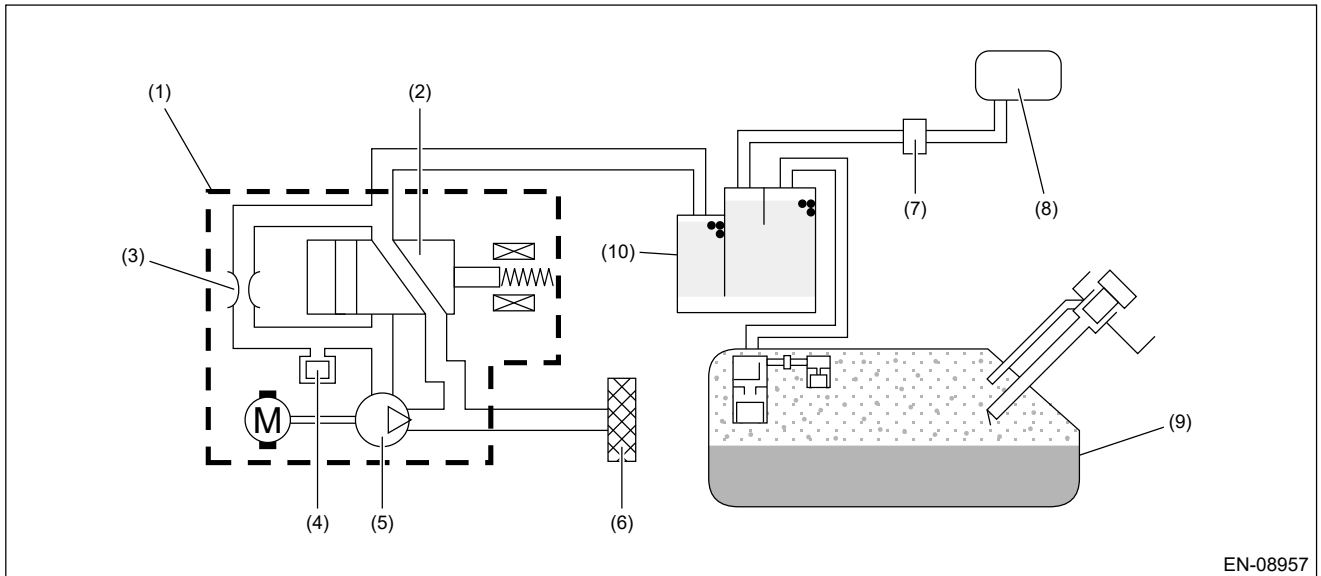
No

Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Leak Check Valve Assembly.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit in Evaporative Leak Check Module pressure sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



- (1) Leak check valve ASSY
- (2) Switching valve
- (3) Reference orifice (0.02 inch orifice)
- (4) Pressure sensor
- (5) Vacuum pump
- (6) Drain filter
- (7) Purge control solenoid valve
- (8) Intake manifold
- (9) Fuel tank
- (10) Canister

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$< 0.973 \text{ V}$

Time needed for diagnosis: 1000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0453 EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT HIGH

DTC detecting condition:

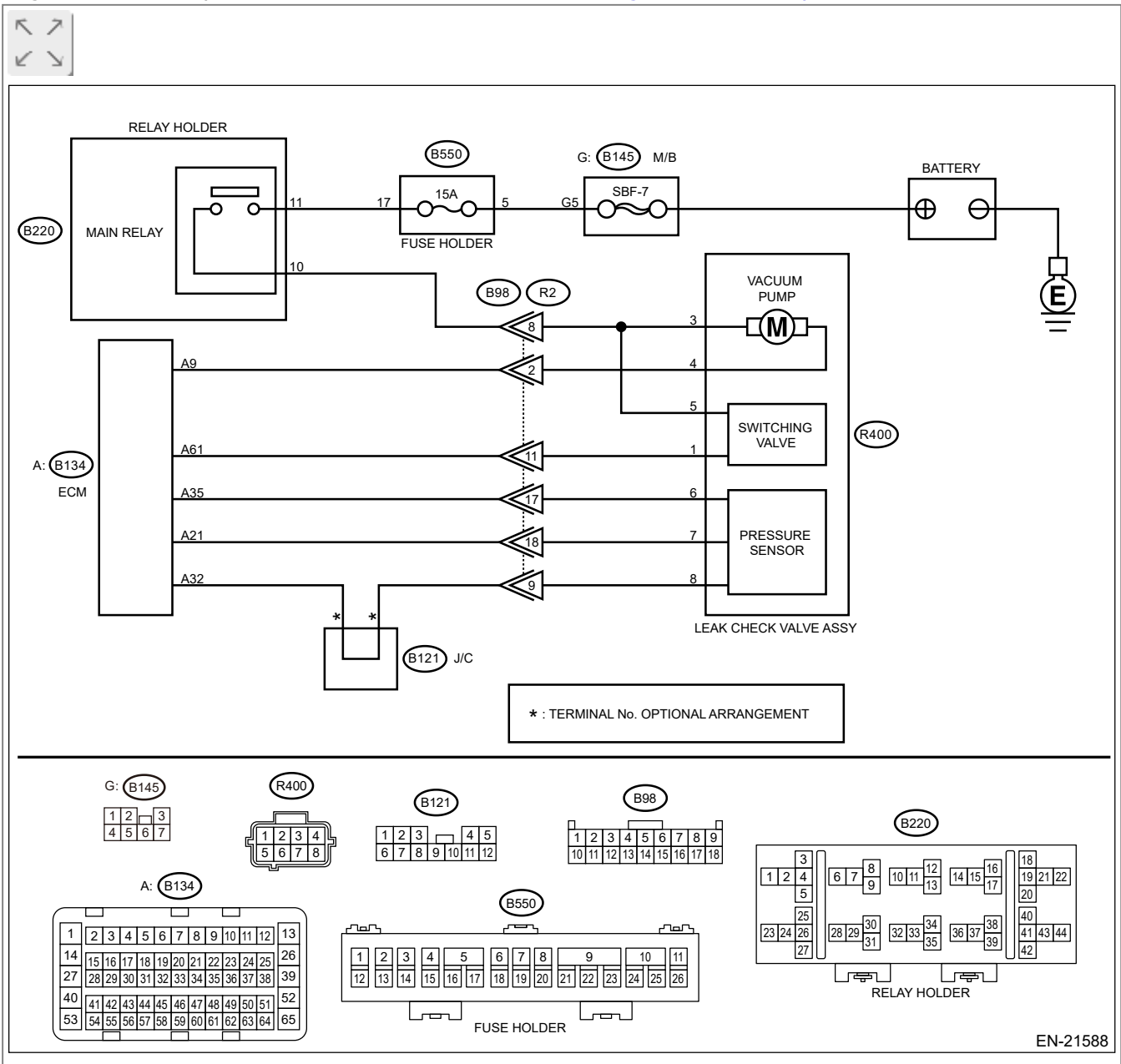
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK CURRENT DATA.



1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Barometric Pressure].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Barometric Pressure] 125 kPa (938 mmHg, 36.9 inHg) or more?

Yes

[Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the leak check valve assembly.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and the leak check valve assembly connector.

Connector & terminal

(B134) No. 21 — (R400) No. 7:

(B134) No. 32 — (R400) No. 8:

Is the resistance less than 1 Ω ?

Yes

[Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and the leak check valve assembly connector**

- **Poor contact of coupling connector**
- **Poor contact of joint connector**

3. CHECK FOR POOR CONTACT.

Check for poor contact of ECM and the leak check valve assembly connector.

Is there poor contact in ECM and the leak check valve assembly connector?


Yes

Repair the poor contact of ECM and the leak check valve assembly connector.

No

 [Go to 4.](#)

4. CHECK LEAK CHECK VALVE ASSEMBLY.


Check the pressure sensor of the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Leak Check Valve Assembly>INSPECTION > CHECK PRESSURE SENSOR.](#)

Is the pressure sensor of the leak check valve assembly OK?

Yes

Repair the short circuit to power in harness between ECM connector and leak check valve assembly connector.

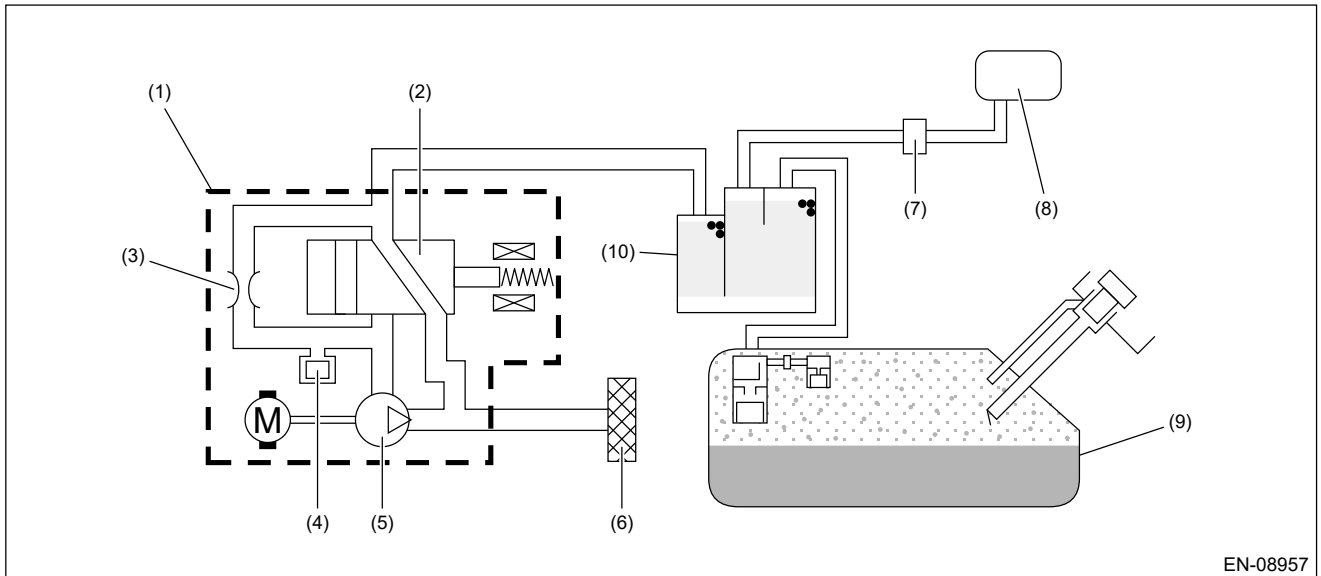
No

Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Leak Check Valve Assembly.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit in Evaporative Leak Check Module pressure sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



- (1) Leak check valve ASSY
- (2) Switching valve
- (3) Reference orifice (0.02 inch orifice)
- (4) Pressure sensor
- (5) Vacuum pump
- (6) Drain filter
- (7) Purge control solenoid valve
- (8) Intake manifold
- (9) Fuel tank
- (10) Canister

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$\geq 4.095\text{V}$

Time needed for diagnosis: 1000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC P0455 EVAP SYSTEM (CPC) LEAK DETECTED (LARGE LEAK)


DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Fuel odor
- There is a hole of more than 1.0 mm (0.04 in) dia. in evaporation system or fuel tank.
- Fuel filler cap loose or lost

Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE..

1. CHECK FUEL FILLER CAP. 

1. Turn the ignition switch to OFF.
2. Check the fuel filler cap.

Note:

The DTC is stored in memory if fuel filler cap is or was loose or if the cap chain has caught while tightening.

Is the fuel filler cap tightened securely?

 [Go to 2.](#)

Tighten fuel filler cap securely.

2. CHECK FUEL FILLER CAP. 


Is the fuel filler cap genuine?

 [Go to 3.](#)


Replace with a genuine fuel filler cap.

3. CHECK FUEL FILLER PIPE GASKET. 


Is there any damage to the seal between fuel filler cap and fuel filler pipe?

Repair or replace the fuel filler cap and fuel filler pipe.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Filler Pipe.](#)

No

 [Go to 4.](#)

4. CHECK PURGE CONTROL SOLENOID VALVE.


Check air-tightness of the purge control solenoid valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Purge Control Solenoid Valve>INSPECTION.](#)

Is the purge control solenoid valve OK?

Yes

 [Go to 5.](#)


No

Replace the purge control solenoid valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Purge Control Solenoid Valve.](#)

5. CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE.

Are there holes on the evaporation line?

Yes

Repair or replace the evaporation line.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Delivery and Evaporation Lines.](#)


No

 [Go to 6.](#)


6. CHECK CANISTER.

Are there holes on the canister?

Yes

Replace the canister.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Canister.](#)


No

 [Go to 7.](#)

7. CHECK LEAK CHECK VALVE ASSEMBLY.

Are there damage or holes on the leak check valve assembly?

Yes


Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Leak Check Valve Assembly.](#)

No

 [Go to 8.](#)


8. CHECK FUEL TANK.



Remove the fuel tank.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Tank.](#)

Are there damage or holes on the fuel tank?

Yes

Repair or replace the fuel tank.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Tank.](#)

No

 [Go to 9.](#)

9. CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM.



Are there holes, cracks, clogging, or disconnection, misconnection of hoses or pipes in evaporative emission control system?

Yes

Repair or replace the hoses or pipes.

No

Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

This diagnosis judges whether the Evaporative Leak Check Module operation is normal or not, and whether the evaporative emission system has leak and clogging or not.

To purge the canister, after driving, perform the five hours soaking after ignition switch OFF in order to stabilize the evaporative gas status. * After 5 or 7 or 9.5 hours passed, ECM is activated by soaking timer, and the leak check is started.

Judges whether the Evaporative Leak Check Module operation is normal or not, by measuring the reference pressure status via reference orifice (0.02 inch orifice). Judge as malfunction if the reference pressure is out of specified range. Then, judge whether there is a leak or not, by comparing the pressure (leak pressure) when the reference pressure and the evaporative emission system are in negative pressure condition. Judge as system leak in the evaporative emission system if the leak pressure is higher than reference pressure. Judge as clogging of pipe if the leak pressure becomes lower than the reference pressure within the specified amount of time.

0.02 inch leak and 0.04 inch leak can be distinguished by measuring the leak pressure.

The diagnosis results are stored inside ECM until the engine is started again.

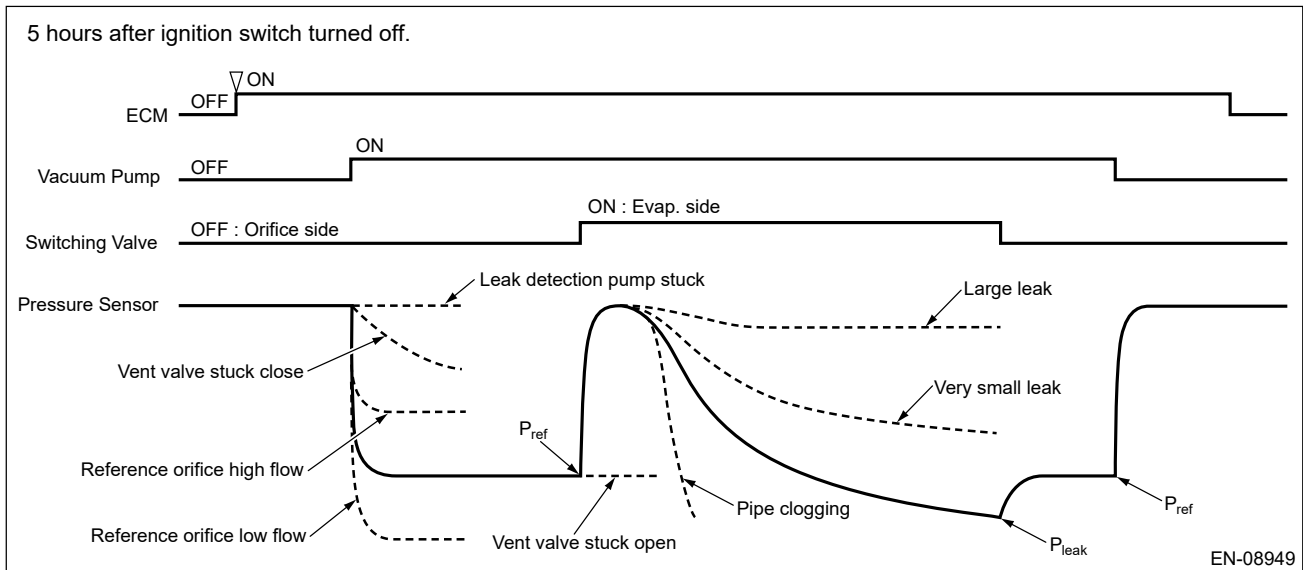
*: When the test conditions are not met in 5 hours, perform diagnosis at elapsed time of 7 hours.

When the test conditions are not met in 7 hours, perform diagnosis at elapsed time of 9.5 hours.

Diagnostic item	
Evaporative Leak Check Module system (leak check valve assembly main body)	Vacuum pump stuck Switching valve stuck to open Switching valve stuck to close

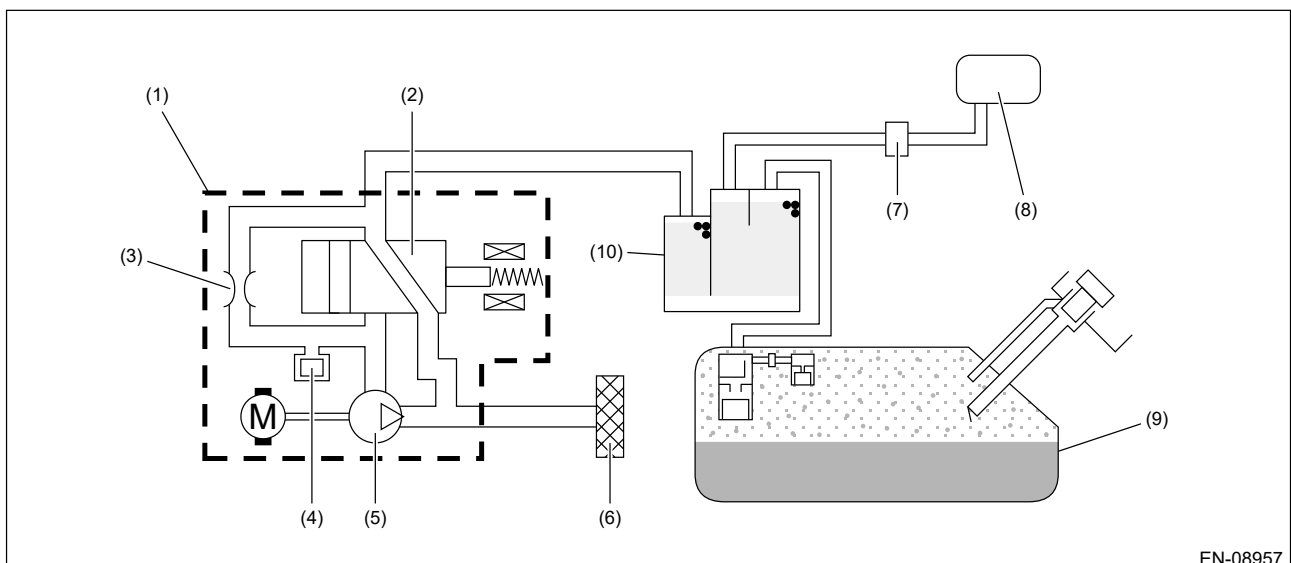
	Reference orifice flow large Reference orifice flow small
Leak check	Large leak <ul style="list-style-type: none"> • 0.04 inch leak • Fuel cap loose • Fuel cap off • System malfunction Very small leak <ul style="list-style-type: none"> • 0.02 inch leak
Clogging of pipe	—

OUTLINE OF DIAGNOSIS



2. COMPONENT DESCRIPTION

Leak check valve assembly consists of the pressure sensor, the reference orifice (diameter of 0.02 inch), the vacuum pump which introduces the negative pressure into evaporative emission system, and the switching valve which switches the passage to introduce the negative pressure.



- | | | |
|---|----------------------------------|---------------|
| (1) Leak check valve ASSY | (5) Vacuum pump | (9) Fuel tank |
| (2) Switching valve | (6) Drain filter | (10) Canister |
| (4) Pressure sensor | (8) Intake manifold | |
| (3) Reference orifice (0.02 inch orifice) | (7) Purge control solenoid valve | |

3. EXECUTION CONDITION


Secondary Parameters	Execution condition
Battery voltage	≥ 10.9V
Barometric pressure	≥ 75.1kPa (563mmHg, 22.2inHg)
Activation of soaking timer	Completed
Engine coolant temperature	≥ 4.4°C (39.9°F) and < 45°C (113°F)
Accumulated purge amount during previous driving cycle	≥ Map 1

Map 1

Calculation × (32 ÷ 1000)

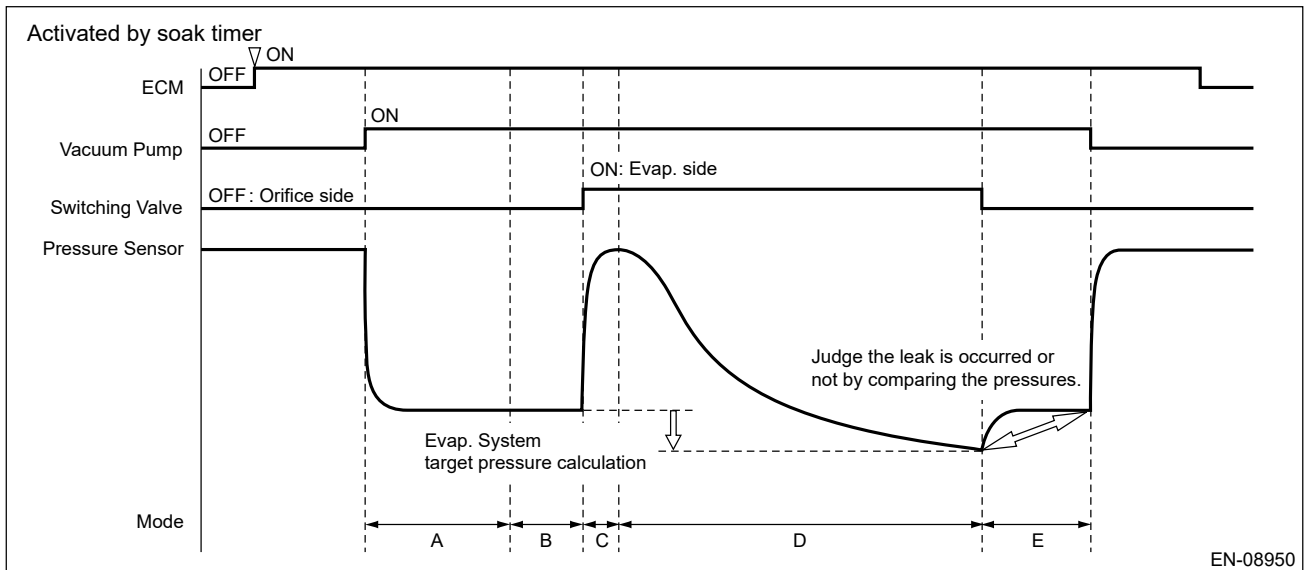
Engine coolant temperature °C (°F)	0 (32)	30 (86)	35 (95)	40 (104)	45 (113)
Accumulated purge amount during previous driving cycle g (oz)	128 (4.51)	128 (4.51)	368 (12.98)	608 (21.44)	848 (29.91)

4. GENERAL DRIVING CYCLE

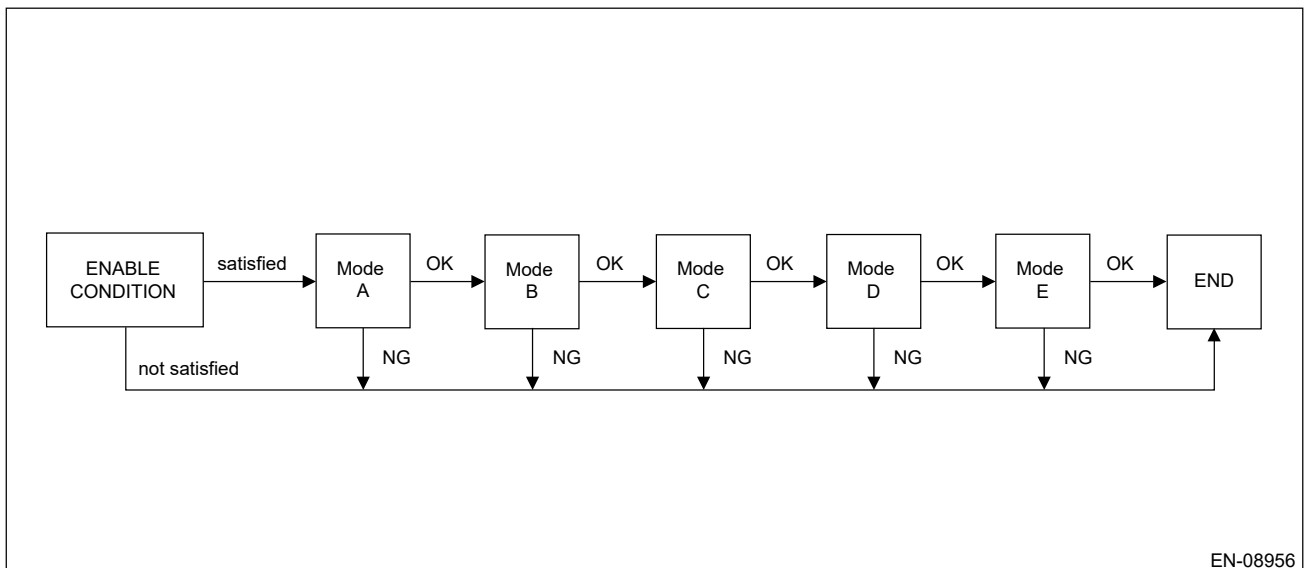
Perform the diagnosis only once when 5 or 7 or 9.5 hours has passed after ignition switch is OFF. For more detail, refer to "OUTLINE OF DIAGNOSIS".  [Ref. to ENGINE \(DIAGNOSTICS\).](#)

[\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0455 EVAP SYSTEM \(CPC\). LEAK DETECTED \(LARGE LEAK\) > OUTLINE OF DIAGNOSIS.](#)

5. DIAGNOSTIC METHOD



Mode	Explanation of Mode	Diagnosis Period
A	Vacuum pump operation confirmation and characteristics stability	7 s or less & 300 s
B	Measurement of reference pressure for setting the target negative pressure	40 s or less
C	Switching valve operation confirmation	12 s or less
D	Clogging of pipe diagnosis and leak pressure measurement	900 s or less
E	Reference pressure measurement for judgment	40 s or less



MODE A (VACUUM PUMP OPERATION CONFIRMATION AND CHARACTERISTICS STABILITY)

Purpose: Detect the vacuum pump operation trouble.

Judge as NG when the following conditions are established.

Judge as OK if the following conditions are not established, and warm up for five minutes to stabilize the vacuum pump characteristics.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Pressure sensor output value	> -224Pa (-1.68mmHg, -0.1inHg)	P2404

MODE B (MEASUREMENT OF REFERENCE PRESSURE FOR SETTING THE TARGET NEGATIVE PRESSURE)

Judgment 1

Purpose: Judge the reference pressure stability.

Judge as NG when the following conditions are established.

Judgment 2

Purpose: Judge whether the reference pressure is within the normal range, and detect the vacuum pump and orifice malfunctions.

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Judgment 1 Pressure sensor maximum output value – Pressure sensor minimum output value or Judgment 2	> 314Pa (2.355mmHg,0.1inHg)	P2404
Reference pressure for setting the target negative pressure	< Value of Map 2 or > Value of Map 3	P2404

Map 2

Barometric pressure kPa (mmHg, inHg)	70 (525, 20.7)	80 (600, 23.6)	90 (675, 26.6)	100 (750, 29.5)
Reference pressure for setting the target negative pressure kPa (mmHg, inHg)	-4 (-29.8, -1.2)	-4.1 (-30.6, -1.2)	-4.2 (-31.4, -1.2)	-4.3 (-32.2, -1.3)

Map 3

Barometric pressure kPa (mmHg, inHg)	70 (525, 20.7)	80 (600, 23.6)	90 (675, 26.6)	100 (750, 29.5)
Reference pressure for setting the target negative pressure kPa (mmHg, inHg)	-0.9 (-7.1, -0.3)	-1 (-7.9, -0.3)	-1.2 (-8.7, -0.3)	-1.3 (-9.5, -0.4)

MODE C (SWITCHING VALVE OPERATION CONFIRMATION)

Purpose: Measure the pressure increase when switching valve is changed from open to close, and detect the stuck to open/close malfunctions of the switching valve.

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Pressure sensor output value –	< 224Pa	P2404

Reference pressure for setting the target negative pressure	(1.68mmHg, 0.1inHg)	
---	---------------------	--

MODE D (CLOGGING OF PIPE DIAGNOSIS AND LEAK PRESSURE MEASUREMENT)

1. Clogging of pipe

Purpose: Measure the time required for the evaporative emission system to reach the target negative pressure by the vacuum pump, and detect the clogging of pipe trouble.

Judge as clogging of pipe malfunction if the evaporative emission system reaches to the target negative pressure within the specified time.

2. Leak pressure measurement

Purpose: Measure the pressure (leak pressure) when the evaporative emission system becomes the negative pressure by the vacuum pump.

Store the pressure as a leak pressure while the following conditions are met.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Time required to reach to the target negative pressure	≤ 34000ms	P1451
<Large leak (0.04 inch)> Leak pressure	≥ Map 6	P0455
<Very small leak (0.02 inch)> Leak pressure	> 0.018 inch reference pressure (Pa) and < Map 6	P0456

Map 6

Reference pressure for judgment (Pa)	-4856	-4000	-2750	-1500	-824
Threshold Value (Pa)	-1785	-1463	-991	-520	-265

MODE E (MEASUREMENT OF REFERENCE PRESSURE FOR JUDGMENT)

Judgment 1

Purpose: Judge the reference pressure stability.

Judge as NG when the following conditions are established.

Judgment 2

Purpose: Judge whether the reference pressure is within the normal range, and detect the vacuum pump and orifice malfunctions. Judge the vacuum pump performance stability.

Judge as NG when the following conditions are established.

Judgment 3

Purpose: Judge the presence of evaporative emission system leak.

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Judgment 1 Pressure sensor maximum output value – Pressure sensor minimum output value	> 314Pa (2.355mmHg, 0.1inHg)	P2404

or Judgment 2 Reference pressure for judgment	< Value of Map 4 or > Value of Map 5	P2404
or Judgment 3 Reference pressure for setting the target negative pressure – Reference pressure for judgment	> 941Pa (7.058mmHg,0.3i nHg)	P2404

Map 4

Barometric pressure kPa (mmHg, inHg)	70 (525, 20.7)	80 (600, 23.6)	90 (675, 26.6)	100 (750, 29.5)
Reference pressure for judgment kPa (mmHg, inHg)	-4.5 (-34.0, -1.3)	-4.6 (-34.8, -1.4)	-4.7 (-35.6, -1.4)	-4.9 (-36.4, -1.4)

Map 5

Barometric pressure kPa (mmHg, inHg)	70 (525, 20.7)	80 (600, 23.6)	90 (675, 26.6)	100 (750, 29.5)
Reference pressure for judgment kPa (mmHg, inHg)	-0.8 (-6.2, -0.2)	-0.9 (-7.0, -0.3)	-1 (-7.8, -0.3)	-1.1 (-8.58, -0.3)

Time needed for diagnosis: Approx. 24 min


At next engine start, confirm whether the enable conditions are satisfied even though refueling has been done during soaking, and determine the malfunction.

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P0456 EVAP SYSTEM (CPC) LEAK DETECTED (VERY SMALL LEAK)

Note:

For the diagnostic procedure, refer to DTC P0455.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0455 EVAP SYSTEM \(CPC\) LEAK DETECTED \(LARGE LEAK\).](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0455.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0455 EVAP SYSTEM \(CPC\) LEAK DETECTED \(LARGE LEAK\).](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0458 EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT LOW



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

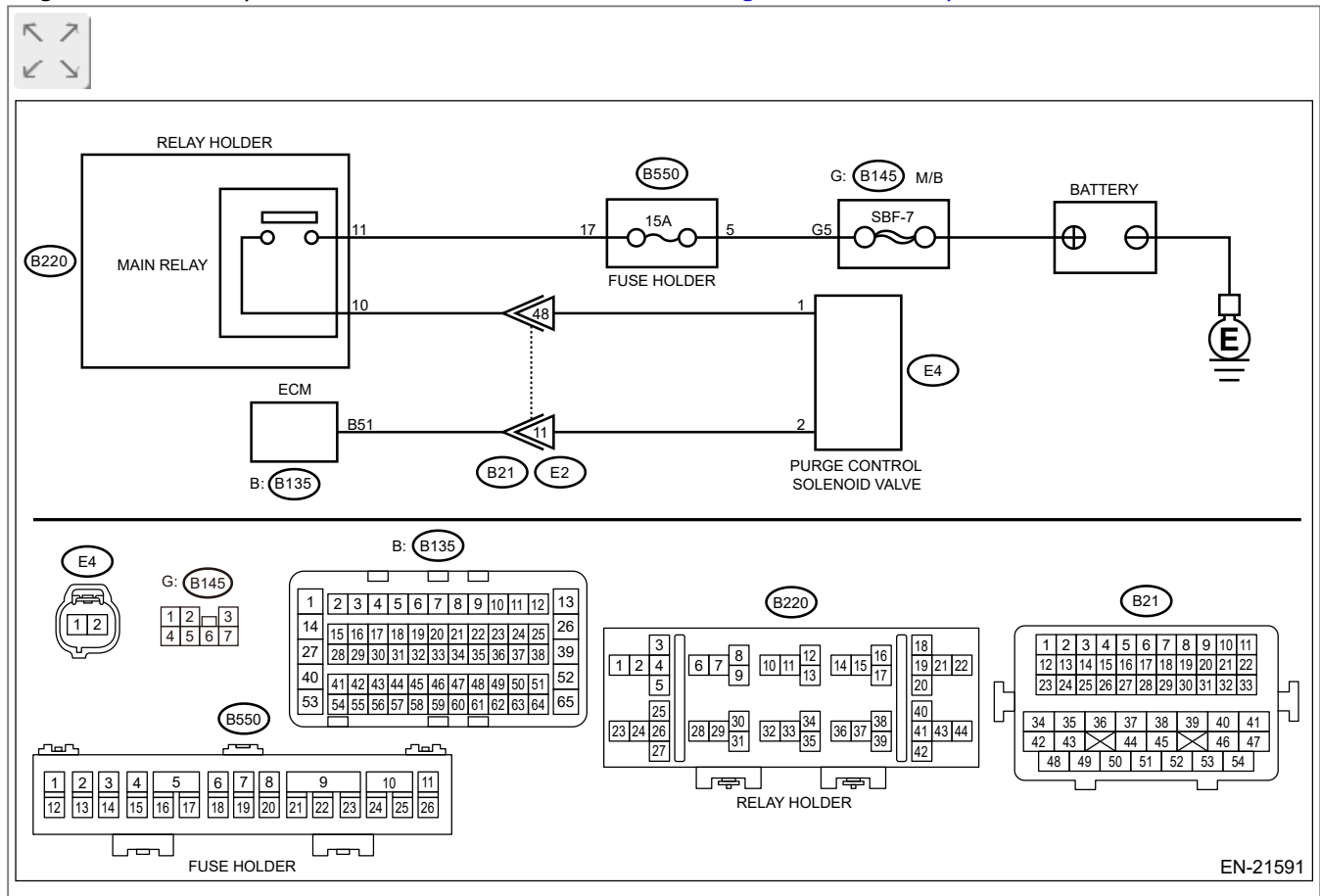
Improper idling

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



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1. CHECK OUTPUT SIGNAL OF ECM.


1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B135) No. 51 (+) – Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

 [Go to 3.](#)

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes

Repair the poor contact of ECM connector.

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary open or short circuit of harness or temporary poor contact of connector may be the cause.

3. CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE.


Measure the voltage between purge control solenoid valve connector and engine ground.

Connector & terminal

(E4) No. 1 (+) – Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

Repair the power supply circuit.

4. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from the purge control solenoid valve.
3. Disconnect the connector from ECM.
4. Measure the resistance between the purge control solenoid valve connector and engine ground.

Connector & terminal

(E4) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM connector and purge control solenoid valve connector.

5. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE CONNECTOR.

Measure the resistance of harness between ECM connector and purge control solenoid valve.

Connector & terminal

(B135) No. 51 — (E4) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 6.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and purge control solenoid valve connector**
- **Poor contact of coupling connector**

6. CHECK PURGE CONTROL SOLENOID VALVE.

1. Remove the purge control solenoid valve.
2. Measure the resistance between purge control solenoid valve terminals.

Terminals


No. 1 —No. 2:

Is the resistance 10 — 100 Ω ?

Yes

Repair the poor contact of purge control solenoid valve connector.

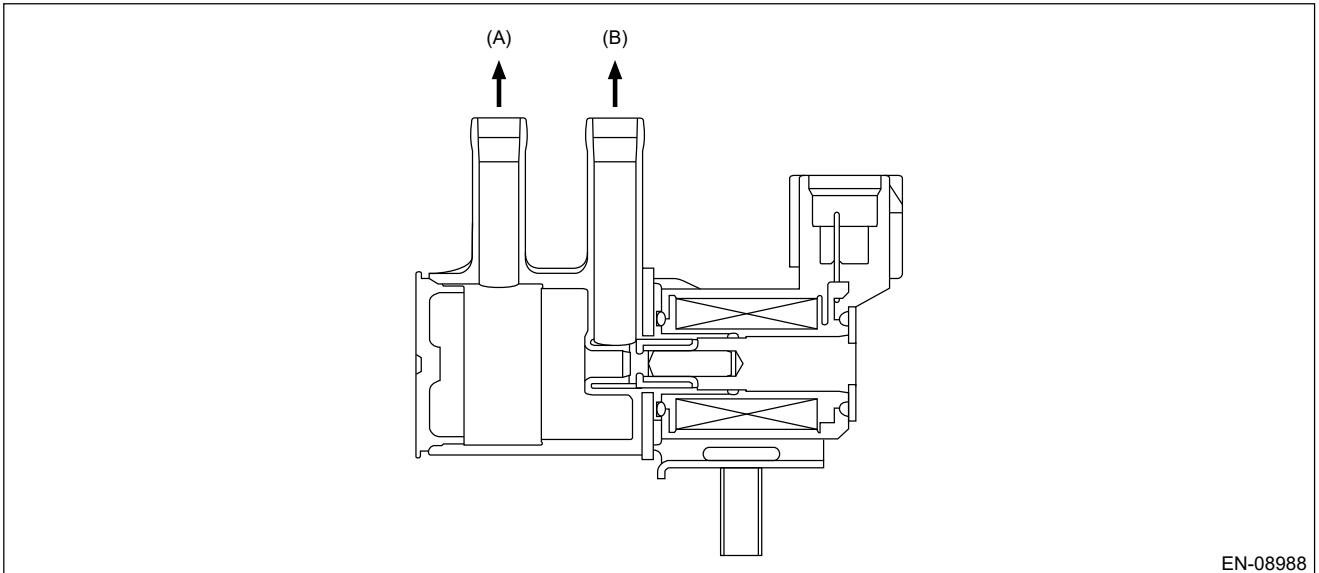
No

Replace the purge control solenoid valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Purge Control Solenoid Valve.](#)

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of the purge control solenoid valve.
 Judge as NG when the ECM output level differs from the actual terminal level.

2. COMPONENT DESCRIPTION



(A) To canister

(B) To intake manifold

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Purge control solenoid valve control duty	$< 75\%$

4. GENERAL DRIVING CYCLE

Perform the diagnosis every time after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Terminal output voltage	$\leq \text{Battery voltage} \times 0.34 \text{ V}$

Time needed for diagnosis: 2500ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0459 EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT HIGH



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

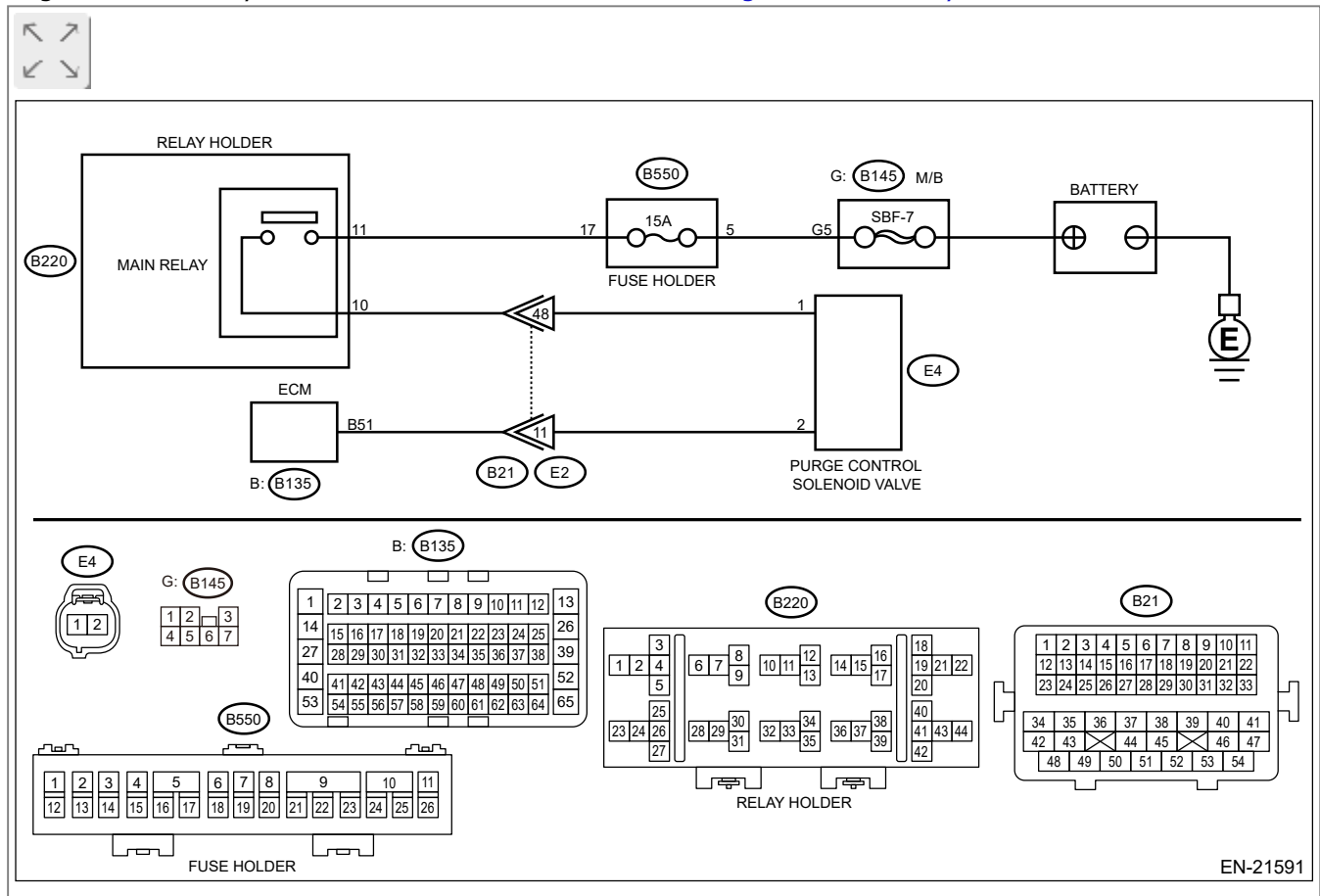
Improper idling

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



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1. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the purge control solenoid valve.
3. Disconnect the connector from ECM.

4. Turn the ignition switch to ON.
5. Measure the voltage between ECM connector and chassis ground.

Connector & terminal


(B135) No. 51 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power in the harness between ECM connector and purge control solenoid valve connector.

No

 [Go to 2.](#)

2. CHECK PURGE CONTROL SOLENOID VALVE.


1. Turn the ignition switch to OFF.
2. Measure the resistance between purge control solenoid valve terminals.

Terminals

No. 1 —No. 2:

Is the resistance less than 1 Ω ?

Yes

Replace the purge control solenoid valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Purge Control Solenoid Valve.](#)

No

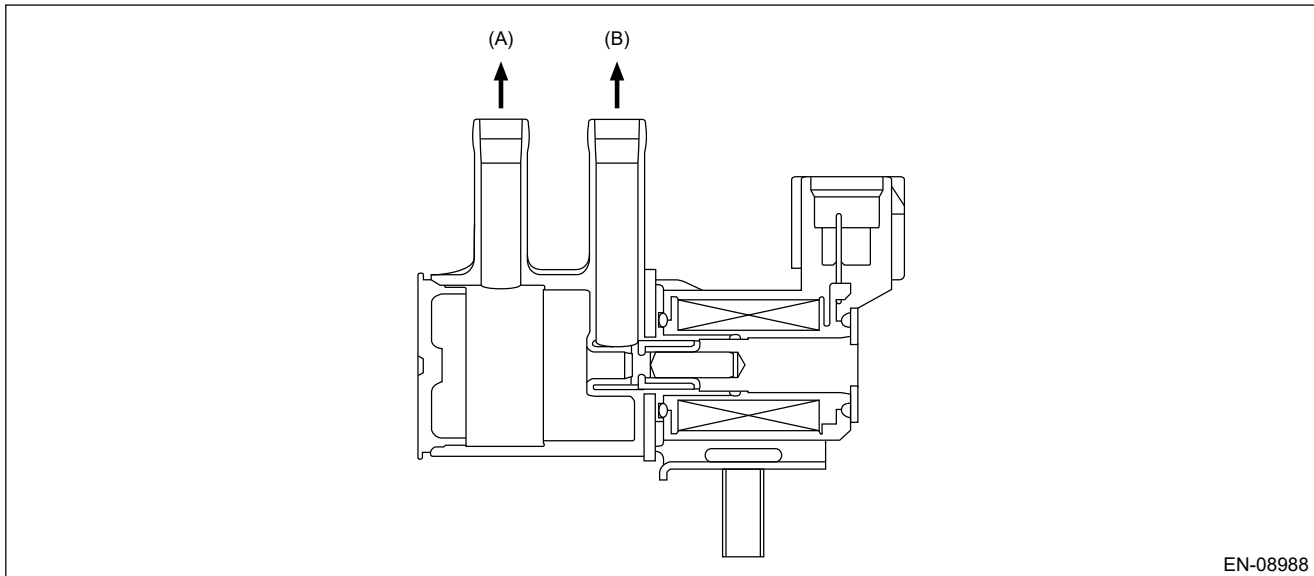
Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of the purge control solenoid valve.

Judge as NG when the ECM output level differs from the actual terminal level.

2. COMPONENT DESCRIPTION



(A) To canister

(B) To intake manifold

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Purge control solenoid valve control duty	$\geq 25\%$

4. GENERAL DRIVING CYCLE

Perform the diagnosis every time after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Terminal output current	$\geq 12\text{A}$

Time needed for diagnosis: 2500ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0500 VEHICLE SPEED SENSOR "A" CIRCUIT

DTC detecting condition:

Immediately at fault recognition

Caution:


After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE..

1. CHECK DTC OF VDC.

Check DTC of VDC.

Is DTC of VDC displayed?

Yes

Perform the diagnosis according to DTC.  Ref. to BODY CONTROL(DIAGNOSTICS)>List of Diagnostic Trouble Code (DTC).

No

Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Judge as NG when outside of the judgment value.

Judge NG when the received data from VDCCM&H/U is abnormal vehicle speed, and the vehicle speed data is impossible.

2. COMPONENT DESCRIPTION

Vehicle speed signals are taken in to the VDC control module and hydraulic control unit, and normal/erroneous data of the ABS wheel speed sensor is received by CAN communication from the VDC control module and hydraulic control unit.

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Vehicle speed (front wheel) from vehicle dynamics control (VDC) module Note: The vehicle dynamics control module detects malfunction if either of front wheel speed sensor does not output a signal and the other vehicle speed sensor output signal is above 7.46 MPH	≥ 300km/h (186.4MPH)

Time needed for diagnosis: 2500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0506 IDLE CONTROL SYSTEM RPM - LOWER THAN EXPECTED



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Hard to start the engine.
- Engine does not start.
- Improper idling
- Engine stalls.


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE.

1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


 [Go to 2.](#)

2. CHECK AIR CLEANER ELEMENT.

1. Turn the ignition switch to OFF.
2. Check the air cleaner element.

Is there excessive clogging on air cleaner element?

Yes

Replace the air cleaner element.  [Ref. to INTAKE \(INDUCTION\) \(H4DO\)>Air Cleaner Element.](#)

No

 [Go to 3.](#)

3. CHECK ELECTRONIC THROTTLE CONTROL.

1. Remove the electronic throttle control.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\).](#)

[\(H4DO\)>Throttle Body>REMOVAL.](#)


2. Check the electronic throttle control.

Are foreign matter found inside electronic throttle control?

Yes

Remove foreign matter from electronic throttle control.

No

Perform the diagnosis of DTC P2101.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P2101 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE.](#)

1. OUTLINE OF DIAGNOSIS

Detect the malfunction that actual engine speed is not close to target engine speed during idling.
Judge as NG when actual engine speed is not close to target engine speed during idling.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Barometric pressure	≥ 75.1kPa (563mmHg,22.2in Hg)
Lambda value (left and right)	≥ 0.85 and < 1.151
Vehicle speed	= 0 km/h (0 MPH)
Engine coolant temperature	≥ 60°C (140°F)
Elapsed time after starting the engine	≥ 10s
Accelerator pedal position	= 0%
Elapsed time after gear position change (P ↔ D or N ↔ D)	> 5s
Cold start diagnosis	Not in operation
Main feedback	In operation
Idle speed control feedback	In operation

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously at idling after warming up engine.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Actual engine speed – Targeted engine speed	< –100rpm

Time needed for diagnosis: 15s × 1time(s)

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0507 IDLE CONTROL SYSTEM RPM - HIGHER THAN EXPECTED



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

Engine keeps running at higher speed than specified idle speed.


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE..

1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 2.](#)

2. CHECK AIR INTAKE SYSTEM.

1. Start and idle the engine.
2. Check the following items.
 - Loose installation of intake manifold and throttle body
 - Cracks of intake manifold gasket and throttle body gasket
 - Disconnection of vacuum hoses

Is there any fault in air intake system?

Yes


Repair air suction and leaks.

No

 [Go to 3.](#)

3. CHECK ELECTRONIC THROTTLE CONTROL.

1. Turn the ignition switch to OFF.


2. Remove the electronic throttle control.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Throttle Body>REMOVAL.](#)
3. Check the electronic throttle control.

Are foreign matter found inside electronic throttle control?

Yes

Remove foreign matter from electronic throttle control.

No

Perform the diagnosis of DTC P2101.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P2101 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE.](#)

1. OUTLINE OF DIAGNOSIS

Detect the malfunction that actual engine speed is not close to target engine speed during idling. Judge as NG when actual engine speed is not close to target engine speed during idling.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Barometric pressure	≥ 75.1kPa (563mmHg,22.2in Hg)
Lambda value (left and right)	≥ 0.85 and < 1.151
Vehicle speed	= 0 km/h (0 MPH)
Engine coolant temperature	≥ 60°C (140°F)
Elapsed time after starting the engine	≥ 10s
Accelerator pedal position	= 0%
Elapsed time after gear position change (P ↔ D or N ↔ D)	> 5s
Cold start diagnosis	Not in operation
Main feedback	In operation
Idle speed control feedback	In operation

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously at idling after warming up engine.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Actual engine speed – Targeted engine speed	> 200rpm

Time needed for diagnosis: 15s × 1time(s)

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC P050A COLD START IDLE CONTROL SYSTEM PERFORMANCE



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Engine keeps running at higher speed than specified idle speed.
- Engine keeps running at a lower speed than the specified idle speed.
- Engine stalls.

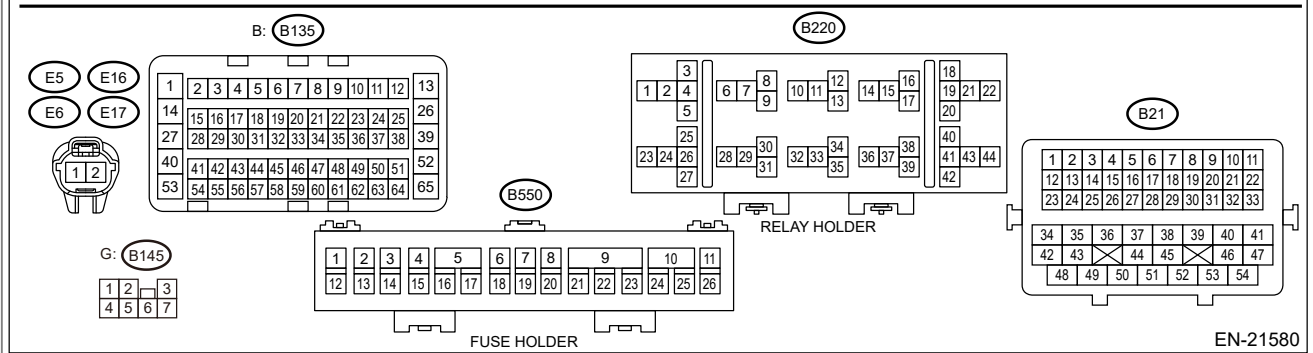
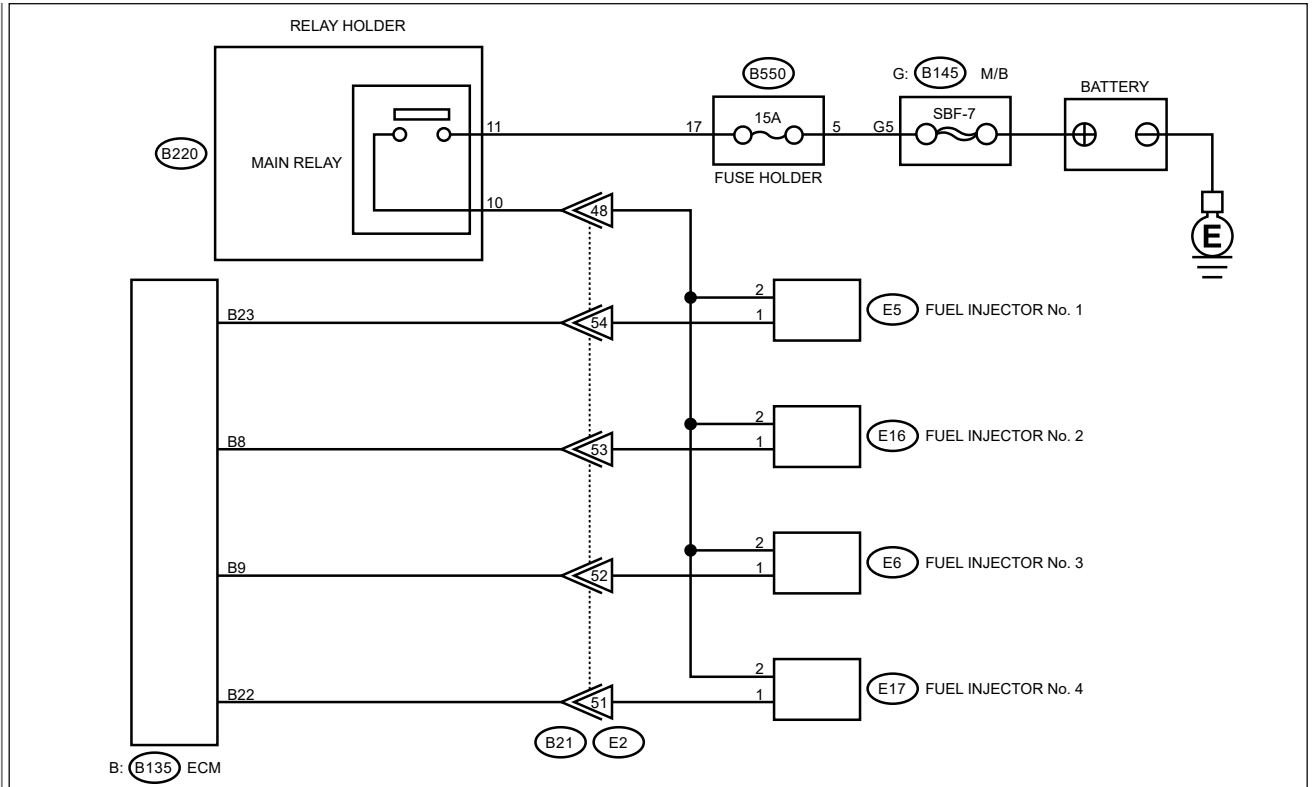
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

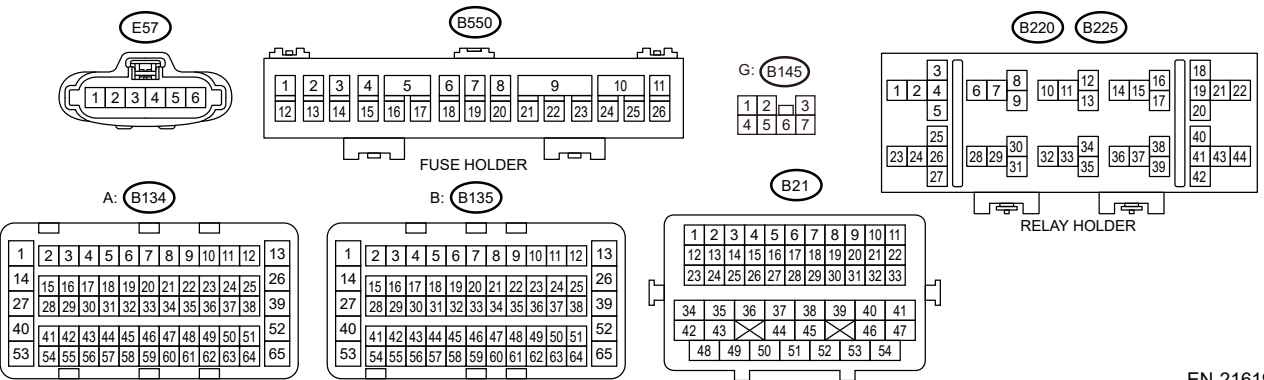
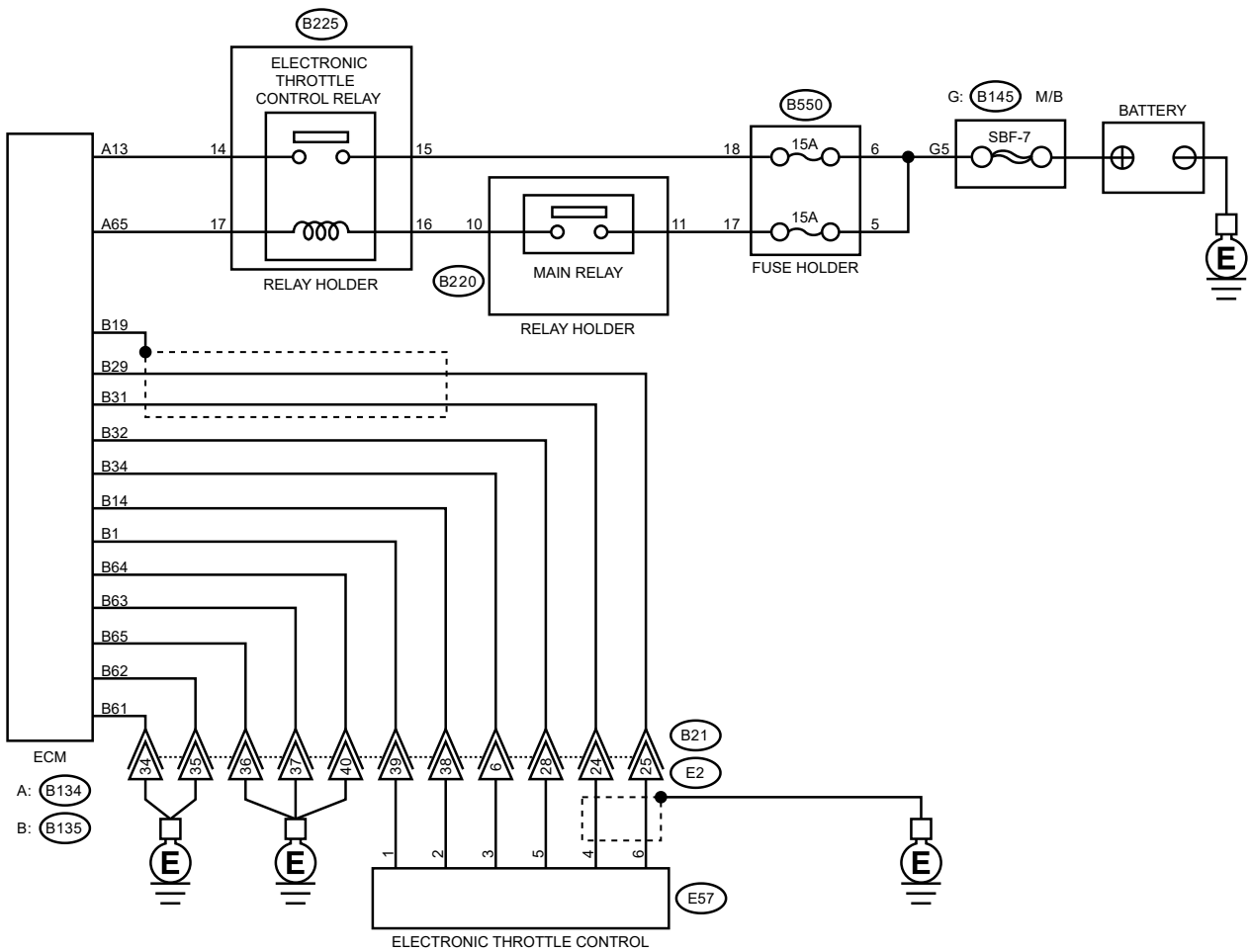
Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





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1. CHECK FOR ANY OTHER DTC ON DISPLAY.



Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 2.](#)

2. CHECK ENGINE OIL.



Is there a proper amount of engine oil?

Yes

[Go to 3.](#)

No

Replace engine oil. [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)

3. CHECK EXHAUST SYSTEM.



Are there holes or loose bolts on exhaust system?

Yes

Repair the exhaust system.

No

[Go to 4.](#)

4. CHECK AIR INTAKE SYSTEM.



Are there holes, loose bolts or disconnection of hose on air intake system?

Yes

Repair the air intake system.

No

[Go to 5.](#)

5. CHECK FUEL PRESSURE.



Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.

Measure the fuel pressure. [Ref. to MECHANICAL\(H4DO\)>Fuel Pressure>INSPECTION.](#)

Caution:

Release fuel pressure before removing the fuel pressure gauge.


Is the measured value 340 – 400 kPa (3.5 – 4.1 kg/cm², 49 – 58 psi)?

Yes

[Go to 6.](#)

No

Check the fuel pump and fuel delivery line. [Ref. to FUEL INJECTION \(FUEL](#)

[SYSTEMS\)\(H4DO\)>Fuel Pump>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Delivery and Evaporation Lines>INSPECTION.](#)

6. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Coolant Temp.].

Note:

- **Subaru Select Monitor**


For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)

- **General scan tool**


For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Coolant Temp.] 75°C (167°F) or more?

Yes

 [Go to 7.](#)

No

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Coolant Temperature Sensor.](#)

7. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. For CVT models, set the select lever to "P" range or "N" range, and for MT models, place the shift lever in the neutral position.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Using the Subaru Select Monitor or a general scan tool, read the value of [Air Flow Rate from Mass Air Flow Sensor].

Note:

- **Subaru Select Monitor**

For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)

- **General scan tool**


For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Air Flow Rate from Mass Air Flow Sensor] 2.0 — 5.0 g/s (0.26 — 0.66 lb/m)?

Yes

 [Go to 8.](#)

No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature](#)

[Sensor.](#)

8. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. For CVT models, set the select lever to "P" range or "N" range, and for MT models, place the shift lever in the neutral position.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Open the front hood.
6. Measure the ambient temperature.
7. Using the Subaru Select Monitor or a general scan tool, read the value of [Intake Air Temp.].

Note:

- **Subaru Select Monitor**


For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)

- **General scan tool**


For detailed operation procedures, refer to the general scan tool operation manual.

Subtract ambient temperature from [Intake Air Temp.]. Is the obtained value $-10 - 50^{\circ}\text{C}$ ($-18 - 90^{\circ}\text{F}$)?

Yes

 [Go to 9.](#)

No

Check the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

9. CHECK OUTPUT SIGNAL OF ECM.


1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and chassis ground on faulty cylinders.

Connector & terminal


- #1 (B135) No. 23 (+) — Chassis ground (-):
- #2 (B135) No. 8 (+) — Chassis ground (-):
- #3 (B135) No. 9 (+) — Chassis ground (-):
- #4 (B135) No. 22 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 14.](#)

No

 [Go to 10.](#)

10. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector on faulty cylinders.
3. Measure the resistance between fuel injector connector and engine ground on faulty cylinders.

Connector & terminal

- #1 (E5) No. 1 — Engine ground:
- #2 (E16) No. 1 — Engine ground:
- #3 (E6) No. 1 — Engine ground:
- #4 (E17) No. 1 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 11.](#)

No

Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

11. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.



Measure the resistance of harness between ECM and fuel injector connector on faulty cylinders.

Connector & terminal

- #1 (B135) No. 23 — (E5) No. 1:
- #2 (B135) No. 8 — (E16) No. 1:
- #3 (B135) No. 9 — (E6) No. 1:
- #4 (B135) No. 22 — (E17) No. 1:

Is the resistance less than 1 Ω?

Yes

 [Go to 12.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and fuel injector connector**
- **Poor contact of coupling connector**

12. CHECK FUEL INJECTOR.




Measure the resistance between fuel injector terminals on faulty cylinder.

Terminals


No. 1 —No. 2:

Is the resistance 5 — 20 Ω ?

Yes

 [Go to 13.](#)

No

Replace the faulty fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Injector.](#)

13. CHECK POWER SUPPLY LINE.

1. Turn the ignition switch to ON.
2. Measure the voltage between fuel injector and engine ground on faulty cylinders.

Connector & terminal

- #1 (E5) No. 2 (+) — Engine ground (–):
- #2 (E16) No. 2 (+) — Engine ground (–):
- #3 (E6) No. 2 (+) — Engine ground (–):
- #4 (E17) No. 2 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

Repair the poor contact of all connectors in fuel injector circuit.

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between the main relay connector and fuel injector connector on faulty cylinders**
- **Poor contact of coupling connector**
- **Poor contact of main relay connector**

14. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector on faulty cylinders.
3. Turn the ignition switch to ON.
4. Measure the voltage between ECM and chassis ground on faulty cylinders.

Connector & terminal

- #1 (B135) No. 23 (+) — Chassis ground (–):
- #2 (B135) No. 8 (+) — Chassis ground (–):
- #3 (B135) No. 9 (+) — Chassis ground (–):


#4 (B135) No. 22 (+) — Chassis ground (—):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power in harness between ECM connector and fuel injector.

No

 [Go to 15.](#)

15. CHECK FUEL INJECTOR.


1. Turn the ignition switch to OFF.
2. Measure the resistance between fuel injector terminals on faulty cylinder.

Terminals


No. 1 —No. 2:

Is the resistance 5 — 20 Ω ?

Yes

 [Go to 16.](#)



No

Replace the faulty fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Injector.](#)


16. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR/CRANKSHAFT POSITION SENSOR.

Is the camshaft position sensor or crankshaft position sensor loosely installed?

Yes

Tighten the camshaft position sensor or crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Camshaft Position Sensor>INSTALLATION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Crankshaft Position Sensor>INSTALLATION.](#)


No

 [Go to 17.](#)


17. CHECK CRANKSHAFT POSITION SENSOR PLATE.

Is the crankshaft position sensor plate rusted or does it have broken teeth?

Yes

Replace the crankshaft position sensor plate.  [Ref. to MECHANICAL\(H4DO\)>Cylinder Block.](#)

No

 [Go to 18.](#)


18. CHECK INSTALLATION CONDITION OF TIMING CHAIN.

Turn the crankshaft using ST, and align the alignment mark on crank sprocket with alignment mark on cylinder block.


ST 18252AA000 CRANKSHAFT SOCKET

Is the timing chain dislocated from its proper position?

Yes

Correct the installation condition of timing chain.  [Ref. to MECHANICAL\(H4DO\)>Timing Chain Assembly.](#)

No

 [Go to 19.](#)

19. CHECK ELECTRONIC THROTTLE CONTROL RELAY.

1. Turn the ignition switch to OFF.
2. Remove the electronic throttle control relay.
3. Connect the battery to terminals No. 16 and No. 17 of electronic throttle control relay.
4. Measure the resistance between electronic throttle control relay terminals.

Terminals


No. 14 —No. 15:

Is the resistance less than 1 Ω ?

Yes

 [Go to 20.](#)

No

Replace the electronic throttle control relay.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Electronic Throttle Control Relay.](#)

20. CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY.

Measure the voltage between electronic throttle control relay connector and chassis ground.

Connector & terminal

(B225) No. 15 (+) — Chassis ground (—):

Is the voltage 10 V or more?

Yes

 [Go to 21.](#)

No

Repair the open or short to ground in the power supply circuit.

21. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY CONNECTOR.

1. Disconnect the connector from ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between electronic throttle control relay connector and chassis ground.

Connector & terminal


(B225) No. 17 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power in the harness between ECM connector and electronic throttle control relay connector.

No

 [Go to 22.](#)

22. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the resistance between electronic throttle control relay connector and chassis ground.


Connector & terminal

(B225) No. 14 — Chassis ground:

(B225) No. 17 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 23.](#)

No

Repair the short circuit to ground in harness between ECM connector and electronic throttle control relay connector.

23. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY CONNECTOR.

Measure the resistance of harness between ECM connector and electronic throttle control relay connector.


Connector & terminal

(B134) No. 65 — (B225) No. 17:

(B134) No. 13 — (B225) No. 14:

Is the resistance less than 1 Ω ?

Yes

 [Go to 24.](#)

No

Repair the open circuit in harness between ECM connector and electronic throttle control relay connector.

24. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from electronic throttle control.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

- (B135) No. 32 — Chassis ground:
- (B135) No. 29 — Chassis ground:
- (B135) No. 29 — (B135) No. 65:
- (B135) No. 31 — Chassis ground:
- (B135) No. 31 — (B135) No. 65:

Is the resistance 1 M Ω or more?

Yes

 [Go to 25.](#)

No

Repair the ground short circuit of harness between ECM connector and electronic throttle control connector.

25. CHECK SHORT CIRCUIT INSIDE THE ECM.


1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal


- (E57) No. 6 — Engine ground:
- (E57) No. 4 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 26.](#)

No

Repair the ground short circuit of harness between ECM connector and electronic throttle control connector. Replace the ECM if defective.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)

26. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.




1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and electronic throttle control connector.

Connector & terminal

- (B135) No. 29 — (E57) No. 6:
- (B135) No. 31 — (E57) No. 4:
- (B135) No. 34 — (E57) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 27.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and electronic throttle control connector**
- **Poor contact of coupling connector**

27. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.




1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

- (E57) No. 3 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 28.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and engine ground**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

28. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.



1. Turn the ignition switch to ON.
2. Measure the voltage between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 6 (+) — Engine ground (–):


(E57) No. 4 (+) — Engine ground (–):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in the harness between ECM connector and electronic throttle control connector.

No

 [Go to 29.](#)

29. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.


Connector & terminal

(B135) No. 32 — (B135) No. 29:

(B135) No. 32 — (B135) No. 31:

Is the resistance 1 M Ω or more?

Yes

 [Go to 30.](#)

No

Repair the short circuit to power in the harness between ECM connector and electronic throttle control connector.

30. CHECK SENSOR OUTPUT.


1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Using the Subaru Select Monitor, read the value in [Main-Throttle Sensor].

Note:


For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)

Is the value of [Main-Throttle Sensor] 0.81 — 0.87 V?

Yes

 [Go to 31.](#)

No

Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective.  [Ref. to FUEL INJECTION \(FUEL](#)

31. CHECK SENSOR OUTPUT.


Using the Subaru Select Monitor, read the value in [Sub-Throttle Sensor].

Note:


For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)

Is the value of [Sub-Throttle Sensor] 1.64 — 1.70 V?

Yes

 [Go to 32.](#)

No

Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Throttle Body.](#)

32. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from electronic throttle control.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM connector and electronic throttle control connector.


Connector & terminal

(B135) No. 14 — (E57) No. 2:

(B135) No. 1 — (E57) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 33.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and electronic throttle control connector**
- **Poor contact of coupling connector**

33. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Connect the connector to ECM.

2. Turn the ignition switch to ON.
3. Measure the voltage between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 2 (+) — Engine ground (–):


(E57) No. 1 (+) — Engine ground (–):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in the harness between ECM connector and electronic throttle control connector.

No

 [Go to 34.](#)

34. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between electronic throttle control connector and engine ground.


Connector & terminal

(E57) No. 2 — Engine ground:

(E57) No. 1 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 35.](#)

No

Repair the ground short circuit of harness between ECM connector and electronic throttle control connector.

35. CHECK HARNESS BETWEEN ELECTRONIC THROTTLE CONTROL CONNECTOR.


Measure the resistance between electronic throttle control connectors.

Connector & terminal

(E57) No. 2 — (E57) No. 1:

Is the resistance 1 MΩ or more?

Yes

 [Go to 36.](#)

No

Repair the short circuit in harness between ECM connector and electronic throttle control connector.

36. CHECK ELECTRONIC THROTTLE CONTROL GROUND CIRCUIT.



Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B135) No. 61 — Chassis ground:

(B135) No. 62 — Chassis ground:

(B135) No. 63 — Chassis ground:

(B135) No. 64 — Chassis ground:

(B135) No. 65 — Chassis ground:

Is the resistance less than 5 Ω ?

Yes

[Go to 37.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and engine ground**
- **Poor contact of coupling connector**

37. CHECK ELECTRONIC THROTTLE CONTROL.



Measure the resistance between electronic throttle control terminals.

Terminals

No. 2 —No. 1:

Is the resistance 50 Ω or less?

Yes

[Go to 38.](#)

No

Replace the electronic throttle control. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Throttle Body.](#)

38. CHECK ELECTRONIC THROTTLE CONTROL.



Move the throttle valve to the fully opened and fully closed positions with fingers.
Check that the valve returns to the specified position when releasing fingers.

Does the valve return to the specified position? Standard value: 3 mm (0.12 in) from fully closed position

Yes

Repair the poor contact of ECM connector.

No

Replace the electronic throttle control. [Ref. to FUEL INJECTION \(FUEL](#)

1. OUTLINE OF DIAGNOSIS

WHEN COLD, THE ABNORMALITY IN THE CONTROL OF TARGET ENGINE SPEED INCREASE IS DETECTED. (P050A)

- Idle speed diagnosis
Judge as NG when actual engine speed is not close to target engine speed at cold start.

DETECT MALFUNCTIONS OF THE CATALYST ADVANCED IDLING RETARD ANGLE CONTROL. (P050B)

Judge as NG when ECM is not controlling the angle properly during catalyst advanced idling retard angle control.

- Final ignition timing diagnosis
Judge as NG when actual retard amount is under the specified value at cold start.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
<Idle speed diagnosis>	
Battery voltage	≥ 10.9 V
Barometric pressure	≥ 75.1kPa (563mmHg, 22.2inHg)
Vehicle speed	≤ 2km/h (1.2MPH)
Engine coolant temperature	≤ 60°C (140°F)
Throttle position	< 0.37°
Integrated value of intake air amount	< Value of Map 1
Elapsed time after gear position change (P ↔ D or N ↔ D) (CVT model)	≥ 3000ms
Elapsed time after gear position change (MT model)	≥ 3000ms
Elapsed time after starting the engine	≥ 2000ms
<Final ignition timing diagnosis>	
Battery voltage	≥ 10.9 V
Barometric pressure	≥ 75.1kPa (563mmHg, 22.2inHg)
Vehicle speed	≤ 2km/h (1.2MPH) (CVT model) ≤ 2km/h (1.2MPH) (MT

Map 3 (CVT model)

Engine coolant temperature °C (°F)	-40 (-40)	-30 (-22)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)	50 (122)	60 (140)
Target retard amount	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5

Map 3 (MT model)

Engine coolant temperature °C (°F)	-40 (-40)	-30 (-22)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)	50 (122)	60 (140)
Target retard amount	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5

3. GENERAL DRIVING CYCLE

Perform the diagnosis at cold start.

4. DIAGNOSTIC METHOD

IDLE SPEED DIAGNOSIS

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Actual engine speed – Target engine speed	< Value of Map 4

Map 4 (CVT model)

Engine coolant temperature °C (°F)	-40 (-40)	-30 (-22)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)	50 (122)	60 (140)
Threshold Value	-300	-300	-300	-300	-300	-300	-300	-300	-300	-300	-300

Map 4 (MT model)

Engine coolant temperature °C (°F)	-40 (-40)	-30 (-22)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)	50 (122)	60 (140)
Threshold Value	-300	-300	-300	-300	-300	-300	-300	-300	-300	-300	-300

Time needed for diagnosis: 7000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

FINAL IGNITION TIMING DIAGNOSIS

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
----------------------	-----------------

Final ignition timing – ignition timing during CSERS* *: Ignition timing during CSERS (Cold Start Emission Reduction Strategy) = Base ignition timing – retard amount	> Value of Map 5
--	------------------

Map 5 (CVT model)

Engine coolant temperature °C (°F)	-40 (-40)	-30 (-22)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)	50 (122)	60 (140)
Threshold Value	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5

Map 5 (MT model)

Engine coolant temperature °C (°F)	-40 (-40)	-30 (-22)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)	50 (122)	60 (140)
Threshold Value	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5


Time needed for diagnosis: 7000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P050B COLD START IGNITION TIMING PERFORMANCE

Note:

For the diagnostic procedure, refer to DTC P050A.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P050A COLD START IDLE CONTROL SYSTEM PERFORMANCE.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P050A.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P050A COLD START IDLE CONTROL SYSTEM PERFORMANCE.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0512 STARTER (SWITCH) REQUEST CIRCUIT


DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

Failure of engine to start

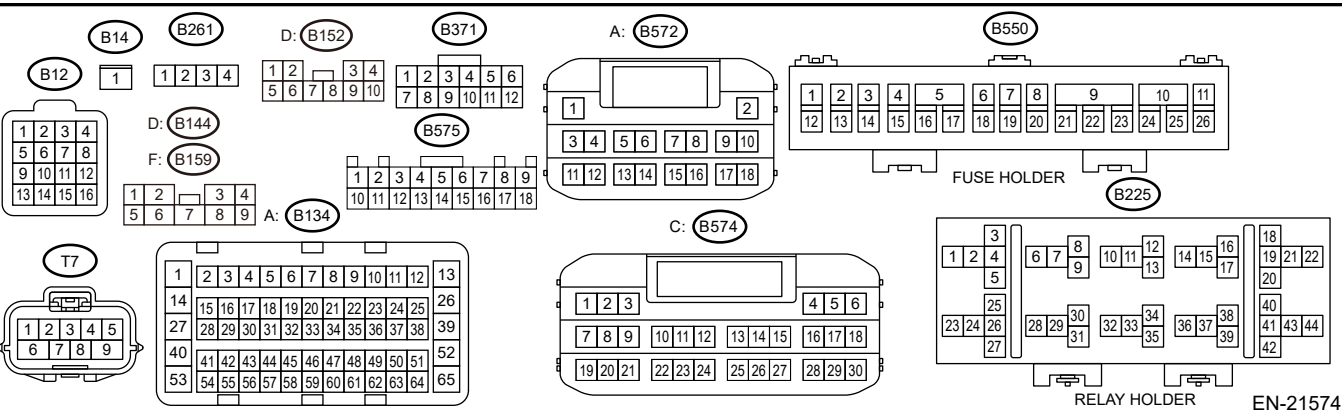
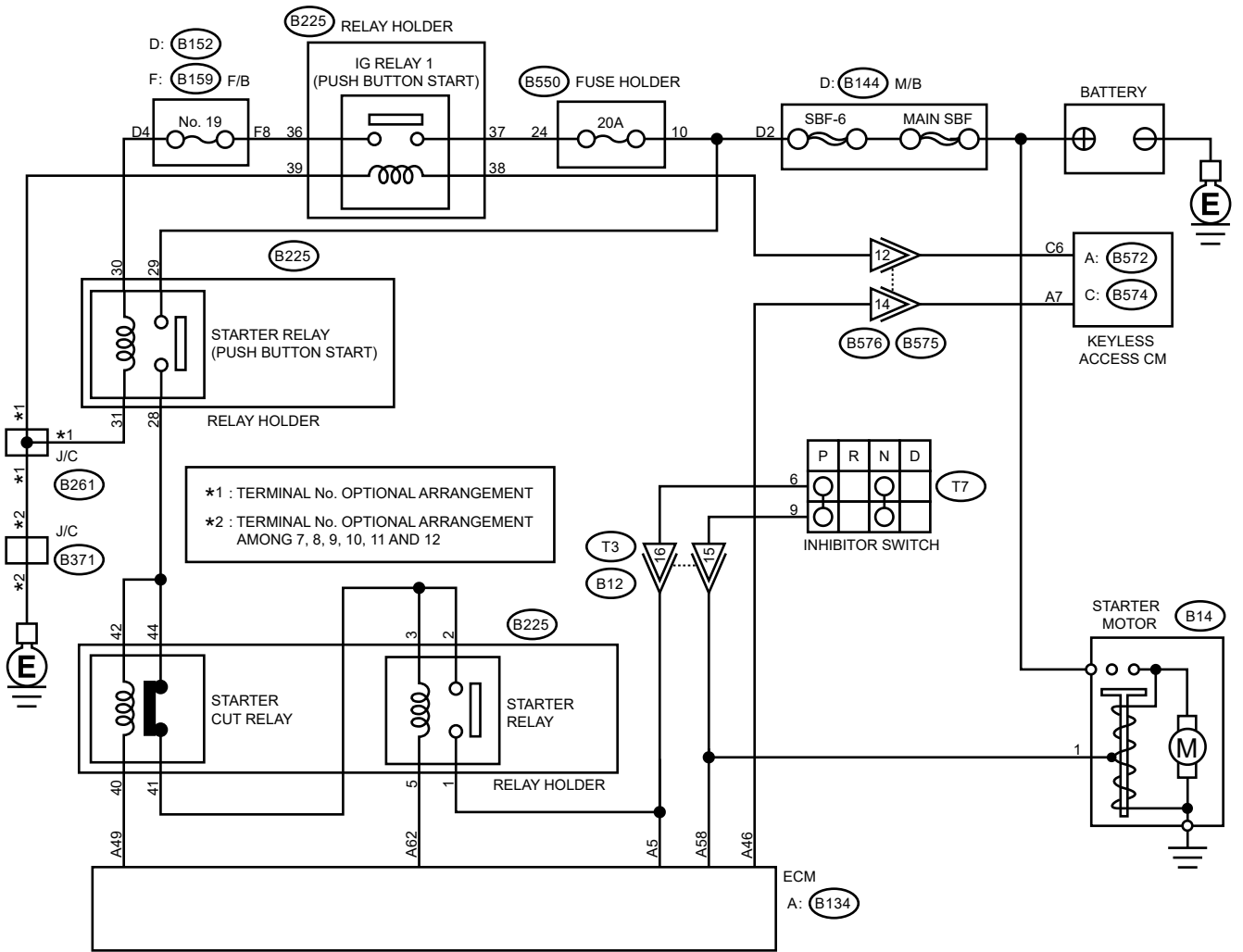
Caution:

- After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode. and Inspection Mode !\[\]\(2c367d84c99049f9805eec6142b5bc5d_img.jpg\) Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode..](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





1. CHECK PUSH BUTTON IGNITION SWITCH.


Operate the push button ignition switch.

Does it operate smoothly without catch?


Go to 2.

Yes

No


Replace the push button ignition switch.  [Ref. to SECURITY AND LOCKS>Push Button Ignition Switch.](#)

2. CHECK DTC.

1. Clear the memory using the Subaru Select Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Clear Memory Mode.](#)
2. Start and idle the engine for three minutes or more.

Is the same DTC as current diagnosis output?

Yes

 [Go to 3.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

3. CHECK HARNESS BETWEEN ECM AND KEYLESS ACCESS CM.

1. Turn the ignition to OFF.
2. Disconnect the connector from ECM.
3. Turn the ignition to ON.
4. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B134) No. 46 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power supply in harness between ECM connector and keyless access CM.

No

Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Detect abnormal continuity in the starter SW1.

Judge as ON NG when the starter SW 1 signal remains ON.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 8V$
Engine speed	≥ 500 rpm

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after starting the engine.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Starter SW 1 signal	\geq Battery voltage $\times 0.85 V$

Time needed for diagnosis: 30000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.


ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0560 SYSTEM VOLTAGE

DTC detecting condition:

Immediately at fault recognition

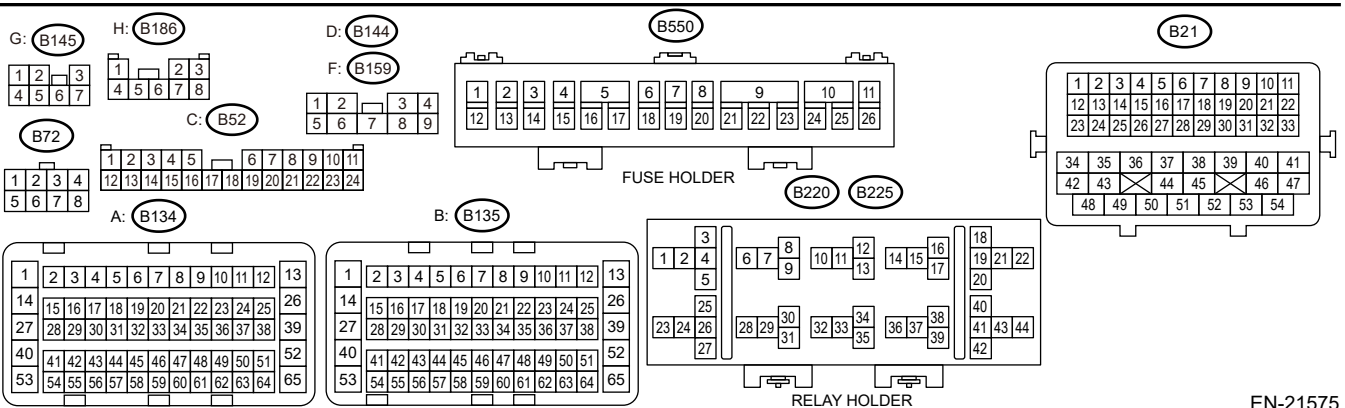
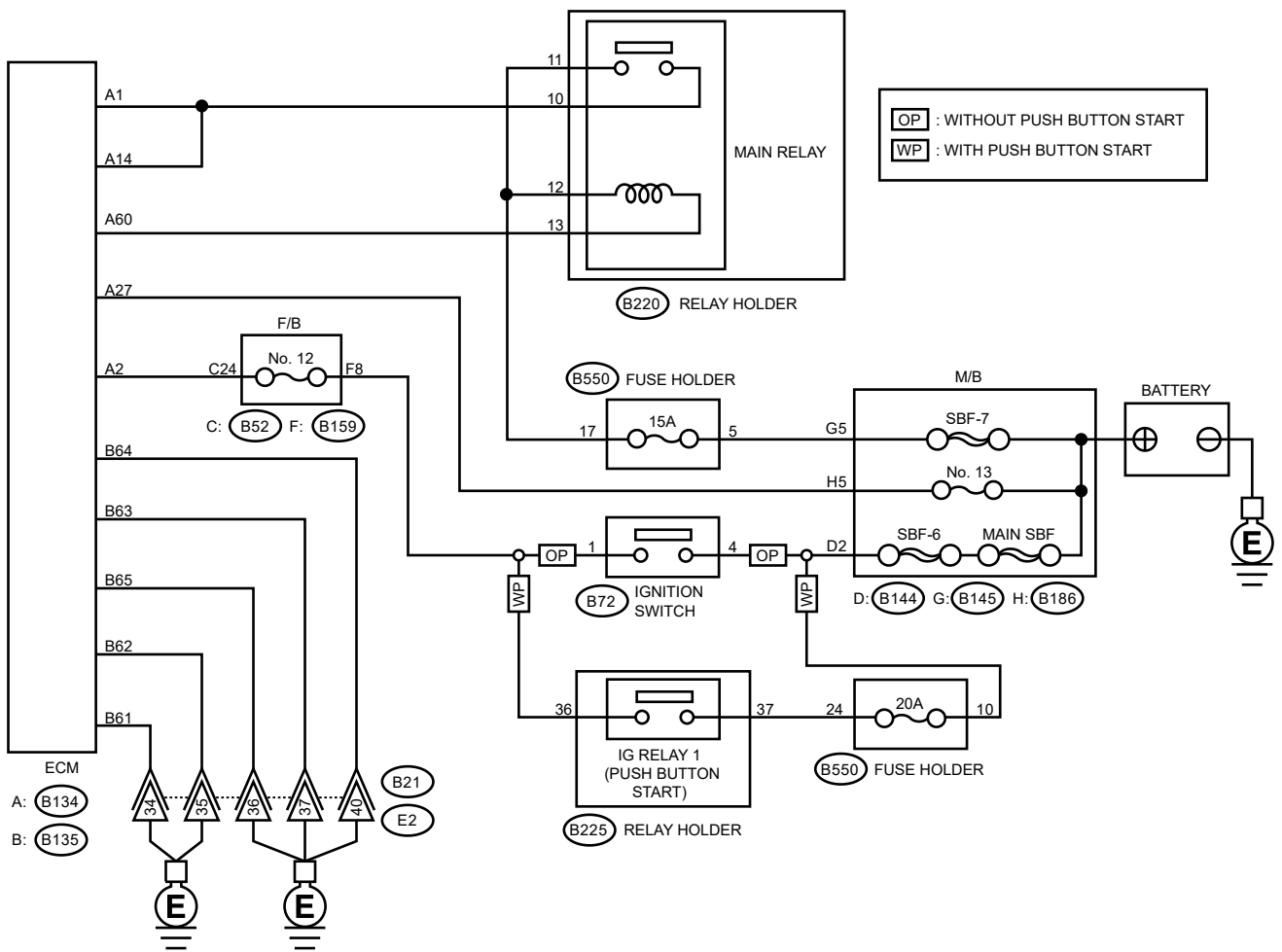
Caution:

- After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode. and Inspection Mode !\[\]\(f01c435bb39e3068a9b4895c9a993158_img.jpg\) \[Ref. to ENGINE \\(DIAGNOSTICS\\)\\(H4DO\\)>Inspection Mode.\]\(#\)](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





EN-21575

1. CHECK INPUT SIGNAL OF ECM.

1. Turn the ignition switch to OFF.
2. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B134) No. 27 (+) – Chassis ground (-):




Is the voltage 10 V or more?

Yes

Repair the poor contact of ECM connector.

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND MAIN FUSE BOX CONNECTOR.


1. Disconnect the connector from ECM.
2. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 27 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 3.](#)

No

Repair the short circuit to ground in harness between ECM connector and battery terminal.

3. CHECK FUSE NO. 13 (MAIN FUSE BOX).

Is the fuse blown out?

Yes

Replace the fuse.

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and battery**
- **Poor contact of ECM connector**
- **Poor contact of battery terminal**

1. OUTLINE OF DIAGNOSIS

Detect the open/short circuit of back-up power supply circuit.
Judge as NG when the backup power voltage is low.

2. EXECUTION CONDITION

Secondary Parameters	Execution
----------------------	-----------

	condition
Battery voltage	$\geq 10.9 \text{ V}$

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Voltage of back-up power supply	$\leq 3.5 \text{ V}$

Time needed for diagnosis: 2500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0562 SYSTEM VOLTAGE LOW



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

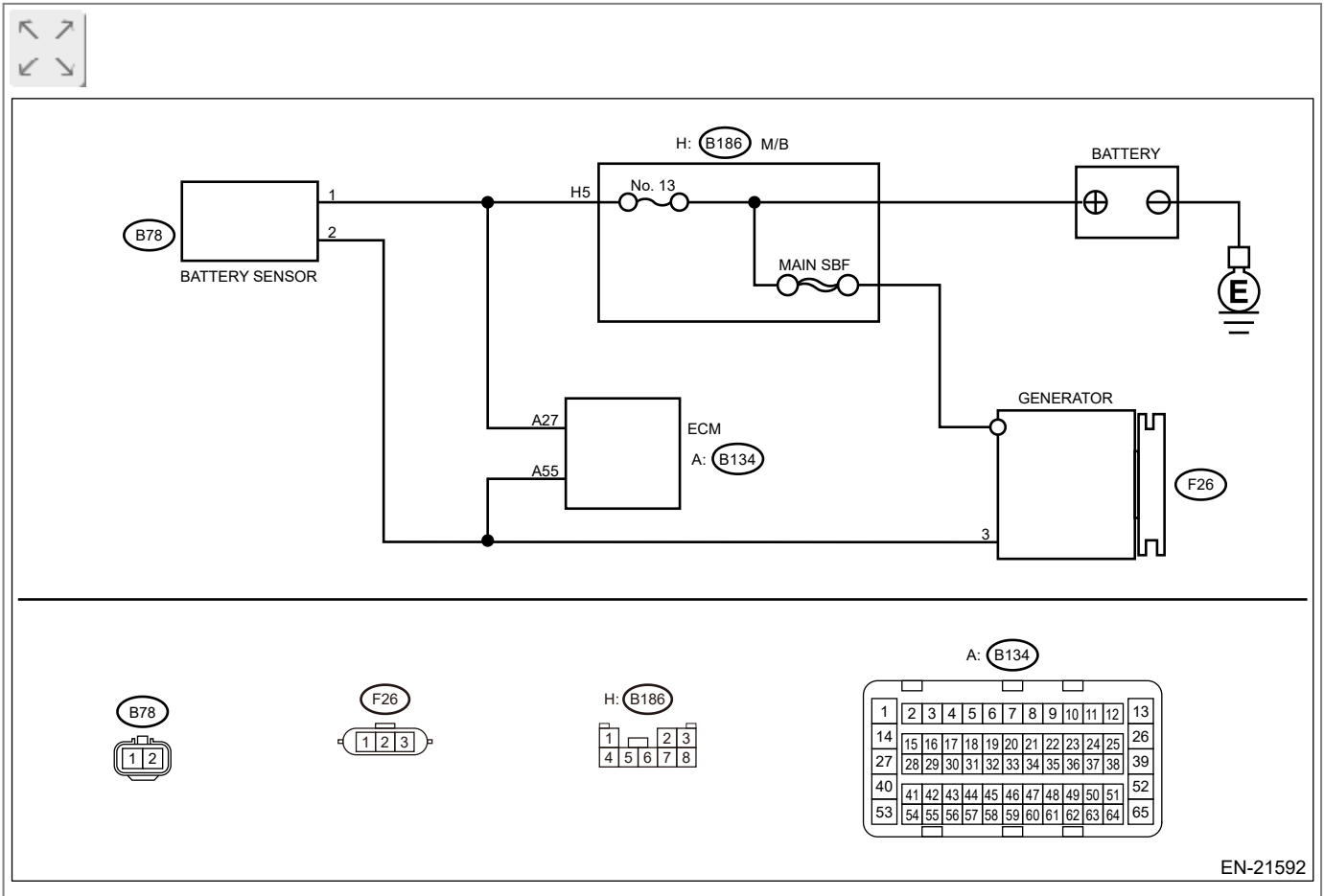
Charge warning light illuminates.

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and inspection  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



EN-21592

1. CHECK GENERATOR.


1. Start the engine.
2. Run the engine at idle after warming up.
3. Measure the voltage between generator terminal B and chassis ground.

Terminals


Generator terminal B (+) — Chassis ground (-):

Is the voltage 10.8 V or more?

Yes

 [Go to 2.](#)

No

Repair the generator.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Generator.](#)

2. CHECK GENERATOR.




1. Run the engine at 3,000 rpm.
2. Measure the voltage between generator terminal B and chassis ground.

Terminals


Generator terminal B (+) — Chassis ground (-):

Is the voltage 10.8 V or more?

Yes

 [Go to 3.](#)

No

Repair the generator.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Generator.](#)

3. CHECK BATTERY TERMINAL.



Turn the ignition switch to OFF.

Are the positive and negative battery terminals installed tightly?

Yes

 [Go to 4.](#)

No

Tighten the clamp of terminal.

4. CHECK INPUT VOLTAGE OF ECM.



1. Run the engine at idle.
2. Measure the voltage between ECM connector and chassis ground.


Connector & terminal

(B134) No. 1 (+) — Chassis ground (-):

(B134) No. 14 (+) — Chassis ground (—):

Is the voltage 10.8 V or more?

Yes

 [Go to 5.](#)

No

Repair the harness connector between ECM connector, battery and main relay.

5. CHECK POOR CONTACT OF CONNECTORS.

Is there poor contact of connectors between ECM, generator or battery?




Yes

Repair the connector.

No


 [Go to 6.](#)

6. CHECK ECM.

1. Connect all connectors.
2. Clear the memory.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)
3. Perform the Inspection Mode.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
4. Read the DTC.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC as current diagnosis still output?

Yes

Replace the generator.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Generator.](#)


No

 [Go to 7.](#)

7. CHECK DTC DISPLAY.

Are other DTCs output?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the generator output terminal.
Judge as NG if the battery voltage is out of specification.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Engine speed	$\geq 1500\text{rpm}$

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Battery voltage	$< 10.8\text{V}$

Time needed for diagnosis: 30000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0563 SYSTEM VOLTAGE HIGH



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

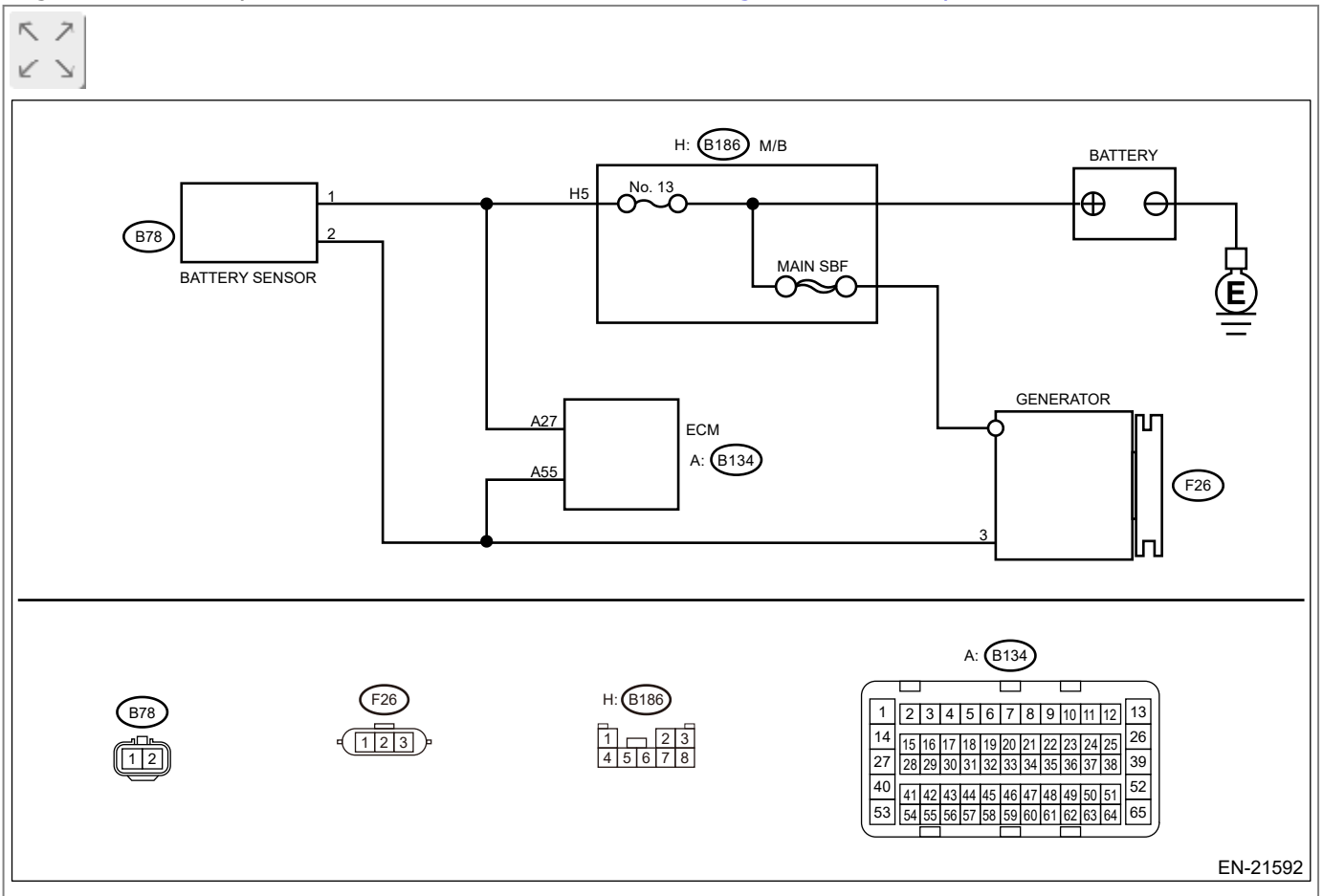
Charge warning light illuminates.

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK GENERATOR.


1. Start the engine.
2. Run the engine at idle after warming up.
3. Measure the voltage between generator terminal B and chassis ground.

Terminals


Generator terminal B (+) — Chassis ground (-):

Is the voltage less than 16.2 V?

Yes

 [Go to 2.](#)

No

Repair the generator.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Generator.](#)

2. CHECK GENERATOR.




1. Run the engine at 3,000 rpm.
2. Measure the voltage between generator terminal B and chassis ground.

Terminals


Generator terminal B (+) — Chassis ground (-):

Is the voltage less than 16.2 V?

Yes

 [Go to 3.](#)

No

Repair the generator.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Generator.](#)

3. CHECK BATTERY TERMINAL.



Turn the ignition switch to OFF.

Are the positive and negative battery terminals installed tightly?

Yes

 [Go to 4.](#)

No

Tighten the clamp of terminal.

4. CHECK INPUT VOLTAGE OF ECM.



1. Run the engine at idle.
2. Measure the voltage between ECM connector and chassis ground.


Connector & terminal

(B134) No. 1 (+) — Chassis ground (-):

(B134) No. 14 (+) — Chassis ground (—):

Is the voltage less than 16.2 V?

Yes

 [Go to 5.](#)

No

Repair the harness connector between the ECM, battery and main relay.

5. CHECK POOR CONTACT OF CONNECTORS.

Is there poor contact of connectors between ECM, generator or battery?




Yes

Repair the connector.

No


 [Go to 6.](#)

6. CHECK ECM.


1. Connect all connectors.
2. Clear the memory.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)
3. Perform the Inspection Mode.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
4. Read the DTC.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC as current diagnosis still output?

Yes

Replace the generator.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Generator.](#)


No

 [Go to 7.](#)

7. CHECK DTC DISPLAY.

Are other DTCs output?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the generator output terminal.
Judge as NG if the battery voltage is out of specification.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Engine speed	$\geq 1500\text{rpm}$

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Battery voltage	$\geq 16.2\text{V}$

Time needed for diagnosis: 30000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Engine does not start.
- Engine stalls.


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE.

1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of microcomputer (RAM).

When there is a problem in the CPU normal RAM, judge as NG.

If it is possible to write data to the whole area of RAM in the initial routine, and is possible to read the same data, it is judged as OK, and if not, NG.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
ECM initialization	Execution

Diagnosis with the initial routine.

3. GENERAL DRIVING CYCLE

Perform the diagnosis as soon as the ignition switch is turned to ON.

4. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Write the specified value into the RAM.	Different from written value

Time needed for diagnosis: 512 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0605 INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR

Note:

For the diagnostic procedure, refer to DTC P0606.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0606 CONTROL MODULE PROCESSOR.](#)

1. OUTLINE OF DIAGNOSIS

Judge as NG when SUM value of ROM is outside the standard value.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
ECM initialization	Execution

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

Judge as NG if the criteria below are met.

Judgment value

Malfunction Criteria	Threshold Value
SUM value of ROM	Malfunction

Time needed for diagnosis: 512 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0606 CONTROL MODULE PROCESSOR



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

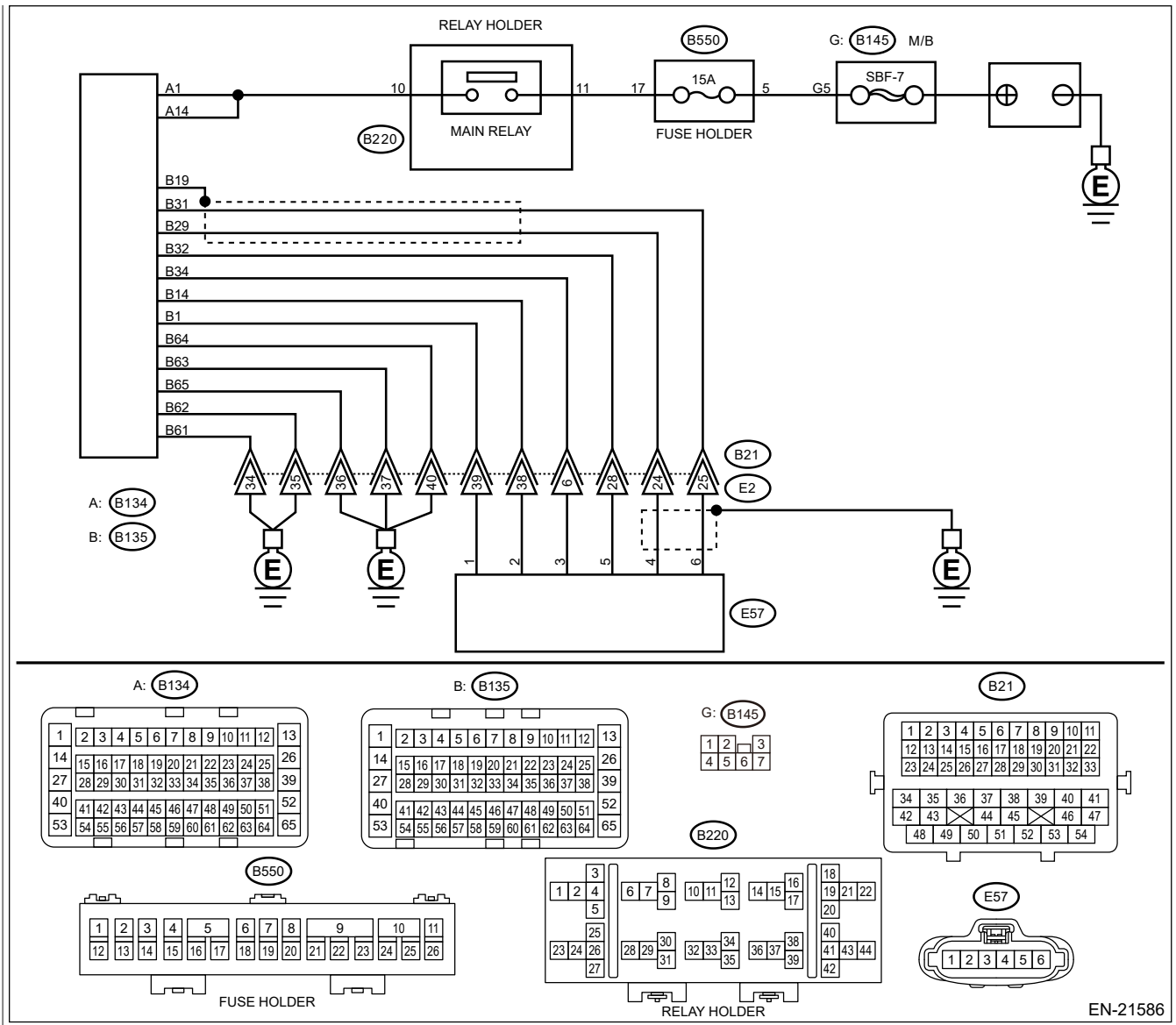
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21586

1. CHECK INPUT VOLTAGE OF ECM.



1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B134) No. 1 (+) – Chassis ground (-):

(B134) No. 14 (+) – Chassis ground (-):

Is the voltage 10 – 13 V?

Yes

[Go to 2.](#)

No

Repair the open or short to ground in the power supply circuit.

2. CHECK INPUT VOLTAGE OF ECM.



1. Start the engine.
2. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

- (B134) No. 1 (+) — Chassis ground (-):
- (B134) No. 14 (+) — Chassis ground (-):

Is the voltage 13 — 15 V?

Yes

 [Go to 3.](#)

No

Repair the open or short to ground in the power supply circuit.

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connectors from electronic throttle control.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and electronic throttle control connector.

Connector & terminal

- (B135) No. 4 — (E57) No. 5:
- (B135) No. 34 — (E57) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and electronic throttle control connector**
- **Poor contact of coupling connector**

4. CHECK ECM GROUND HARNESS.



1. Connect all connectors.
2. Turn the ignition to ON.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B135) No. 61 (+) — Chassis ground (-):

(B135) No. 62 (+) — Chassis ground (-):

(B135) No. 63 (+) — Chassis ground (-):


(B135) No. 64 (+) — Chassis ground (-):

(B135) No. 65 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes

Check the connector for poor contact and check the harness.

Replace the ECM if no fault is found.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

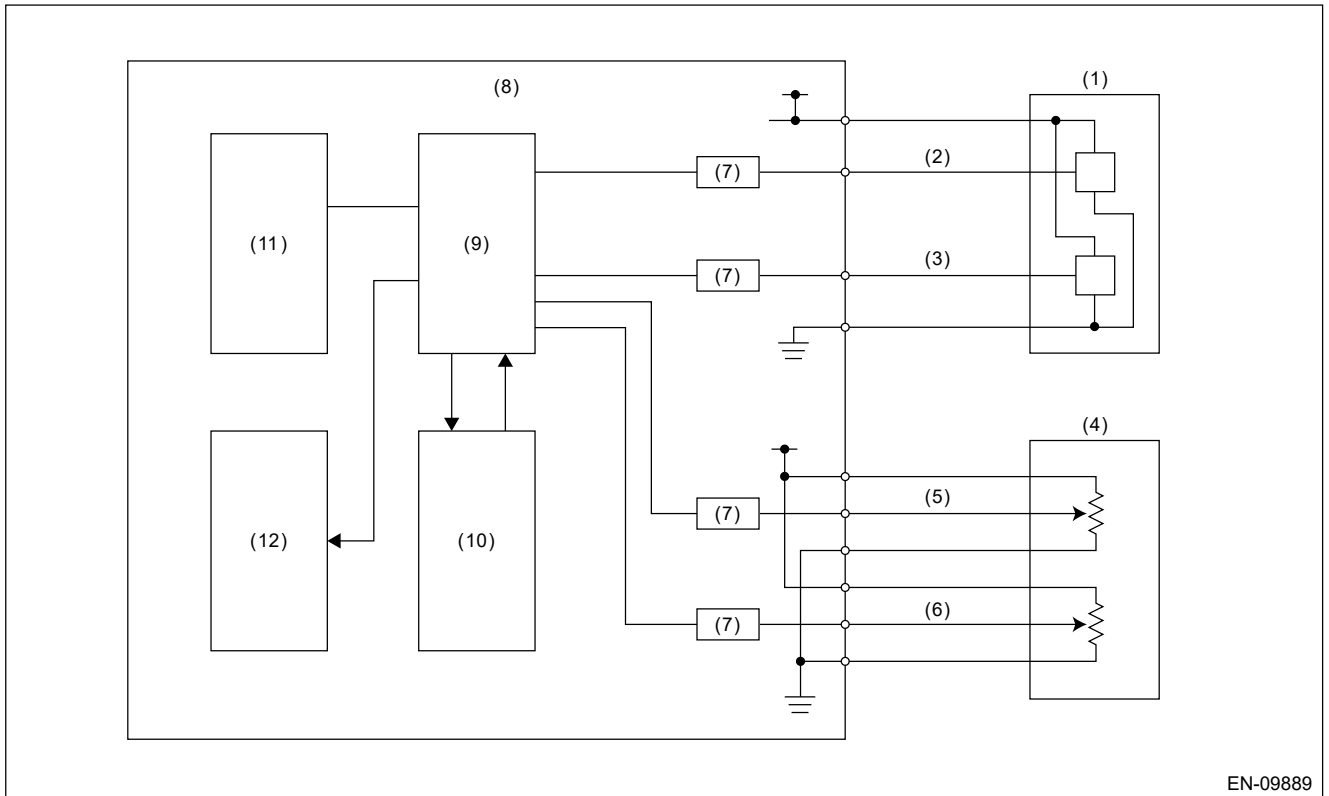
- **Open circuit in ground circuit**
- **Loose engine ground terminal**
- **Poor contact of coupling connector**

1. OUTLINE OF DIAGNOSIS

Judge as NG when the CPU operation is abnormal.

- (1) Instruction check
- (2) Software flow check
- (3) Software monitor check
- (4) If the output IC operation is abnormal
- (5) CAN register check

2. COMPONENT DESCRIPTION



EN-09889

- | | | |
|---------------------------------------|---|--------------------|
| (1) Throttle position sensor | (5) Accelerator pedal position sensor 1 | (9) CPU |
| (2) Throttle position sensor 1 | (6) Accelerator pedal position sensor 2 | (10) Monitoring IC |
| (3) Throttle position sensor 2 | (7) I/F circuit | (11) EEPROM |
| (4) Accelerator pedal position sensor | (8) Engine control module (ECM) | (12) Output IC |

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
(1) — 1 Initial routine	
(1) — 2 Ignition switch	ON
(1) — 2 Battery voltage	$\geq 6.2V$
(1) — 2 Electronic throttle control relay	ON
(2) Ignition switch	ON
(3) Ignition switch	ON
(3) Battery voltage	$\geq 6.2V$
(3) Electronic throttle control relay	ON
(4) Ignition switch	ON
(5) Initial routine	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
(1) — 1 Instruction value	Different from expected value
(1) — 2 Calculated result from CPU and FPU	Different from expected value
(2) Process flow result	The result and expected value do not match.
(3) High integrated IC motor continuity cut demand	ON
(4) Communication between output driver ICs	Communication failure
(5) Writing value to CAN register	≠ Read out value

Time needed for diagnosis:

(1) — 1: 2

(1) — 2: 512ms

(2): 504ms

(3): 48ms

(4): 2500ms

(5): Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P060A INTERNAL CONTROL MODULE MONITORING PROCESSOR PERFORMANCE

Note:

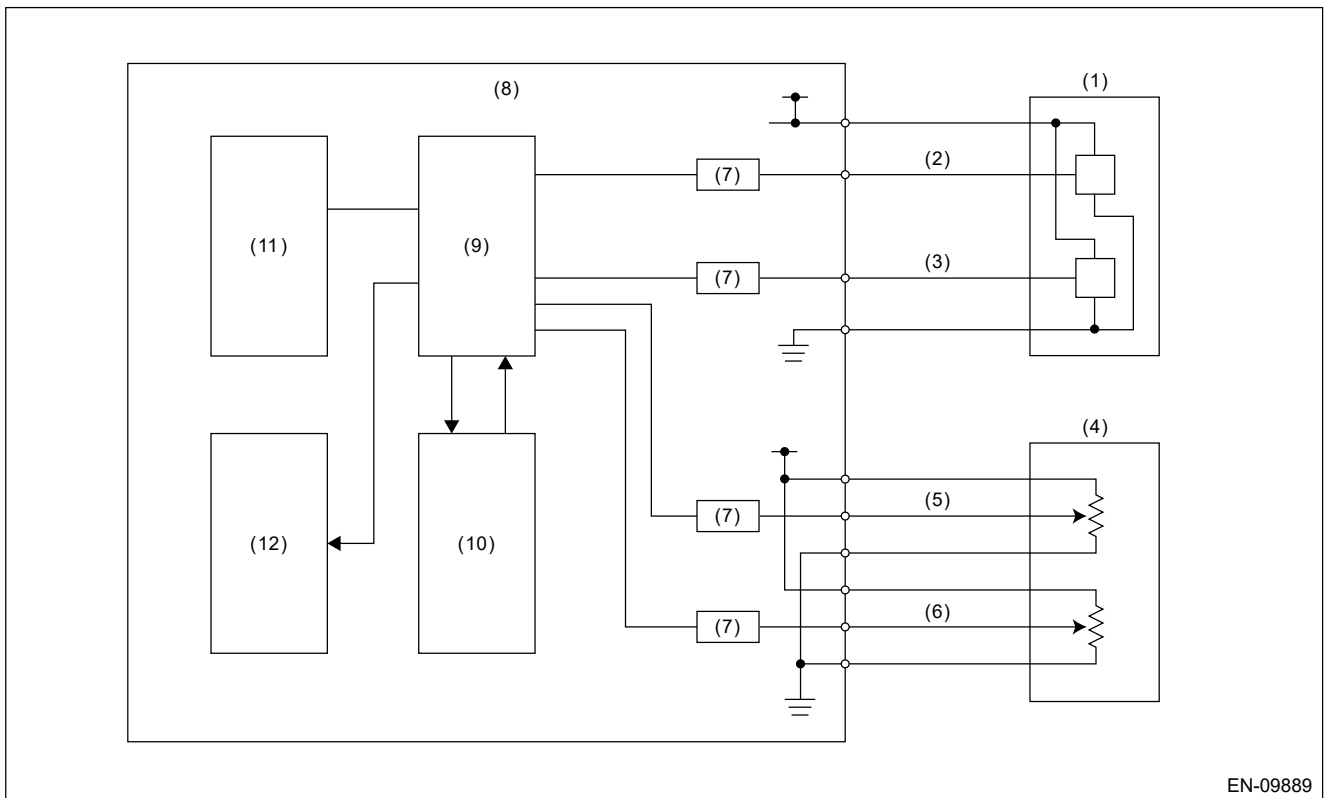
For the diagnostic procedure, refer to DTC P0606.  Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0606 CONTROL MODULE PROCESSOR.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the monitoring IC operation is abnormal.

- (1) Monitoring IC Disable (motor continuity cut demand) diagnosis
- (2) Monitoring IC function diagnosis
- (3) Monitoring IC register diagnosis

2. COMPONENT DESCRIPTION



EN-09889

- | | | |
|---------------------------------------|---|--------------------|
| (1) Throttle position sensor | (5) Accelerator pedal position sensor 1 | (9) CPU |
| (2) Throttle position sensor 1 | (6) Accelerator pedal position sensor 2 | (10) Monitoring IC |
| (3) Throttle position sensor 2 | (7) I/F circuit | (11) EEPROM |
| (4) Accelerator pedal position sensor | (8) Engine control module (ECM) | (12) Output IC |

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
(1) Battery voltage (1) When CPU intentionally sends motor continuity cut demand	$\geq 6V$
(2) Battery voltage (2) CPU intentionally sends incorrect data	$\geq 6V$
(3) Battery voltage	$\geq 6V$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when one of the following conditions is established.

Judgment value

Malfunction Criteria	Threshold Value
(1) Main throttle opening angle – Main throttle opening angle at monitoring start	$\geq 2^\circ$
(2) Monitoring IC motor continuity cut demand	Not detected
(3) Monitoring IC register writing value	\neq Reading value

Time needed for diagnosis:

(1): 24ms

(2): 2984 ms

(3): 200ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P060B INTERNAL CONTROL MODULE A/D PROCESSING PERFORMANCE

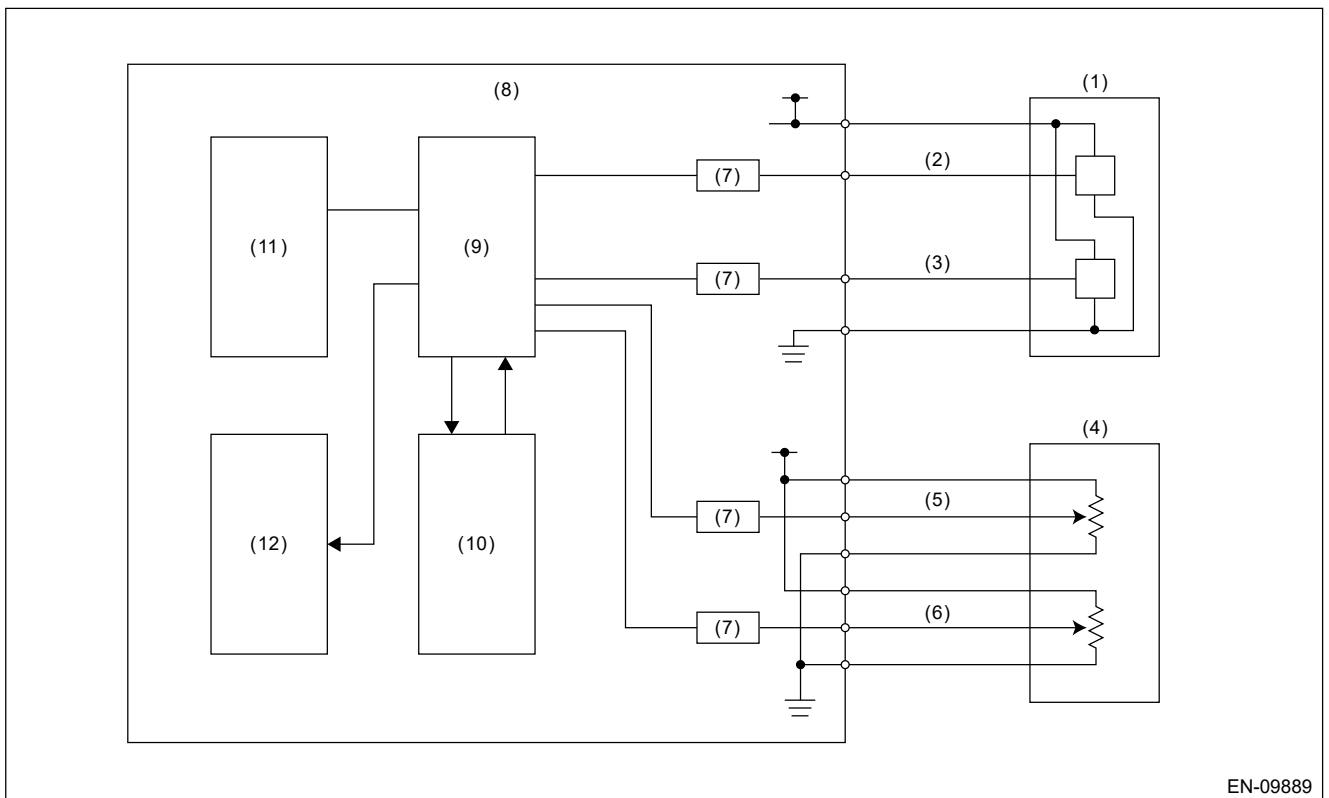
Note:

For the diagnostic procedure, refer to DTC P0606.  Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0606 CONTROL MODULE PROCESSOR.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the AD converter operation is abnormal.

2. COMPONENT DESCRIPTION



EN-09889

- (1) Throttle position sensor
- (2) Throttle position sensor 1
- (3) Throttle position sensor 2
- (4) Accelerator pedal position sensor
- (5) Accelerator pedal position sensor 1
- (6) Accelerator pedal position sensor 2
- (7) I/F circuit
- (8) Engine control module (ECM)
- (9) CPU
- (10) Monitoring IC sensor 2
- (11) EEPROM
- (12) Output IC

3. EXECUTION CONDITION

Secondary Parameters	Execution condition

(1) Battery voltage	$\geq 6V$
(1) Target voltage	$= 0 V$
(2) Battery voltage	$\geq 6V$
(2) Target voltage	$= 5 V$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when one of the following conditions is established.

Judgment value

Malfunction Criteria	Threshold Value
(1) Actual voltage	$> 0.01953125V$
(2) Actual voltage	$< 4.979248047V$

Time needed for diagnosis: 200ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC P0616 STARTER RELAY "A" CIRCUIT LOW

1. MODEL WITHOUT PUSH BUTTON START

DTC detecting condition:

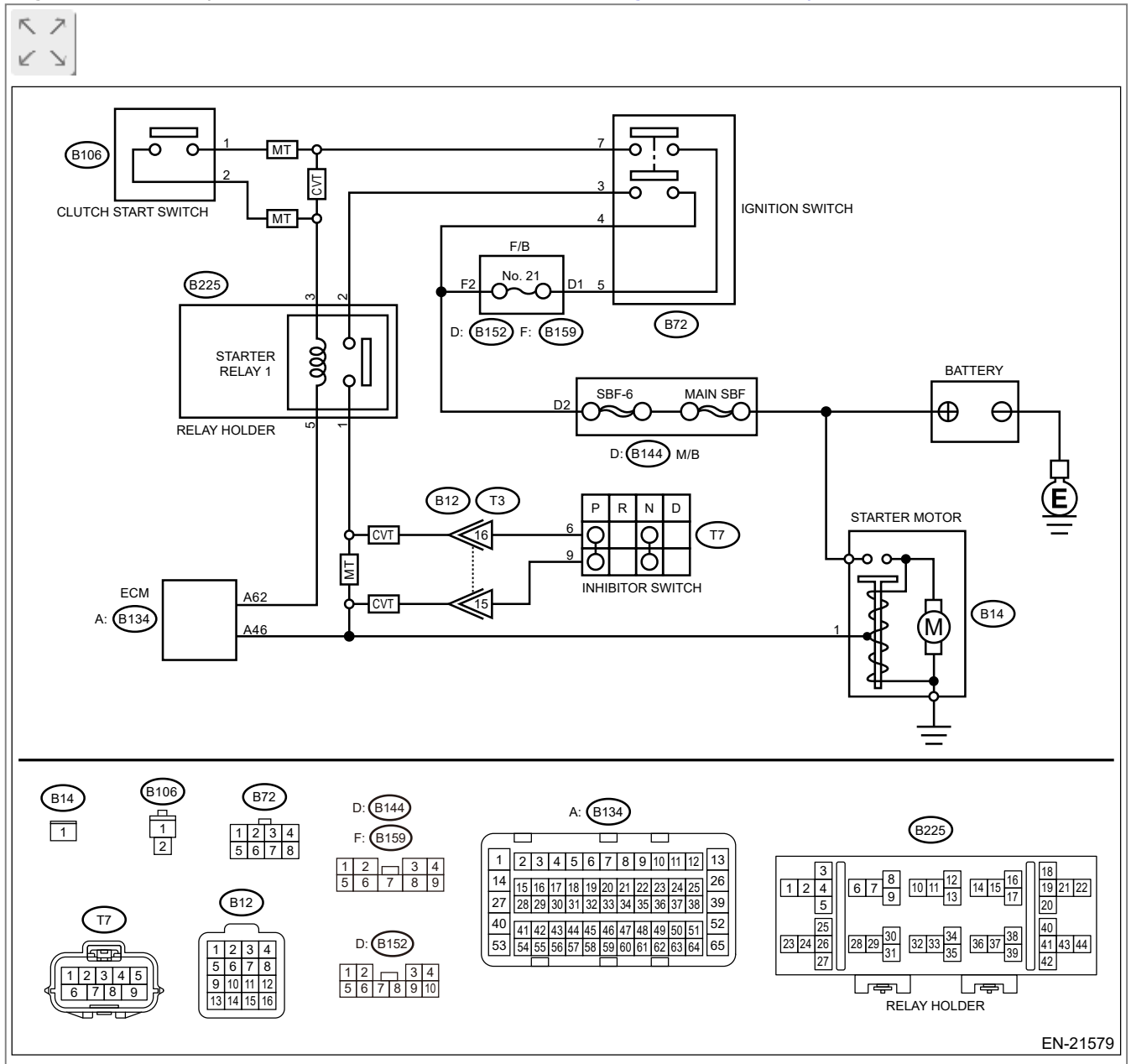
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check DTC using "List of Diagnostic Trouble Code (DTC)". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4D0\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND STARTER RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Remove the starter relay.
3. Disconnect the connector from starter motor.
4. Disconnect the connector from ECM.
5. Measure the resistance of harness between ECM connector and starter relay connector.

Connector & terminal

(B134) No. 46 — (B225) No. 1:

Note:

For CVT model, place the select lever in "P" range or "N" range.

Is the resistance less than 1 Ω ?

Yes

[Go to 3.](#)

No

Note:

Check the following item and repair or replace if necessary.

- **Open circuit of harness between ECM connector and starter relay connector**
- **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND STARTER RELAY CONNECTOR.

Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 46 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

Repair the poor contact of ECM connector.

No

Repair the short circuit to ground in harness between ECM connector and starter relay connector.


2. MODEL WITH PUSH BUTTON START

Immediately at fault recognition


Trouble symptom:

Failure of engine to start

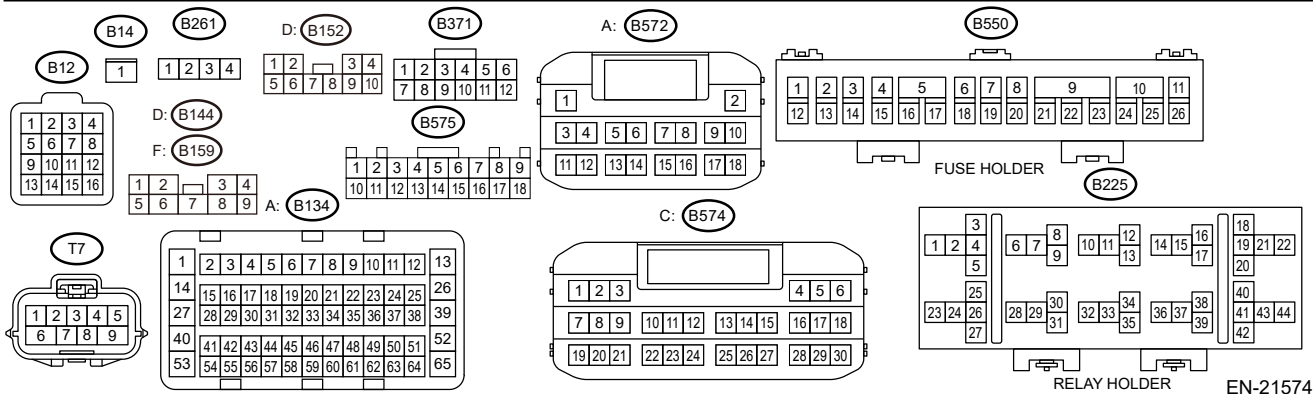
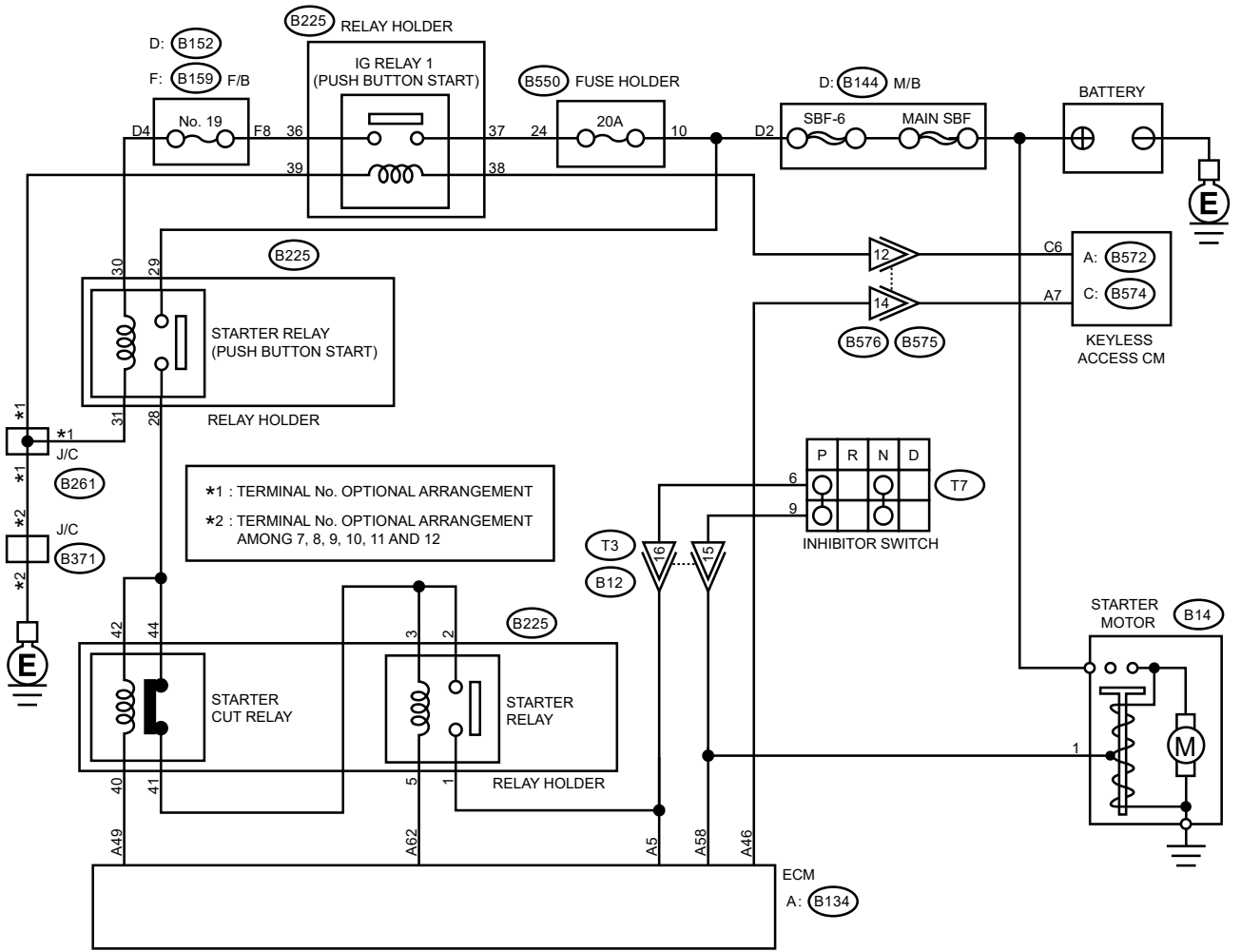
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode. and Inspection Mode !\[\]\(2c367d84c99049f9805eec6142b5bc5d_img.jpg\) \[Ref. to ENGINE \\(DIAGNOSTICS\\)\\(H4DO\\)>Inspection Mode.\]\(#\)](#)**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System NON-TURBO MODEL (WITH PUSH BUTTON START)  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM > NON-TURBO MODEL \(WITH PUSH BUTTON START\).](#)





1. CHECK HARNESS BETWEEN ECM AND STARTER RELAY CONNECTOR.

1. Turn the ignition to OFF.
2. Disconnect the connector from ECM.
3. Remove the starter relay.
4. Measure the resistance of harness between ECM connector and starter relay connector.

Note:

Place the select lever in "P" range or "N" range.

Connector & terminal

(B134) No. 5 — (B225) No. 1:

Is the resistance less than 1 Ω?

Yes

 [Go to 2.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and starter relay connector**
- **Poor contact of coupling connector**

2. CHECK HARNESS BETWEEN ECM AND STARTER RELAY CONNECTOR.



1. Disconnect the connector from starter motor.
2. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 5 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

Repair the poor contact of ECM connector.

No

Repair the short circuit to ground in harness between ECM connector and starter relay connector.

3. OUTLINE OF DIAGNOSIS

- Model without push button start
Detect abnormal continuity in the starter SW1.
Judge as OFF NG when the starter SW 1 signal remains OFF.
- Model with push button start
Detect abnormal continuity in the starter SW 2.
Judge as OFF NG when the starter SW 2 signal remains OFF.

4. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 8V
Engine speed	Changes from 0 rpm to 500 rpm

Vehicle speed	or more < 1km/h (0.6MPH)
Starter relay drive	ON

5. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

6. DIAGNOSTIC METHOD

Judge as OFF NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Starter SW 1 signal (model without push button start)	< Battery voltage × 0.85
Starter SW 2 signal (model with push button start)	

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC P0617 STARTER RELAY "A" CIRCUIT HIGH

1. MODEL WITHOUT PUSH BUTTON START



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

Failure of engine to start

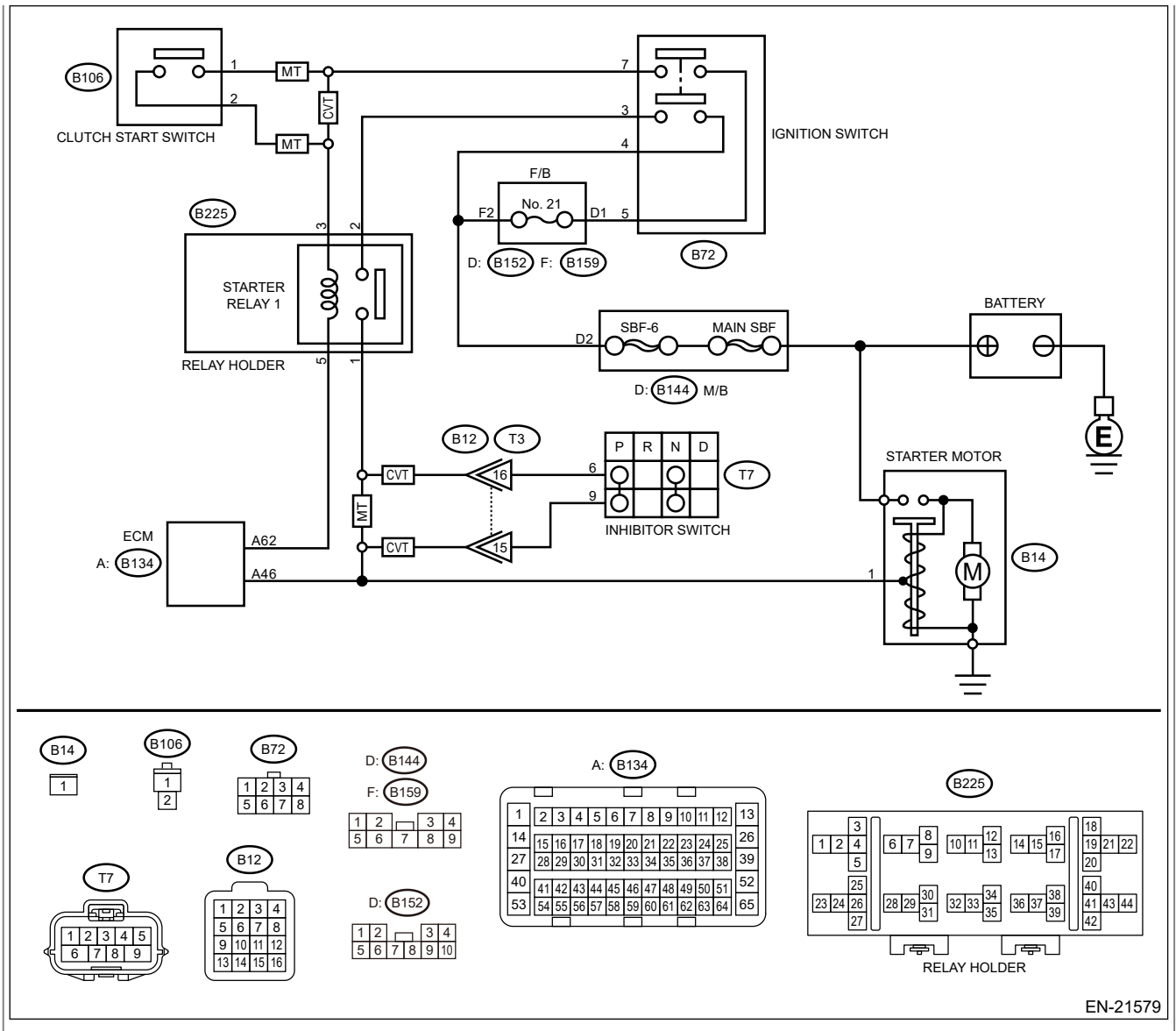
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21579

1. CHECK FOR ANY OTHER DTC ON DISPLAY.



Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".
[Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND STARTER RELAY CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Turn the ignition switch to ON.
4. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B134) No. 46 (+) — Chassis ground (–):

Note:

For CVT model, place the select lever in "P" range or "N" range.

Is the voltage 10 V or more?

Yes

Repair the short circuit to power in harness between ECM connector and starter relay connector.

No

Repair the poor contact of ECM connector.

2. MODEL WITH PUSH BUTTON START



DTC detecting condition:

Immediately at fault recognition


Trouble symptom:

Failure of engine to start

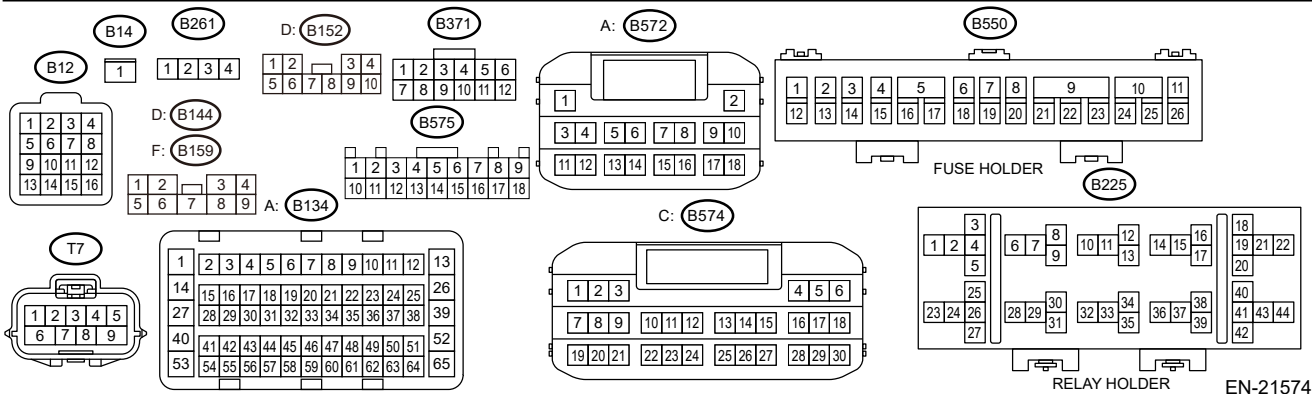
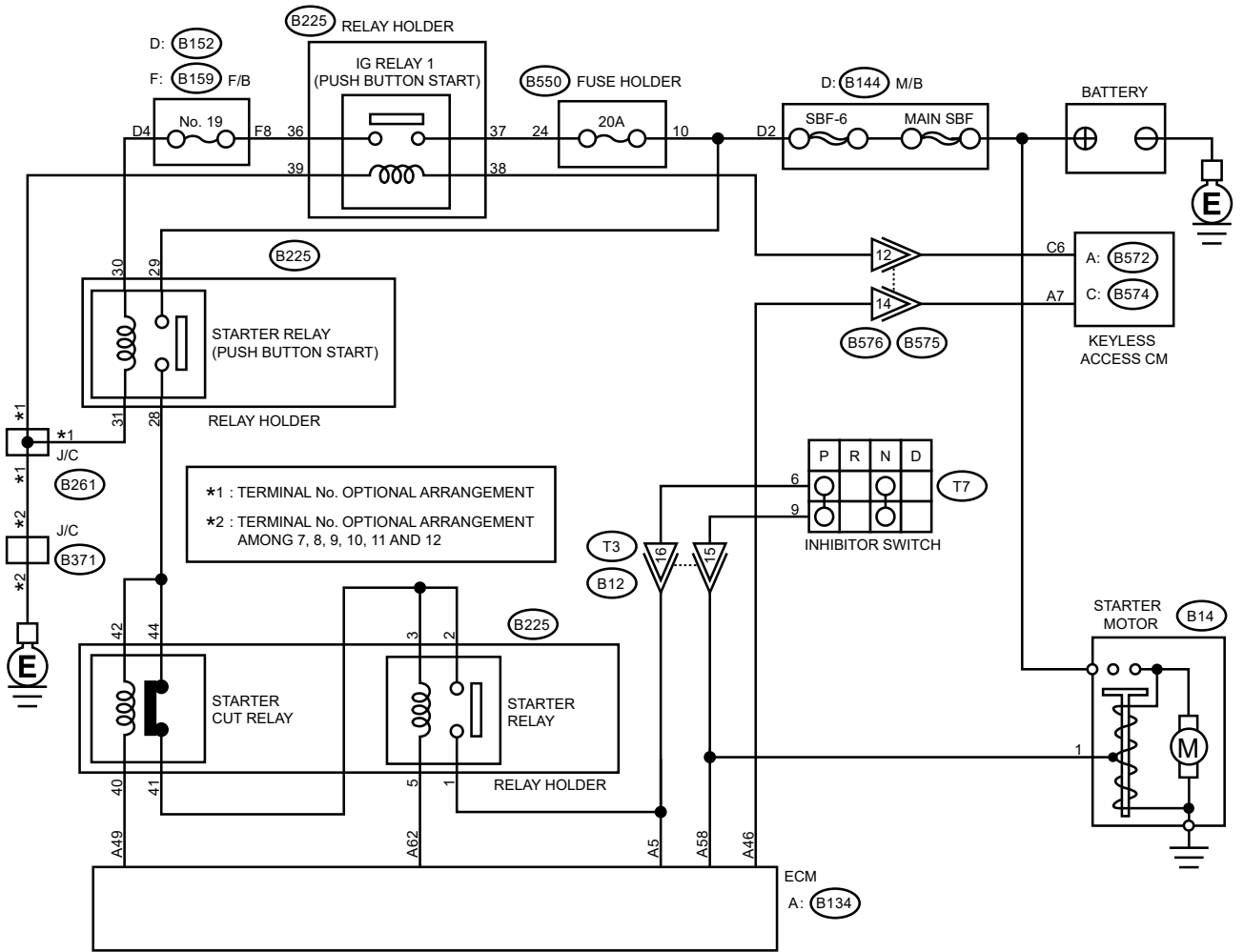
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory**  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode. and Inspection Mode](#)  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System NON-TURBO MODEL (WITH PUSH BUTTON START)  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM > NON-TURBO MODEL \(WITH PUSH BUTTON START\).](#)





1. CHECK STARTER MOTOR.

1. Turn the ignition to ON.
2. Check the starter motor condition.

Is the starter motor rotating?

Yes

[Go to 2.](#)



No

Repair the short circuit to power supply in harness.

Note:

In this case, repair the following harnesses:

- **Short circuit to power supply in harness between ECM connector and starter relay connector**
- **Short circuit to power supply in harness between ECM connector and starter motor**
- **Short circuit to power supply in harness between starter relay connector and starter motor**

2. CHECK HARNESS BETWEEN STARTER CUT RELAY CONNECTOR AND STARTER RELAY CONNECTOR.



1. Turn the ignition to OFF.
2. Disconnect the connector from starter motor.
3. Remove the inhibitor relay.
4. Remove the starter relay.
5. Remove the starter cut relay.
6. Turn the ignition to ON.
7. Measure the voltage between starter relay connector and chassis ground.

Connector & terminal

(B225) No. 3 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power supply in harness between starter cut relay connector and starter relay connector.

No

 [Go to 3.](#)

3. CHECK STARTER CUT RELAY.



1. Connect the battery to starter cut relay terminals No. 40 and No. 42.
2. Measure the resistance between starter cut relay terminals.

Terminals


No. 41 —No. 44:

Is the resistance 1 MΩ or more?

Yes

 [Go to 6.](#)

No

Replace the starter cut relay.  [Ref. to SECURITY AND LOCKS>Starter Cut Relay.](#)

 [Go to 4.](#)

4. CHECK HARNESS BETWEEN ECM AND STARTER RELAY CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 62 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM connector and starter relay connector.

5. CHECK STARTER RELAY.

Measure the resistance between starter relay terminals.

Terminals

No. 1 —No. 2:

Is the resistance 1 M Ω or more?

Yes

 [Go to 6.](#)

No

Replace the starter relay.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Electrical Component Location>LOCATION.](#)

6. CHECK HARNESS BETWEEN ECM, STARTER RELAY CONNECTOR AND STARTER MOTOR.

1. Disconnect the connector from ECM.
2. Turn the ignition to ON.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B134) No. 5 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power supply in harness.

Note:

In this case, repair the following harnesses:

- **Short circuit to power supply in harness between ECM connector and starter relay connector**
- **Short circuit to power supply in harness between ECM connector and starter motor**
- **Short circuit to power supply in harness between starter relay connector and starter motor**

No

Repair the poor contact of ECM connector.

3. OUTLINE OF DIAGNOSIS

- Model without push button start
Detect abnormal continuity in the starter SW1.
Judge as ON NG when the starter SW 1 signal remains ON.
- Model with push button start
Detect abnormal continuity in the starter SW 2.
Judge as ON NG when the starter SW 2 signal remains ON.

4. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 8V
Engine speed	≥ 500 rpm
Starter relay drive	OFF

5. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

6. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Starter SW 1 signal (model without push button start)	≥ Battery voltage × 0.85 V
Starter SW 2 signal (model with push button start)	

Time needed for diagnosis: 30000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P062F INTERNAL CONTROL MODULE EEPROM ERROR

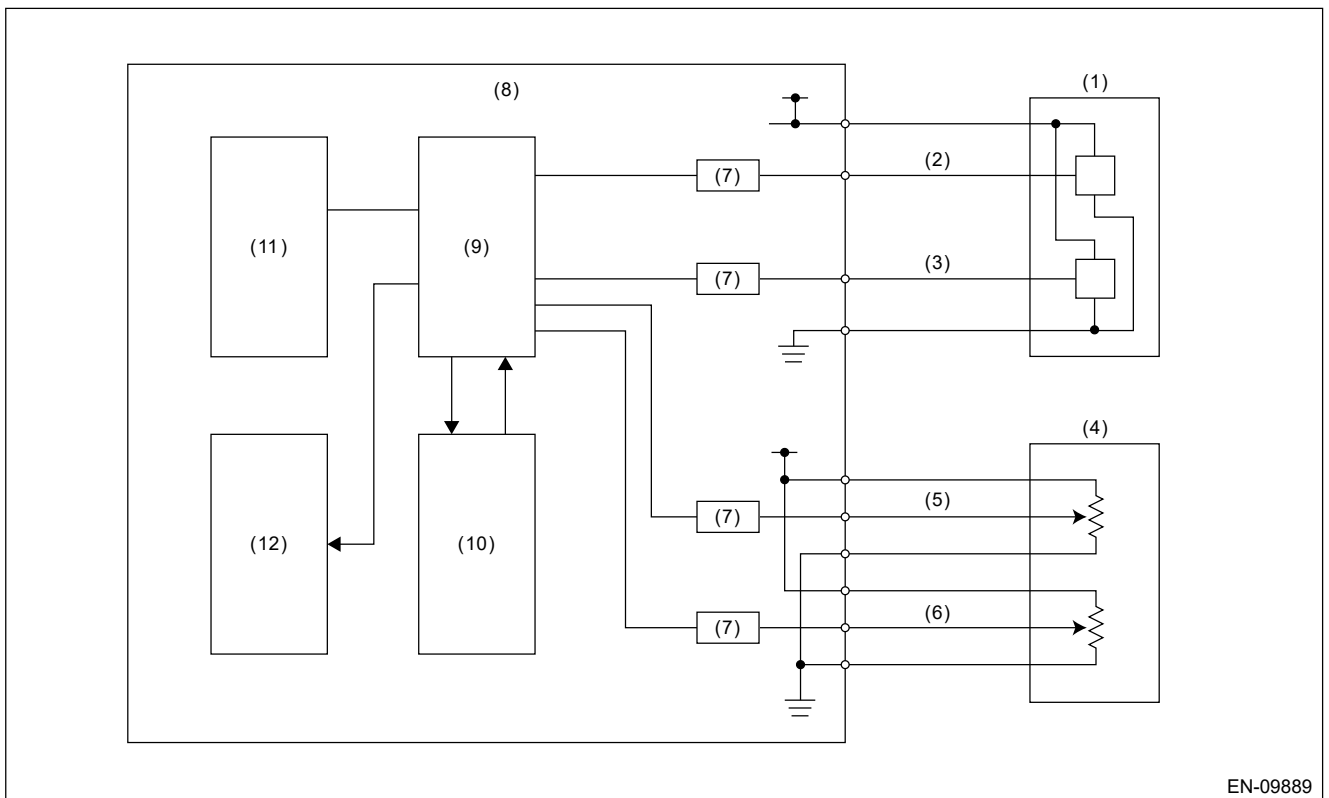
Note:

For the diagnostic procedure, refer to DTC P0606.  Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0606 CONTROL MODULE PROCESSOR.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the EEPROM operation is abnormal.

2. COMPONENT DESCRIPTION



EN-09889

- (1) Throttle position sensor
- (2) Throttle position sensor 1
- (3) Throttle position sensor 2
- (4) Accelerator pedal position sensor
- (5) Accelerator pedal position sensor 1
- (6) Accelerator pedal position sensor 2
- (7) I/F circuit
- (8) Engine control module (ECM)
- (9) CPU
- (10) Monitoring IC sensor 2
- (11) EEPROM
- (12) Output IC

3. EXECUTION CONDITION

Secondary Parameters	Execution condition

None	
------	--

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Writing result to EEPROM	Malfunction

Time needed for diagnosis: 2 times

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P065A GENERATOR/ALTERNATOR SYSTEM PERFORMANCE



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

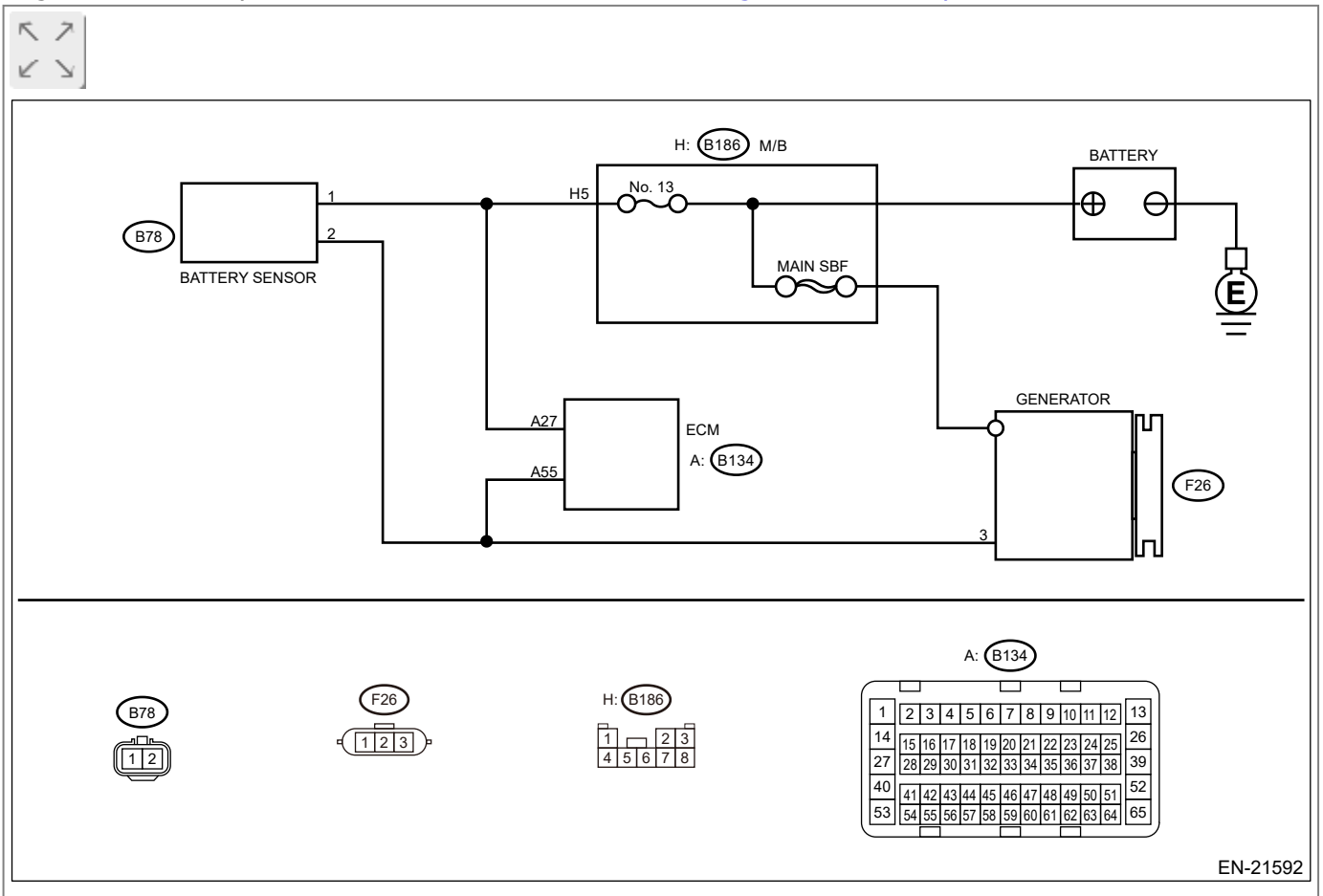
Charge warning light illuminates.

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System.



1. CHECK AUXILIARY BELT.

Is the auxiliary belt free from any breakage?


Yes

Replace the generator.  Ref. to STARTING/CHARGING



[SYSTEMS\(H4DO\)>Generator.](#)

No

Replace the auxiliary belt.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Generator.](#)

1. OUTLINE OF DIAGNOSIS

Judge as NG when detecting no rotation of the generator (mechanical malfunction such as belt breakage), or internal electrical malfunction.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
LIN communication schedule in progress (mechanical malfunction warning)	= \$01
LIN communication schedule in progress (electrical malfunction warning)	= \$01

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Secondary Parameters	Execution condition
Internal malfunction flag of generator (high temperature malfunction warning)	= ON
Condition for threshold of engine speed in misjudgment mask at IG ON	> 1535 rpm
Internal malfunction flag of generator (electrical malfunction warning)	= ON

Time needed for diagnosis: 500 ms

Malfunction indicator light illumination: Does not illuminate even when malfunction occurs. (Charge warning light illuminates.)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0685 ECM/PCM POWER RELAY CONTROL CIRCUIT/OPEN


DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Hard to start
- Improper idling
- Poor driving performance

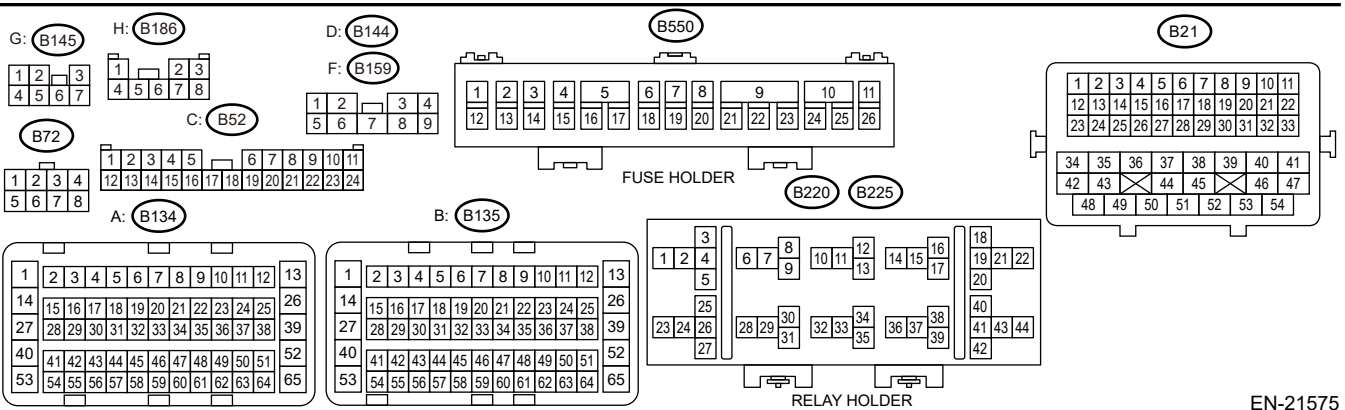
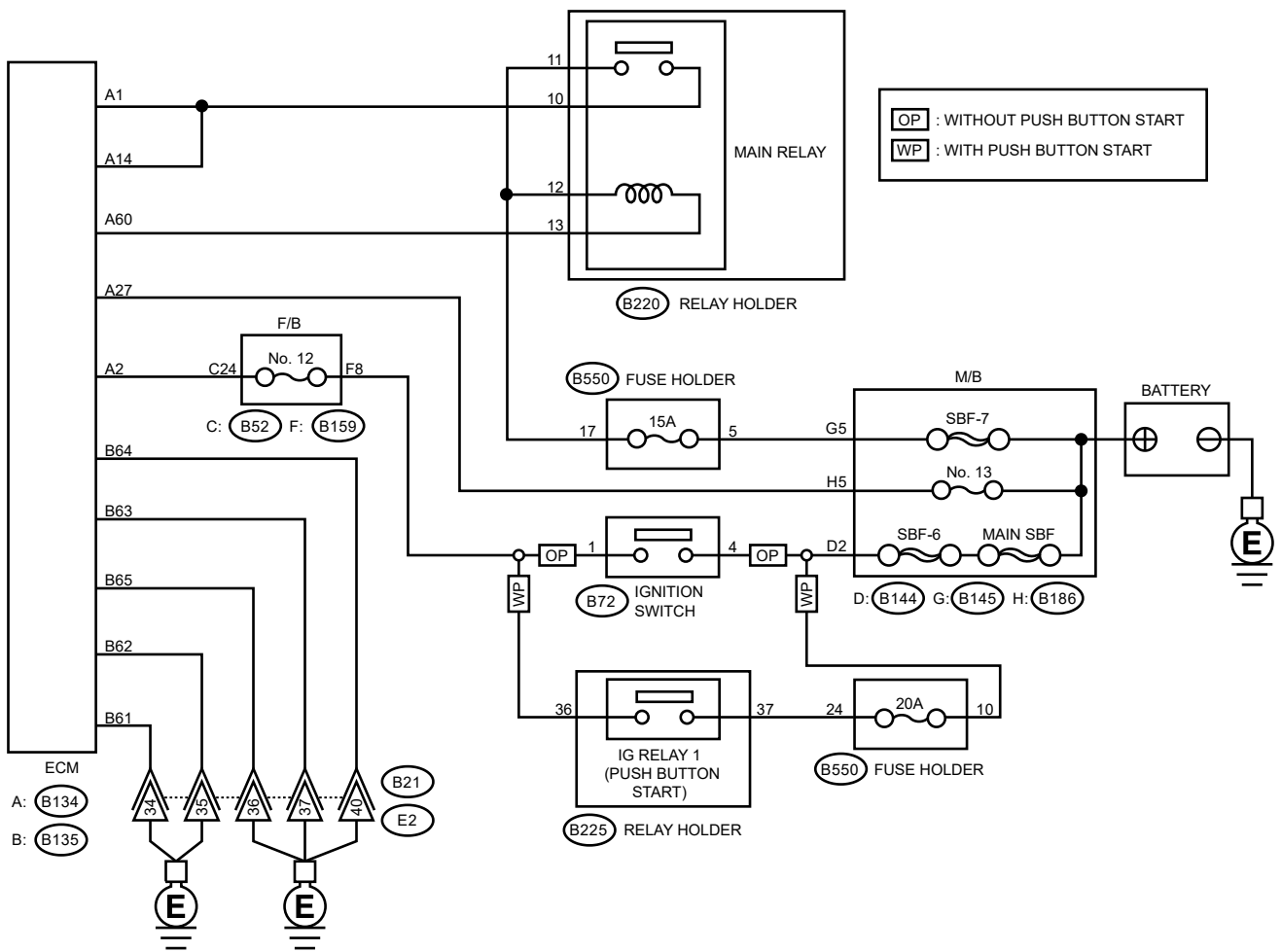
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode. and Inspection Mode !\[\]\(fd0f3d0c9a8d9b3ff3951bcf7c4bf0c0_img.jpg\) \[Ref. to ENGINE \\(DIAGNOSTICS\\)\\(H4DO\\)>Inspection Mode.\]\(#\)](#)**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





EN-21575

1. CHECK ECM CONNECTOR.

Check the connecting condition of ECM connector.

Is the ECM connector correctly connected?



 [Go to 2.](#)



Yes

No

Connect the ECM connector correctly.

2. CHECK HARNESS BETWEEN ECM AND MAIN RELAY CONNECTOR.



1. Turn the ignition switch to OFF.
2. Remove the main relay.
3. Disconnect the connector from ECM.
4. Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(B134) No. 60 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 3.](#)

No

Repair the short circuit to ground in harness between ECM connector and main relay connector.

3. CHECK HARNESS BETWEEN ECM AND MAIN RELAY CONNECTOR.



1. Install the main relay.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and engine ground.

Connector & terminal

(B134) No. 1 (+) — Engine ground (-):

(B134) No. 17 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

repair the harness and connector.

Note:

In this case, repair the following item:

- **Short circuit to power supply in harness between ECM connector and main relay connector**
- **Defective main relay**

No

Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Detect the main relay stuck to ON.

Judge as NG when ECM keeps operating for more than predetermined time although the main relay does not turn to OFF after ignition switch is turned to OFF.

2. COMPONENT DESCRIPTION

The main relay controls the current in the coil section to switch ON/OFF the ECM by receiving instructions from the ignition switch and Evaporative Leak Check Module.

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Main relay	OFF instruction

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once when the enable conditions are established with the ignition switch OFF → ON.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
ECM status	In operation


Time needed for diagnosis: 2500ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0700 TRANSMISSION CONTROL SYSTEM (MIL REQUEST)

Note:

For the diagnostic procedure, refer to Transmission section.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS

Judge as NG when there is CAN communication with the TCM and there is a MIL lighting request.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
MIL lighting request from TCM	Yes

Time needed for diagnosis: 128ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)



DTC P081A STARTER DISABLE CIRCUIT LOW

Immediately at fault recognition

Trouble symptom:

Failure of engine to start

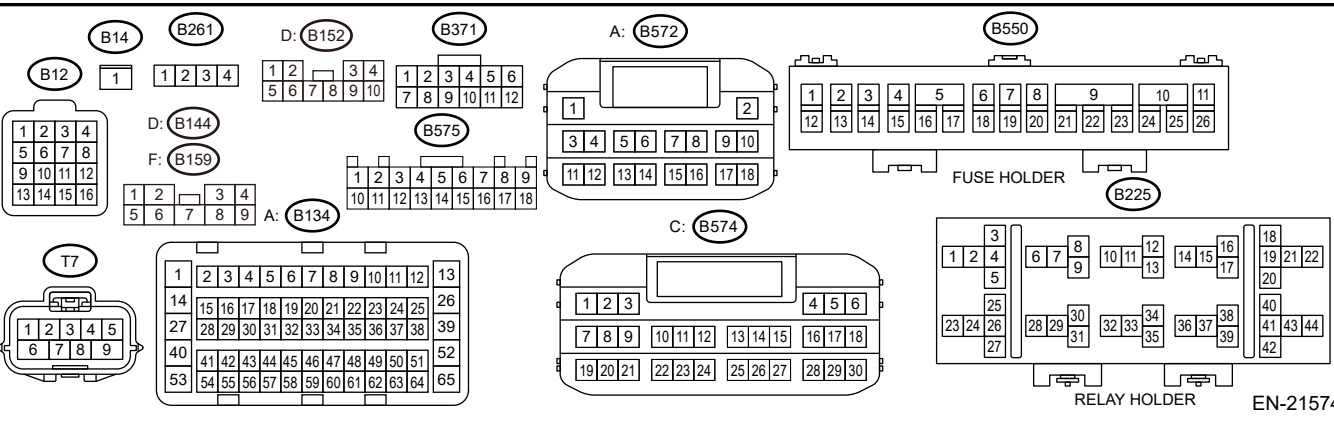
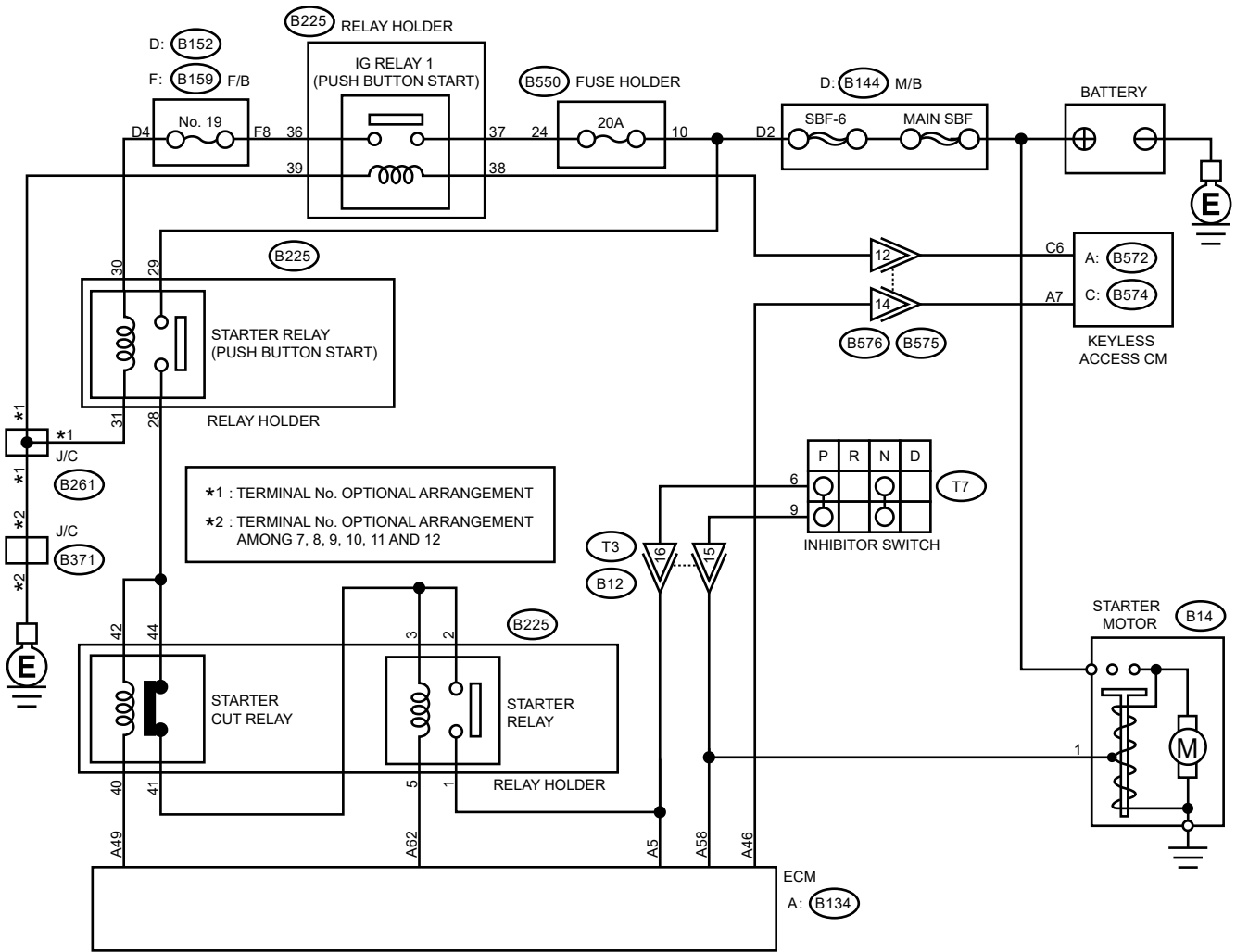
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





- 1. CHECK HARNESS BETWEEN STARTER RELAY (PUSH BUTTON START) CONNECTOR AND STARTER CUT RELAY CONNECTOR.**
1. Turn the ignition to OFF.
 2. Remove the starter relay (push button start).
 3. Remove the starter cut relay.




- 4.** Measure the resistance of harness between starter relay (push button start) connector and starter cut relay connector.

Connector & terminal

(B225) No. 28 — (B225) No. 42:

Is the resistance less than 1 Ω ?

Yes

 [Go to 2.](#)

No

Repair the open circuit in harness between starter relay (push button start) connector and starter cut relay connector.

2. CHECK HARNESS BETWEEN ECM AND STARTER CUT RELAY CONNECTOR.

- 1.** Disconnect the connector from ECM.
- 2.** Measure the resistance of harness between ECM connector and starter cut relay connector.

Connector & terminal

(B134) No. 49 — (B225) No. 40:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit of harness between ECM connector and starter cut relay connector.

3. CHECK STARTER CUT RELAY.

- 1.** Connect the battery to starter cut relay terminals No. 40 and No. 42.
- 2.** Measure the resistance between starter cut relay terminals.

Terminals


No. 41 —No. 44:

Is the resistance 1 M Ω or more?

Yes

Repair the poor contact of ECM connector.

No

Replace the starter cut relay.  [Ref. to SECURITY AND LOCKS>Starter Cut Relay.](#)

1. OUTLINE OF DIAGNOSIS

Detect abnormal continuity in the starter cut relay.

Judge as NG when the starter cut relay output line is open.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 8V
Engine speed	Changes from 0 rpm to 500 rpm or more
Vehicle speed	< kSTSPD ()
Starter cut relay drive	OFF

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Starter cut relay control signal that exceeds battery voltage × 0.34 V	Not detected

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

**ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC P0851 PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW**

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

Improper idling

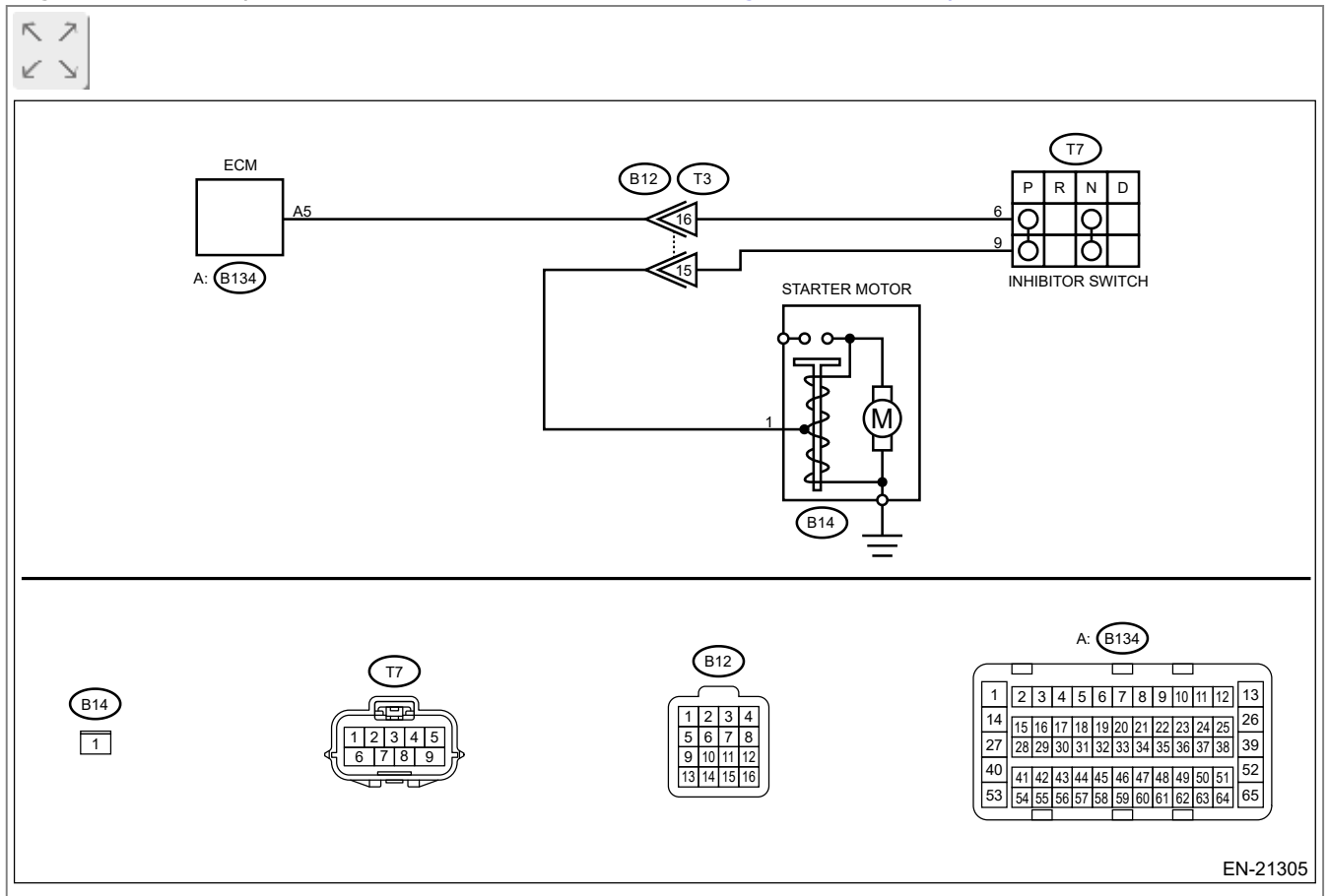
Caution:

- After servicing or replacing faulty parts, perform Clear Memory Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
- Use the check board when measuring the ECM terminal voltage and resistance.

1. AT MODEL

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK SELECT CABLE.

Is there any fault in select cable?

Repair or adjust the select cable. Ref. to CONTROL SYSTEMS>Select



[Cable.](#)

No



[Go to 2.](#)

2. CHECK INPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Place the select lever in other than "P" range and "N" range.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B134) No. 5 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Repair the poor contact of ECM connector.

No



[Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND TRANSMISSION HARNESS CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from ECM and transmission harness connector (T3).
3. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 5 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes



[Go to 4.](#)

No

Repair the short circuit to ground in harness between ECM connector and transmission harness connector.


4. CHECK TRANSMISSION HARNESS CONNECTOR.

1. Disconnect the connector from inhibitor switch.
2. Measure the resistance between transmission harness connector and engine ground.

Connector & terminal

(T3) No. 16 — Engine ground:

Is the resistance 1 M Ω or more?

Yes	Replace the inhibitor switch.  Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch.
No	Repair short circuit to ground in harness between transmission harness connector and inhibitor switch connector.

2. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of neutral SW.

Judge as NG when the ECM neutral terminal input differs from the reception data from TCM.

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Starter relay feedback voltage	< Battery voltage × 0.35 V
Data received from TCM	≠ "P" range/"N" range

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously in 2 seconds after starting the engine.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value


Malfunction Criteria	Threshold Value
Voltage of the neutral position switch signal	≤ Battery voltage ×0.19 V

Time needed for diagnosis: 80 ms × 80 time(s)

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

6. MT MODEL

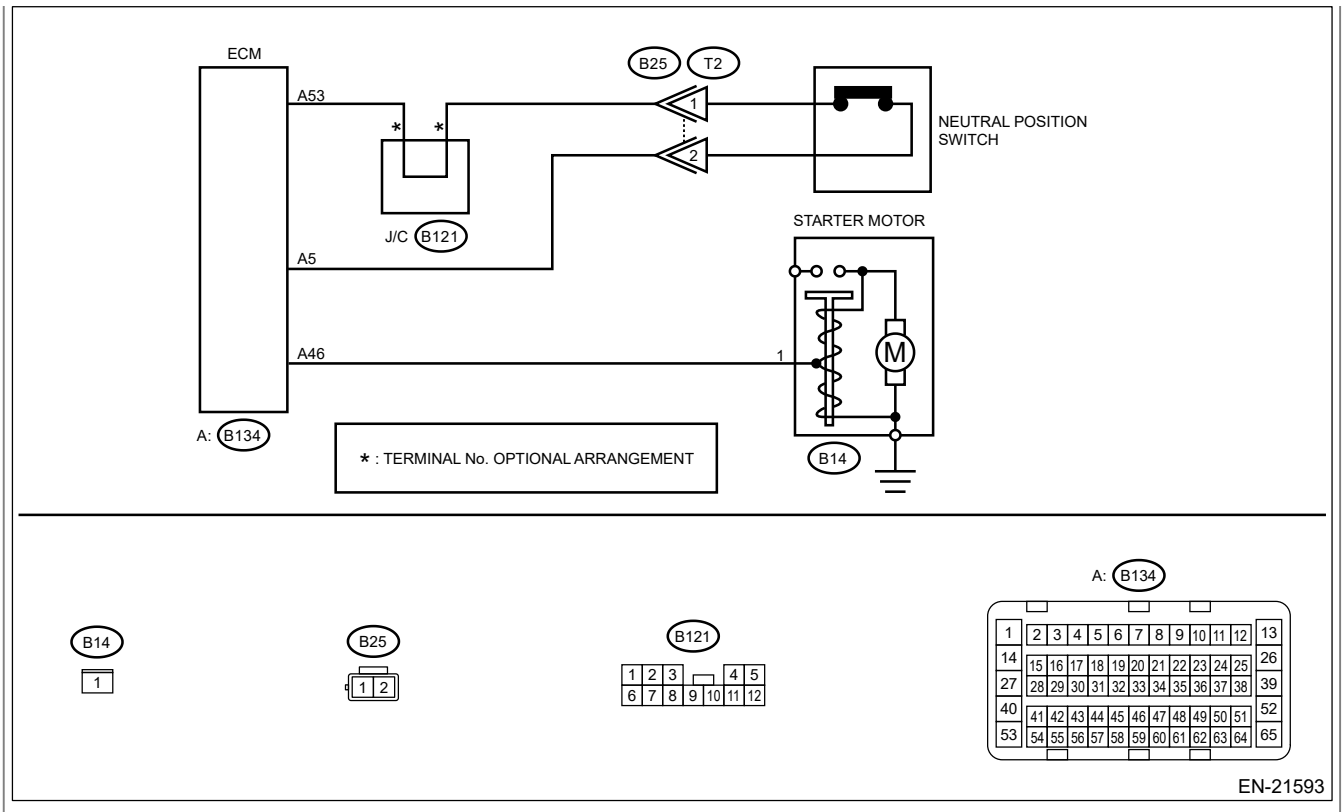
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode. and Inspection Mode !\[\]\(84adebc4a9e78c4c1c7cf356a810b3d7_img.jpg\) \[Ref. to ENGINE \\(DIAGNOSTICS\\)\\(H4DO\\)>Inspection Mode.\]\(#\)](#)**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





1. CHECK INPUT SIGNAL OF ECM. ▼

1. Turn the ignition switch to ON.
2. Place the shift lever in a position other than neutral.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B134) No. 5 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Repair the poor contact of ECM connector.

No

[Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH 1 CONNECTOR. ▼


1. Turn the ignition switch to OFF.
2. Disconnect the connectors from ECM and neutral position switch 1.
3. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 5 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

Replace the neutral position switch 1.  [Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL\(6MT\)>Switches and Harness.](#)

No

Repair the short circuit to ground in harness between ECM connector and neutral position switch 1 connector.

7. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of neutral SW.

Judge as NG when there is no change in the neutral SW even if the driving shift was applied. (There is neutral SW ON/OFF inversion from the vehicle speed and engine speed.)

8. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Change from driving condition a) to b) a)	$= 3\text{time(s)}$
Vehicle speed and Engine speed	$\leq 0\text{km/h (0MPH)}$ $\geq 550\text{rpm}$ and $\leq 850\text{rpm}$
b) Vehicle speed and Engine speed	$\leq 64\text{km/h(39.8M PH)}$ $\geq 1450\text{rpm}$ and $\leq 2050\text{rpm}$

9. GENERAL DRIVING CYCLE

Perform the diagnosis continuously in 2 seconds after starting the engine.

10. DIAGNOSTIC METHOD

Judge NG when the malfunction criteria below are completed determined times or more after the neutral SW change.

Judgment value

Malfunction Criteria	Threshold Value
Neutral switch output voltage	$\leq \text{Battery voltage} \times 0.19 \text{ V}$

Time needed for diagnosis: 3time(s)

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

**ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC P0852 PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH**

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

Improper idling

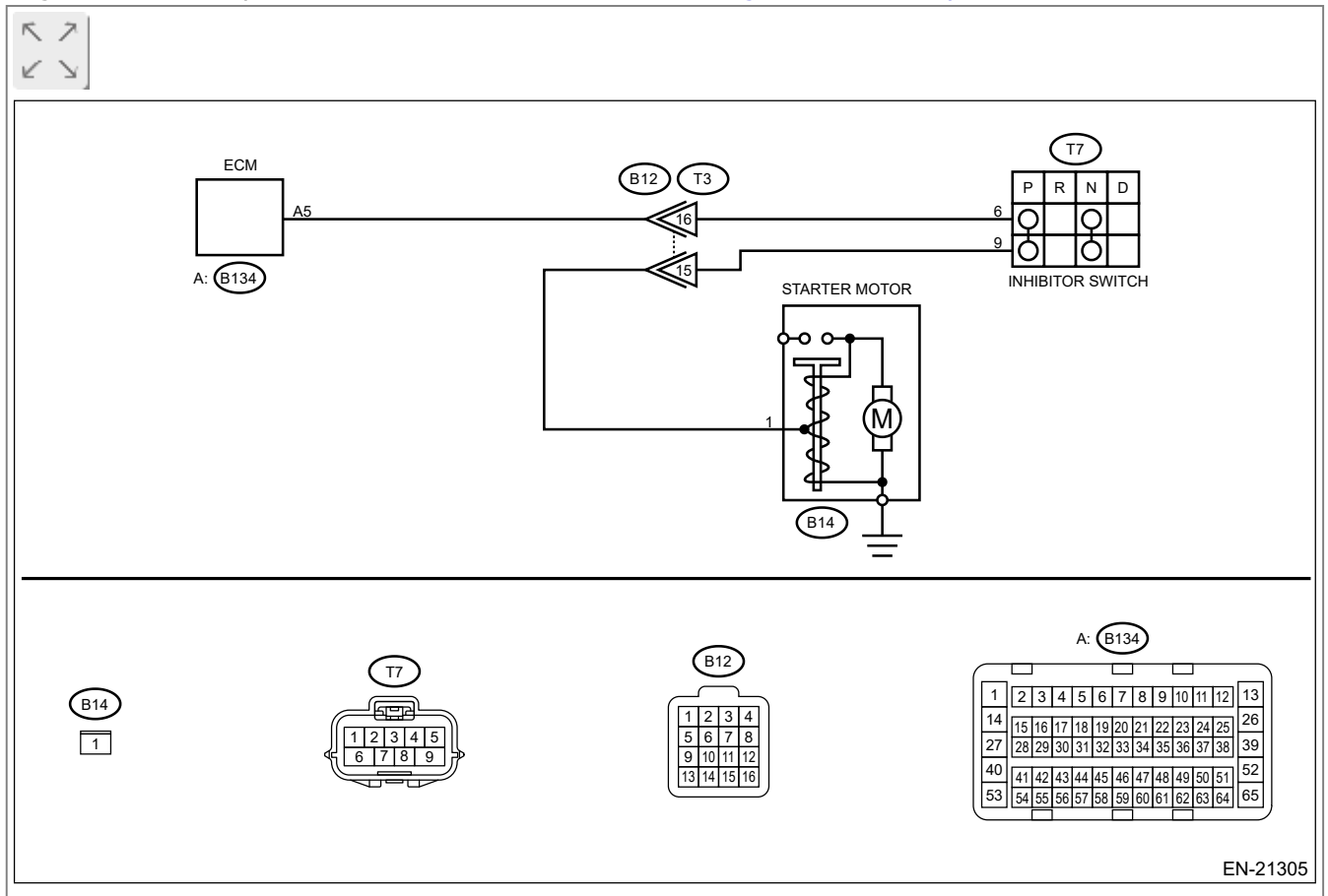
Caution:

- After servicing or replacing faulty parts, perform Clear Memory Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
- Use the check board when measuring the ECM terminal voltage and resistance.

1. AT MODEL

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



EN-21305

1. CHECK SELECT CABLE.

Is there any fault in select cable?

Yes

Repair or adjust the select cable. Ref. to CONTROL SYSTEMS>Select

[Cable.](#)

No

 [Go to 2.](#)

2. CHECK INPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and chassis ground with select lever at "P" range and "N" range.

Connector & terminal


(B134) No. 5 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes

Repair the poor contact of ECM connector.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from inhibitor switch.
4. Measure the resistance of harness between ECM connector and inhibitor switch connector.

Connector & terminal

(B134) No. 5 — (T7) No. 6:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and inhibitor switch connector**
- **Poor contact of coupling connector**

4. CHECK INHIBITOR SWITCH GROUND LINE.

Measure the resistance of harness between inhibitor switch connector and engine ground.

Connector & terminal

(T7) No. 9 – Engine ground:

Is the resistance less than 5 Ω ?

Yes

Replace the inhibitor switch.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Inhibitor Switch.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- Open circuit of harness between inhibitor switch connector and starter motor ground line
- Poor contact of coupling connector
- Poor contact of starter motor connector
- Poor contact of starter motor ground
- Starter motor

2. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of neutral SW.

Judge as NG when the ECM neutral terminal input differs from the reception data from TCM.

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Starter relay feedback voltage	$<$ Battery voltage $\times 0.35$ V
TCM range status	= "P" range or "N" range

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously in 2 seconds after starting the engine.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value



Malfunction Criteria	Threshold Value
Voltage of the neutral position switch signal	\geq Battery voltage $\times 0.6$ V

Time needed for diagnosis: 64 ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

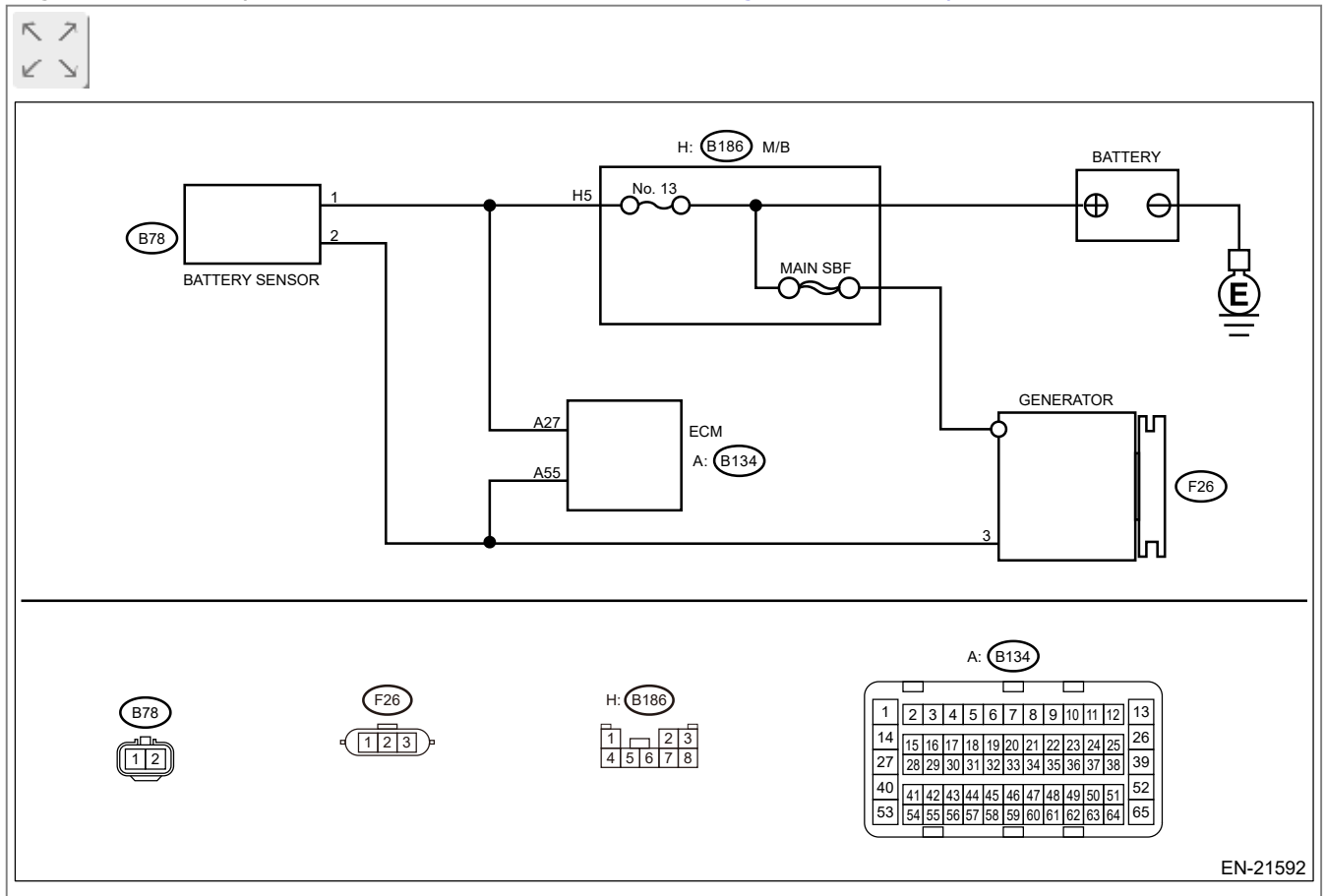
6. MT MODEL

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK INPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Place the shift lever in neutral.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal


(B134) No. 5 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes

Repair the poor contact of ECM connector.

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the neutral position switch.
4. Measure the resistance of harness between ECM connector and neutral position switch connector.


Connector & terminal

(B134) No. 5 — (B25) No. 2:

(B134) No. 53 — (B25) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and neutral position switch 1 connector**
- **Poor contact of coupling connector**

3. CHECK NEUTRAL POSITION SWITCH.

1. Place the shift lever in neutral.
2. Measure the resistance between neutral position switch terminals.

Terminals

No. 1 —No. 2:

Is the resistance less than 1 Ω ?

Yes

Repair the poor contact of neutral position switch connector.

No

Replace the neutral position switch.  [Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL\(6MT\)>Switches and Harness.](#)

7. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of neutral SW.

Judge as NG when there is no change in the neutral SW even if the driving shift was applied. (There is neutral SW ON/OFF inversion from the vehicle speed and engine speed.)

8. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Change from driving condition a) to b)	$= 3\text{time(s)}$
a)	
Vehicle speed and Engine speed	$\leq 0\text{km/h (0MPH)}$ $\geq 550\text{rpm}$ and $\leq 850\text{rpm}$
b)	
Vehicle speed and Engine speed	$\leq 64\text{km/h (39.8MPH)}$ $\geq 1450\text{rpm}$ and $\leq 2050\text{rpm}$

9. GENERAL DRIVING CYCLE

Perform the diagnosis continuously in 2 seconds after starting the engine.

10. DIAGNOSTIC METHOD

Judge NG when the malfunction criteria below are completed determined times or more after the neutral SW change.

Judgment value

Malfunction Criteria	Threshold Value
Neutral switch output voltage	$\geq \text{Battery voltage} \times 0.6 \text{ V}$

Time needed for diagnosis: 3time(s)

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0A3B GENERATOR/ALTERNATOR OVER TEMPERATURE



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

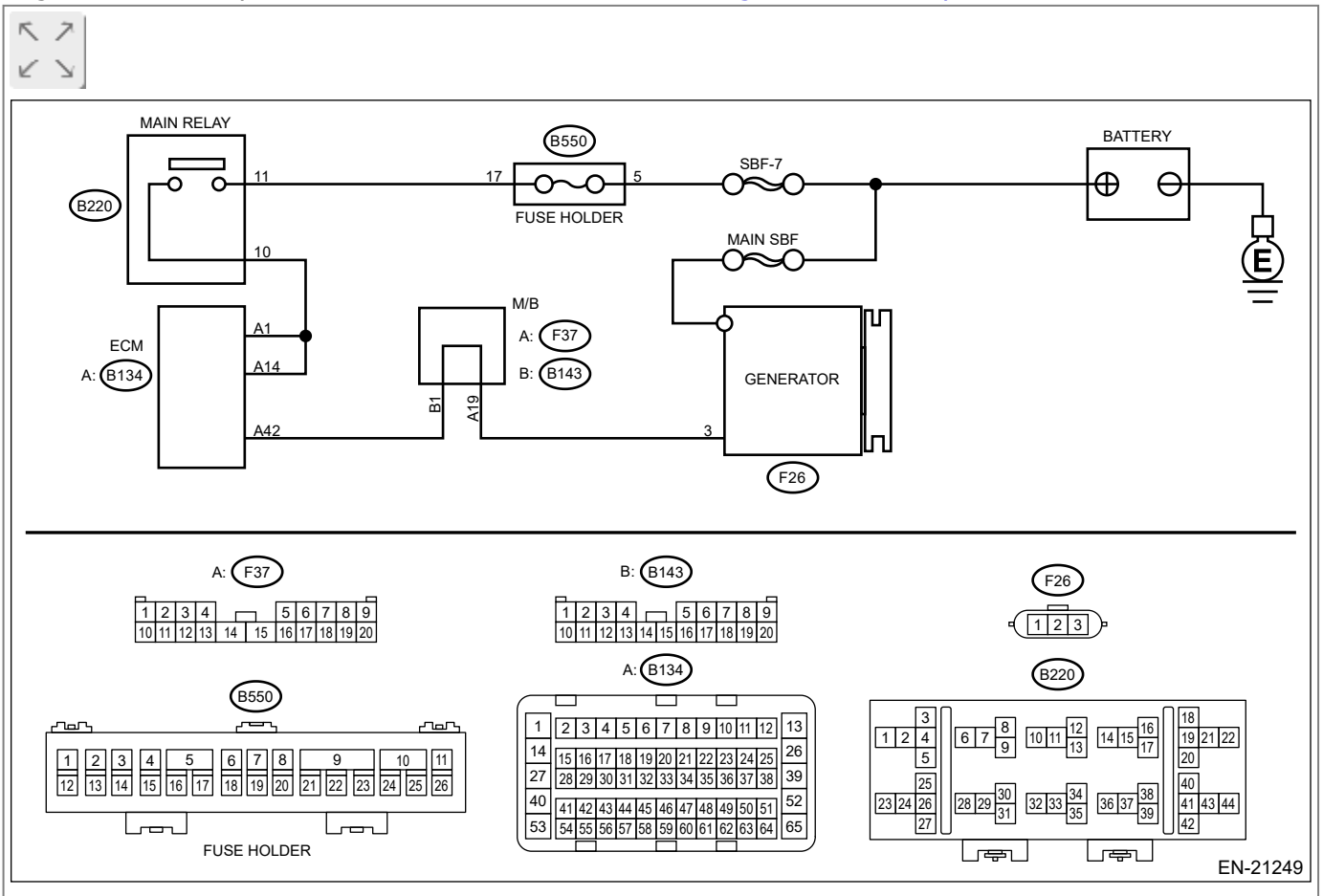
Charge warning light illuminates.

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System.



EN-21249

1. CHECK GENERATOR.


Check the generator vent window.

Is there clogging with foreign objects?

Yes

Eliminate the foreign objects and leave the generator main body intact approx. 20 minutes to cool down.

No


 [Go to 2.](#)

2. CHECK CHARGE WARNING LIGHT.

Turn the ignition switch to OFF and leave the engine intact for 20 minutes or more before starting.

Does the charge warning light remain on?

Yes

Replace the generator.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Generator.](#)

No

This is a temporarily overheating of the generator. It is now back to normal state. Check for clogging with foreign objects in the proximate area such as the generator vent window.

1. OUTLINE OF DIAGNOSIS

The overheating detection sensor is integrated as protection of the generator internal parts. If a malfunction is detected, DTCs will be output.

Charge warning light illuminates.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
LIN communication schedule in progress	= \$01

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

4. DIAGNOSTIC METHOD

Judge as a malfunction when the high temperature malfunction diagnosis flag of the generator is ON, and at the same time, the regulator temperature inside the generator is at or more than the predetermined value.

Judgment value

Secondary Parameters	Execution condition
Internal malfunction flag of generator (high temperature	= ON

malfunction warning) Monitor value of generator internal temperature	$\geq 170 \text{ }^{\circ}\text{C}$
--	-------------------------------------


Time needed for diagnosis: 1000 ms

Malfunction indicator light illumination: Does not illuminate even when malfunction occurs.
(Charge warning light illuminates.)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1160 THROTTLE RETURN SPRING

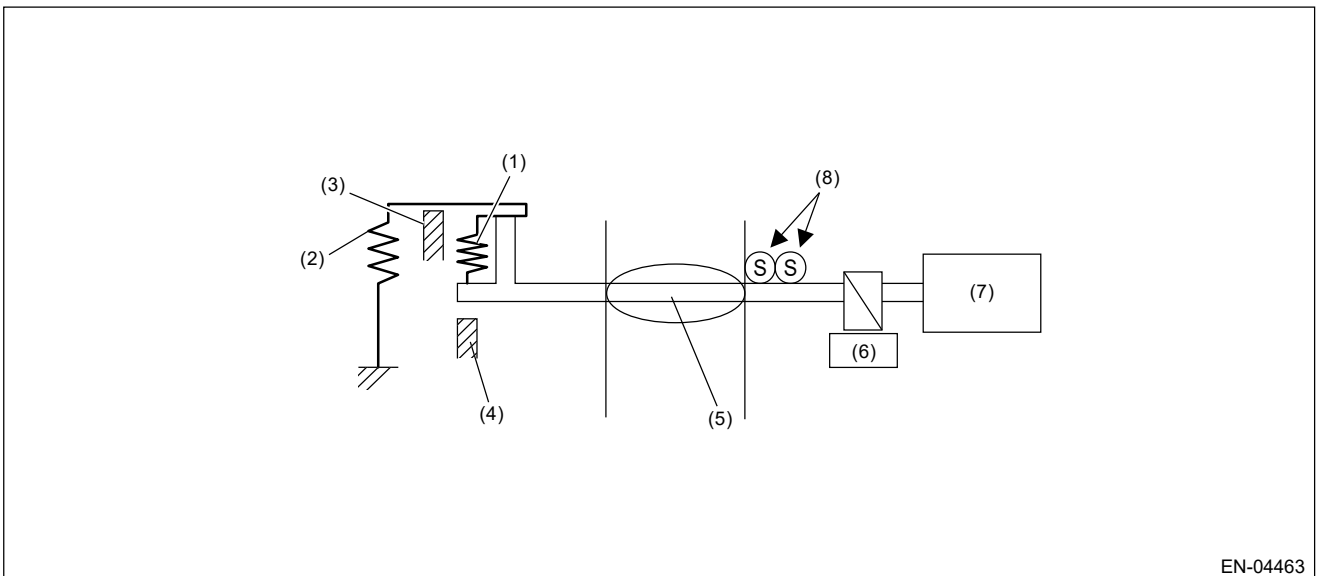
Note:

For the diagnostic procedure, refer to DTC P2101.  Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2101 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the valve is opened more than the default opening angle, but does not move to the close direction with the motor power stopped.

2. COMPONENT DESCRIPTION



EN-04463

- (1) Opener spring
- (2) Return spring
- (3) Intermediate stopper
- (4) Full closed stopper
- (5) Throttle valve
- (6) Gear
- (7) DC motor
- (8) Main and sub throttle position sensor

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 6V
Ignition switch	OFF
Elapsed time after motor continuity OFF	= 1.6 s

4. GENERAL DRIVING CYCLE

- Ignition switch ON → OFF

- Ignition switch OFF → ON (Only after clearing memory)

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Opening variation after continuity is set to OFF	< 2°

Time needed for diagnosis: Less than 1 second



Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC P1449 EVAP SYSTEM CLOG DETECTED (AIR FILTER)

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE..

1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>List of Diagnostic Trouble Code (DTC).


No

 Go to 2.

2. CHECK DRAIN TUBE B OF LEAK CHECK VALVE ASSEMBLY.

Is the drain tube B of leak check valve assembly clogged?

Yes

Replace the drain tube B of leak check valve assembly.  Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Leak Check Valve Assembly.


No

 Go to 3.


3. CHECK DRAIN TUBE C, DRAIN PIPE AND DRAIN HOSE.

Is the drain tube C, drain pipe or drain hose on the atmospheric release side of leak check valve assembly clogged?

Yes

Replace the drain tube C, drain pipe or drain hose.  Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Filler Pipe.

No

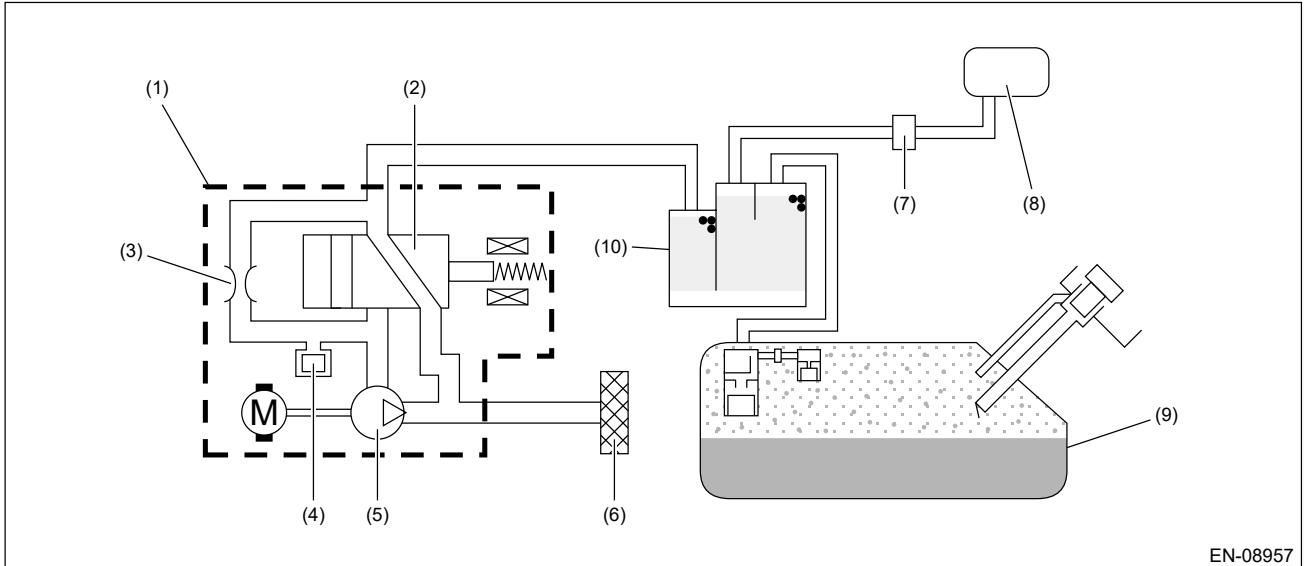
Replace the leak check valve assembly.  Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Leak Check Valve Assembly.

1. OUTLINE OF DIAGNOSIS

Detect the drain filter clogging by the pressure change during purge introduction.

Judge as drain filter clogging malfunction if the pressure in the evaporative emission system piping suddenly decreases by the purging.

2. COMPONENT DESCRIPTION



- | | | |
|---|----------------------------------|---------------|
| (1) Leak check valve ASSY | (5) Vacuum pump | (9) Fuel tank |
| (2) Switching valve | (6) Drain filter | (10) Canister |
| (3) Reference orifice (0.02 inch orifice) | (7) Purge control solenoid valve | |
| (4) Pressure sensor | (8) Intake manifold | |

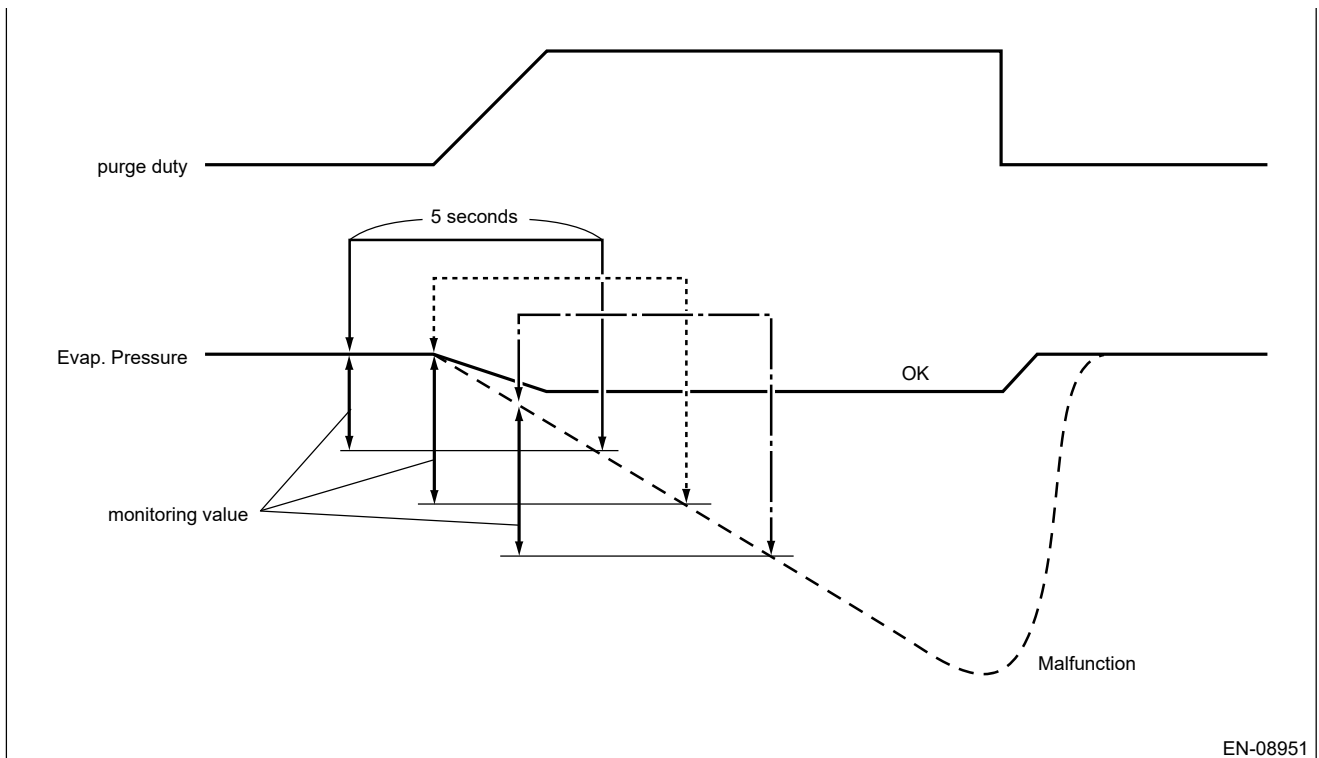
3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Elapsed time after starting the engine	$\geq 20000\text{ms}$
Evaporative Leak Check Module vacuum pump	Not in operation
Evaporative Leak Check Module switching valve	Open

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously when purging is performed after 20000 ms have passed since the engine started.

5. DIAGNOSTIC METHOD



EN-08951

Calculate the difference between the Evaporative Leak Check Module pressure sensor output value of 5 seconds ago and the value at the present moment, and if the value is greater than the judgment value, detect as filter clogging trouble and judge as malfunction.

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Pressure sensor output value as of 5 seconds ago – Current pressure sensor output value	> Value from Map

Map

Vehicle speed km/h (MPH)	0 (0)	20 (12.4)	40 (24.9)	60 (37.3)	80 (49.7)	100 (62.1)	120 (74.6)	300 (186. 4)
Pressure sensor output value as of 5 seconds ago – Current pressure sensor output value Pa (mmHg, inHg)	1151. 4 (8.636 , 0.3)	1151. 4 (8.636 , 0.3)	1151. 4 (8.636 , 0.3)	1151. 4 (8.636 , 0.3)	1151. 4 (8.636 , 0.3)	1151. 4 (8.636 , 0.3)	1151. 4 (8.636 , 0.3)	2209. 1 (16.57 , 0.7)

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1451 EVAP SYSTEM CLOG DETECTED (PIPE)

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE..

1. CHECK DRAIN TUBE BETWEEN CANISTER AND LEAK CHECK VALVE ASSEMBLY. 

Is the drain tube between canister and leak check valve assembly clogged?

Yes

Replace the drain tube between the canister and leak check valve assembly.  Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Canister.



No

 Go to 2.



2. CHECK HOSES BETWEEN CANISTER AND FUEL TANK. 


Are the hoses between the canister and fuel tank clogged?

Yes

Replace the hoses between the canister and fuel tank.  Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Canister.  Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Tank.

No


Replace the canister.  Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Canister.
After the operation is complete, go to the next step.  Go to 3.

3. CHECK EVAPORATIVE EMISSION CONTROL SYSTEM. 

Perform drive cycle I. [Ref. to Target Not Found](#)

Is DTC P1451 displayed on the display?

Yes

Replace the leak check valve assembly.  Ref. to EMISSION CONTROL


[\(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Leak Check Valve Assembly.](#)

No

End.

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to DTC P0455.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0455 EVAP SYSTEM \(CPC\) LEAK DETECTED \(LARGE LEAK\).](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1492 COIL 1 EGR "A" CONTROL CIRCUIT LOW

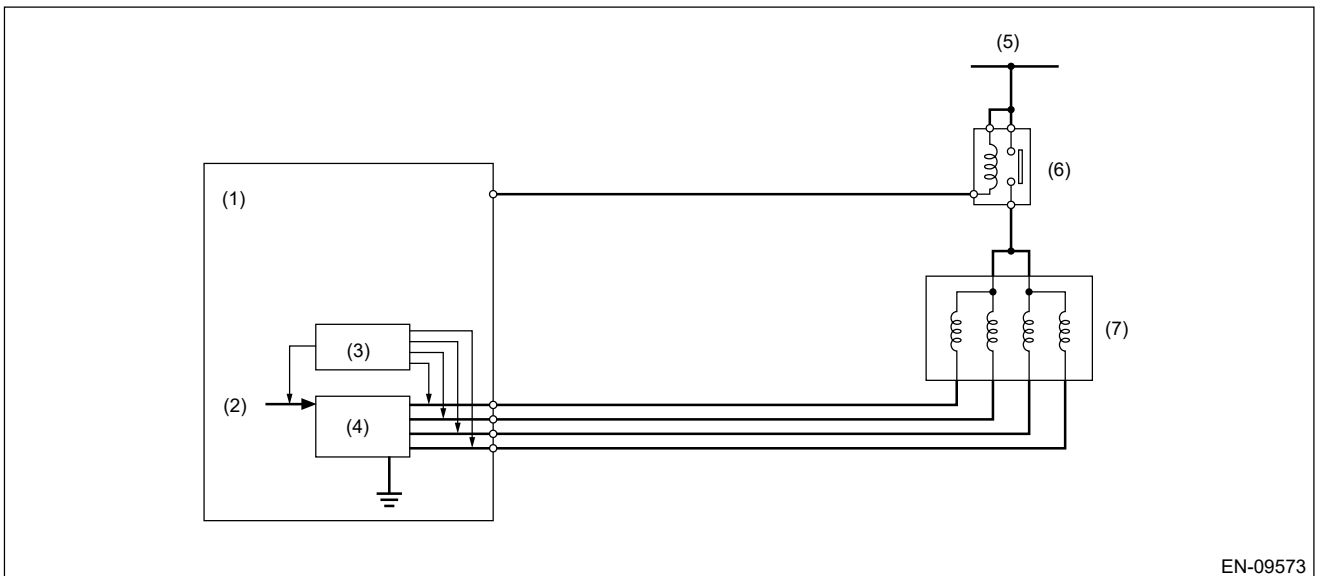
Note:

For the diagnostic procedure, refer to DTC P1498.  Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1498 COIL 4 EGR "A" CONTROL CIRCUIT LOW.

1. OUTLINE OF DIAGNOSIS

- Detects open or short circuit of EGR.
- Judge as NG when the ECM output level differs from the actual terminal level.

2. COMPONENT DESCRIPTION



EN-09573

- (1) Engine control module (ECM)
- (2) Computer unit (CPU)
- (3) Detecting circuit
- (4) Switch circuit
- (5) Battery voltage
- (6) Main relay
- (7) EGR control valve

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
EGR control signal	OFF

4. GENERAL DRIVING CYCLE

Perform diagnosis continuously during EGR operation.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Terminal voltage	\leq Battery voltage $\times 0.34$ V


Time needed for diagnosis: 2500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1493 COIL 1 EGR "A" CONTROL CIRCUIT HIGH

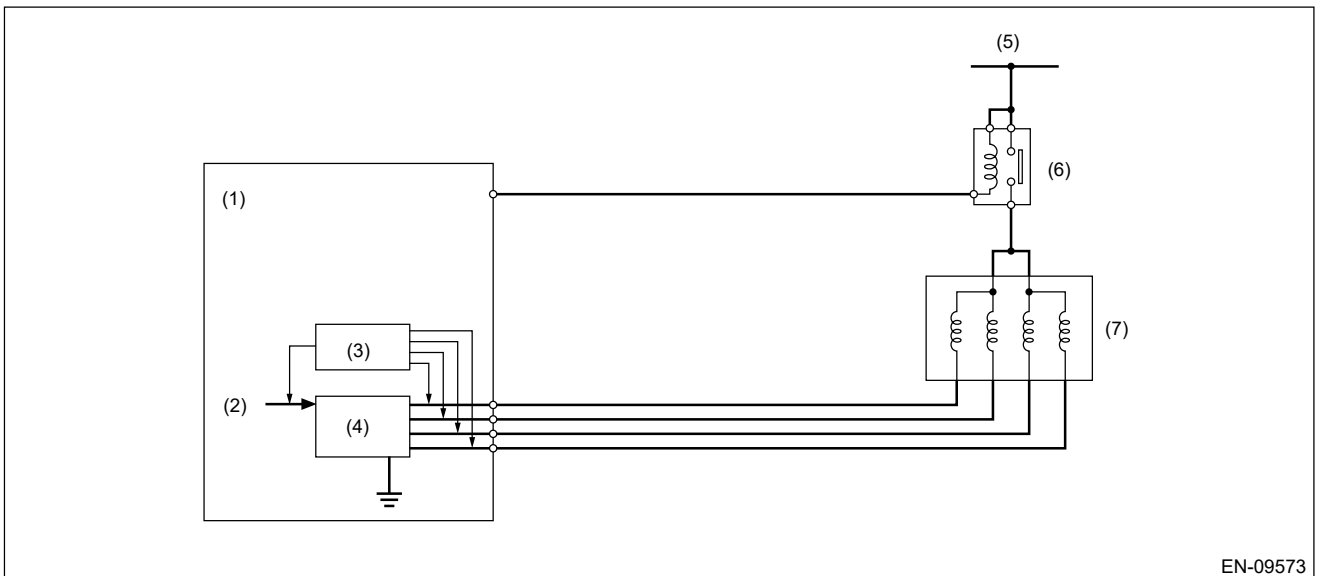
Note:

For the diagnostic procedure, refer to DTC P1499.  Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1499 COIL 4 EGR "A" CONTROL CIRCUIT HIGH.

1. OUTLINE OF DIAGNOSIS

- Detects open or short circuit of EGR.
- Judge as NG when the ECM output level differs from the actual terminal level.

2. COMPONENT DESCRIPTION



EN-09573

- (1) Engine control module (ECM)
- (2) Computer unit (CPU)
- (3) Detecting circuit
- (4) Switch circuit
- (5) Battery voltage
- (6) Main relay
- (7) EGR control valve

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
EGR control signal	ON

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Terminal current	$\geq 6A$


Time needed for diagnosis: 2500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P1494 COIL 2 EGR "A" CONTROL CIRCUIT LOW

Note:

For the diagnostic procedure, refer to DTC P1498.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1498 COIL 4 EGR "A" CONTROL CIRCUIT LOW.](#)

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to DTC P1492.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1492 COIL 1 EGR "A" CONTROL CIRCUIT LOW.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P1495 COIL 2 EGR "A" CONTROL CIRCUIT HIGH

Note:

For the diagnostic procedure, refer to DTC P1499.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1499 COIL 4 EGR "A" CONTROL CIRCUIT HIGH.](#)

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to DTC P1493.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1493 COIL 1 EGR "A" CONTROL CIRCUIT HIGH.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P1496 COIL 3 EGR "A" CONTROL CIRCUIT LOW

Note:

For the diagnostic procedure, refer to DTC P1498.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1498 COIL 4 EGR "A" CONTROL CIRCUIT LOW.](#)

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to DTC P1492.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1492 COIL 1 EGR "A" CONTROL CIRCUIT LOW.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P1497 COIL 3 EGR "A" CONTROL CIRCUIT HIGH

Note:

For the diagnostic procedure, refer to DTC P1499.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1499 COIL 4 EGR "A" CONTROL CIRCUIT HIGH.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P1493.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1493 COIL 1 EGR "A" CONTROL CIRCUIT HIGH.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1498 COIL 4 EGR "A" CONTROL CIRCUIT LOW



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance
- Engine breathing

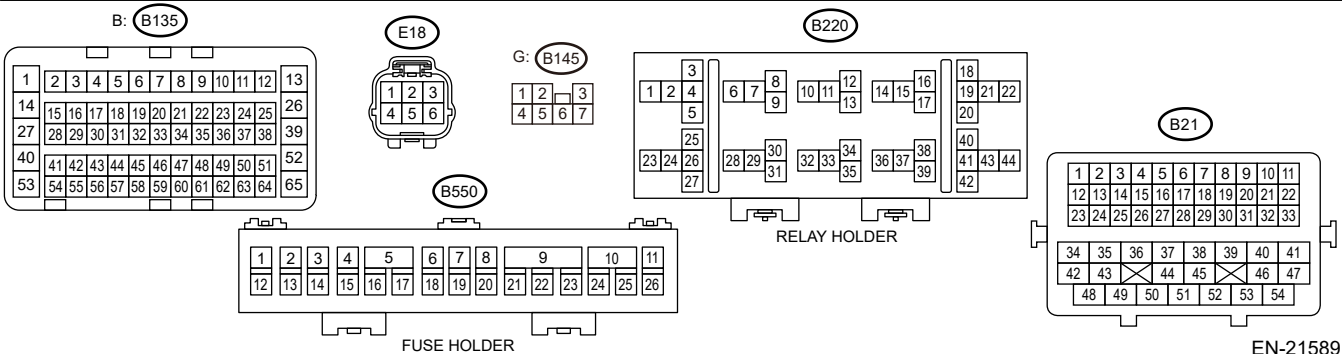
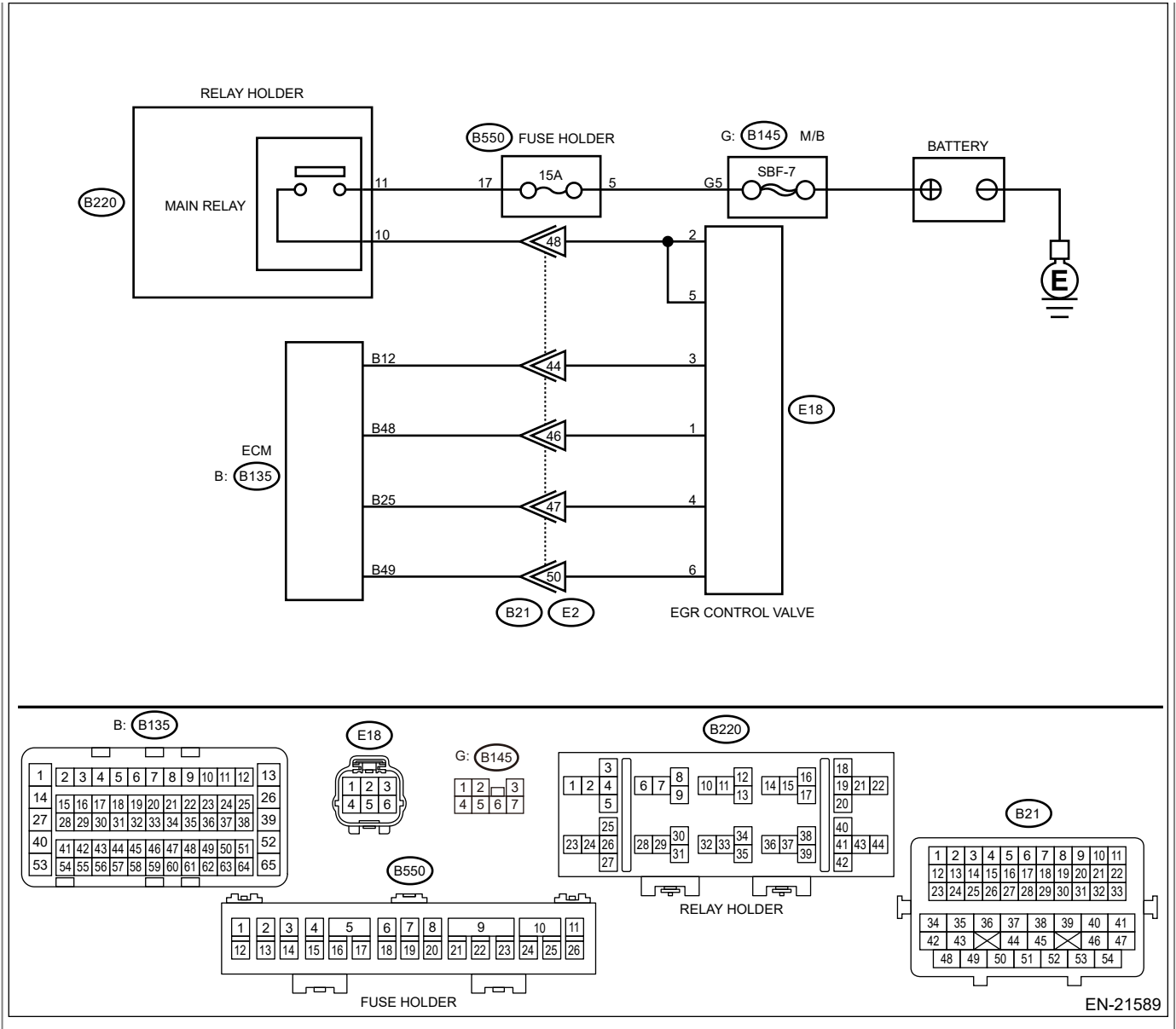
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





EN-21589

1. CHECK POWER SUPPLY TO EGR CONTROL VALVE.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the EGR control valve.
3. Turn the ignition switch to ON.
4. Measure the voltage between EGR control valve connector and engine ground.

Connector & terminal

- (E18) No. 2 (+) – Engine ground (-):
- (E18) No. 5 (+) – Engine ground (-):

Is the voltage 10 V or more?

Yes

[Go to 2.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between EGR control valve and main relay connector**
- **Poor contact of coupling connector**

2. CHECK HARNESS BETWEEN ECM AND EGR CONTROL VALVE CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and EGR control valve connector.

Connector & terminal

DTC P1492; (B135) No. 12 — (E18) No. 3:
DTC P1494; (B135) No. 48 — (E18) No. 1:
DTC P1496; (B135) No. 25 — (E18) No. 4:
DTC P1498; (B135) No. 49 — (E18) No. 6:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and EGR control valve connector**
- **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND EGR CONTROL VALVE CONNECTOR.


1. Disconnect the connector from ECM.
2. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

DTC P1492; (B135) No. 12 — Chassis ground:
DTC P1494; (B135) No. 48 — Chassis ground:
DTC P1496; (B135) No. 25 — Chassis ground:
DTC P1498; (B135) No. 49 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair ground short circuit of harness between ECM connector and EGR control valve connector.

4. CHECK FOR POOR CONTACT.


Check for poor contact between ECM connector and EGR control valve connector.

Is there poor contact in ECM or EGR control valve connector?

Yes


Repair the poor contact of ECM or EGR control valve connector.

No

Replace EGR control valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>EGR Control Valve.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P1492.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1492 COIL 1 EGR "A" CONTROL CIRCUIT LOW.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1499 COIL 4 EGR "A" CONTROL CIRCUIT HIGH



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance
- Engine breathing

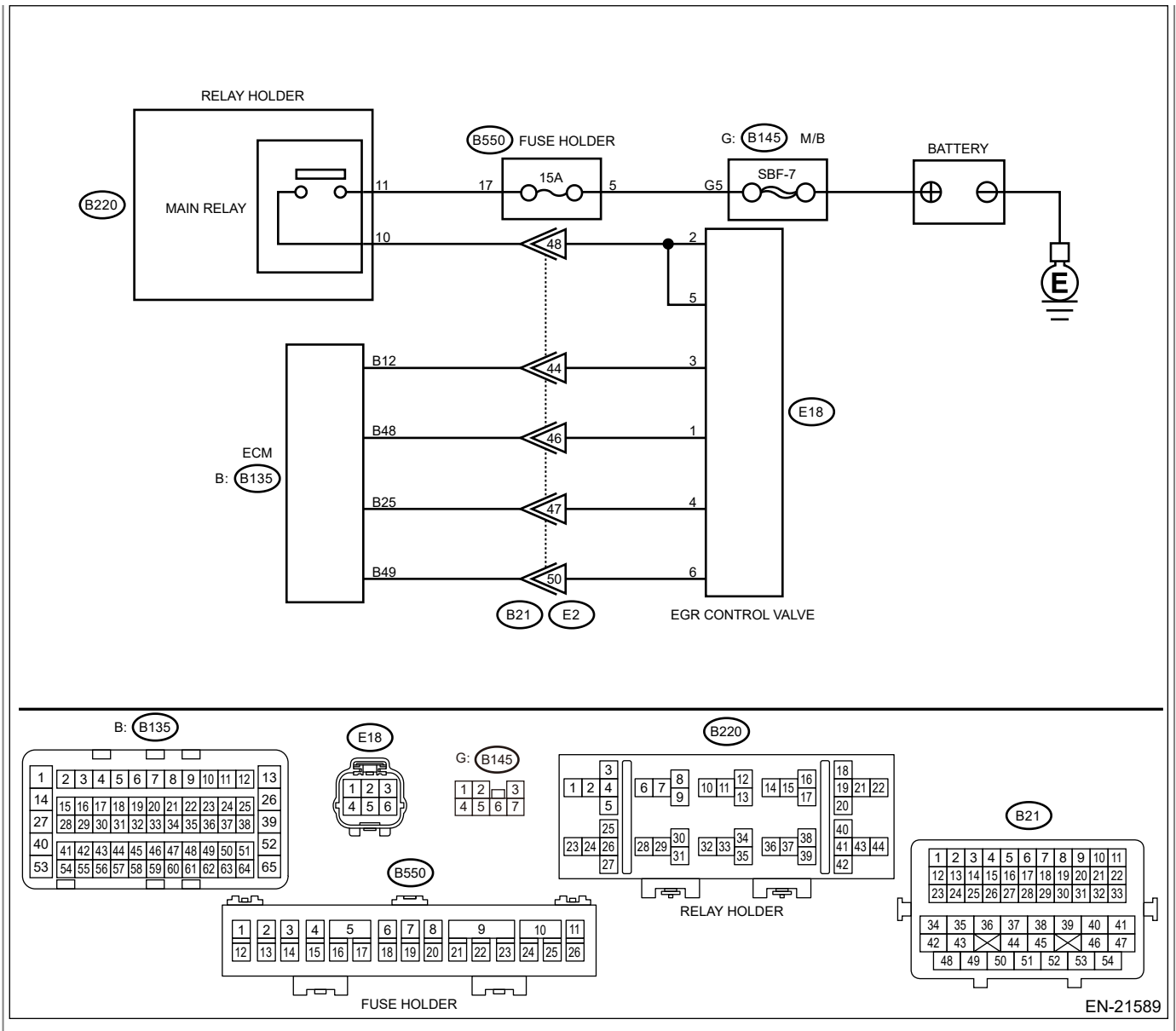
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





1. CHECK HARNESS BETWEEN ECM AND EGR CONTROL VALVE CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the EGR control valve.
3. Disconnect the connector from ECM.
4. Turn the ignition switch to ON.
5. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

- DTC P1493; (B135) No. 12 (+) – Chassis ground (-):
- DTC P1495; (B135) No. 48 (+) – Chassis ground (-):
- DTC P1497; (B135) No. 25 (+) – Chassis ground (-):
- DTC P1499; (B135) No. 49 (+) – Chassis ground (-):



Is the voltage 10 V or more?

Yes

Repair the short circuit to power supply in the harness between the ECM connector and EGR control valve connector.

No

 [Go to 2.](#)

2. CHECK EGR CONTROL VALVE.

Measure the resistance between EGR control valve terminals.

Terminals

DTC P1493; No. 2 — No. 3:

DTC P1495; No. 2 — No. 1:

DTC P1497; No. 5 — No. 4:


DTC P1499; No. 5 — No. 6:

Is the resistance 20 Ω or more?

Yes


Repair the poor contact of ECM connector.

No

Replace EGR control valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>EGR Control Valve.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P1493.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1493 COIL 1 EGR "A" CONTROL CIRCUIT HIGH.](#)


ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1603 ENGINE STALL HISTORY

DTC detecting condition:

Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, clear the memory.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

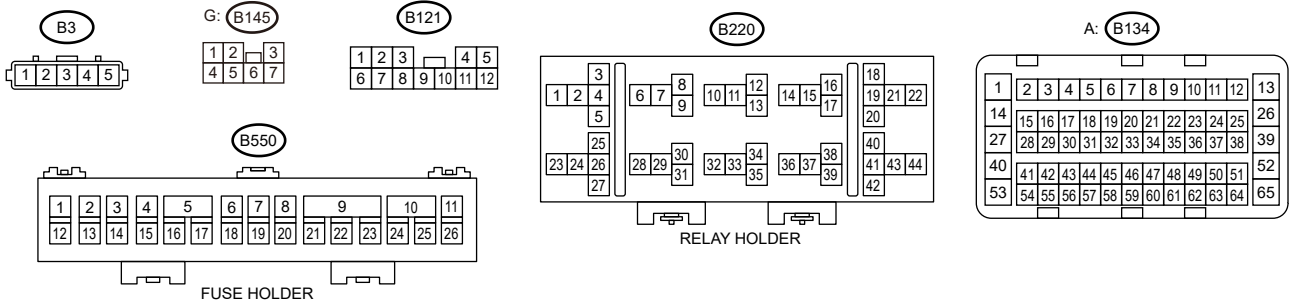
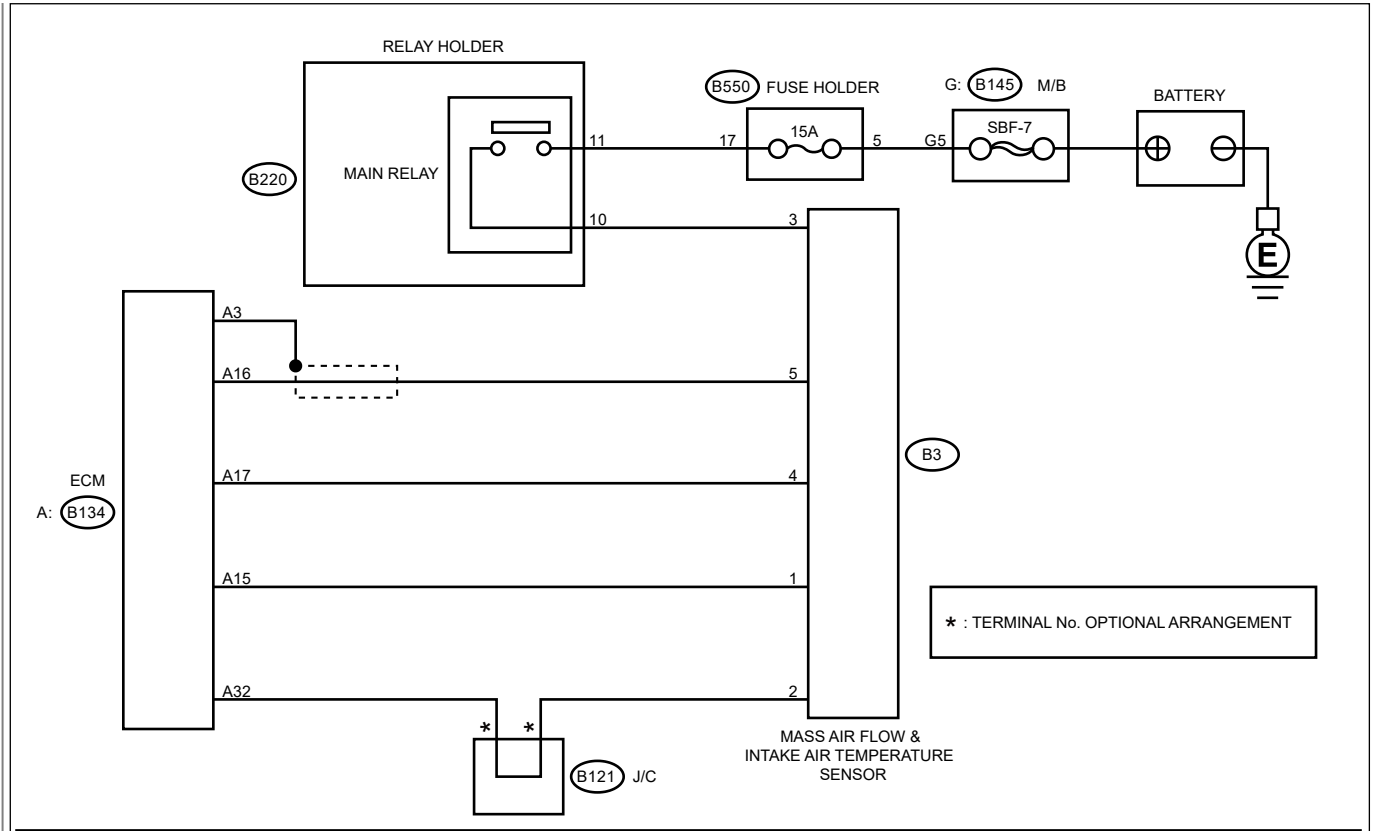
Note:

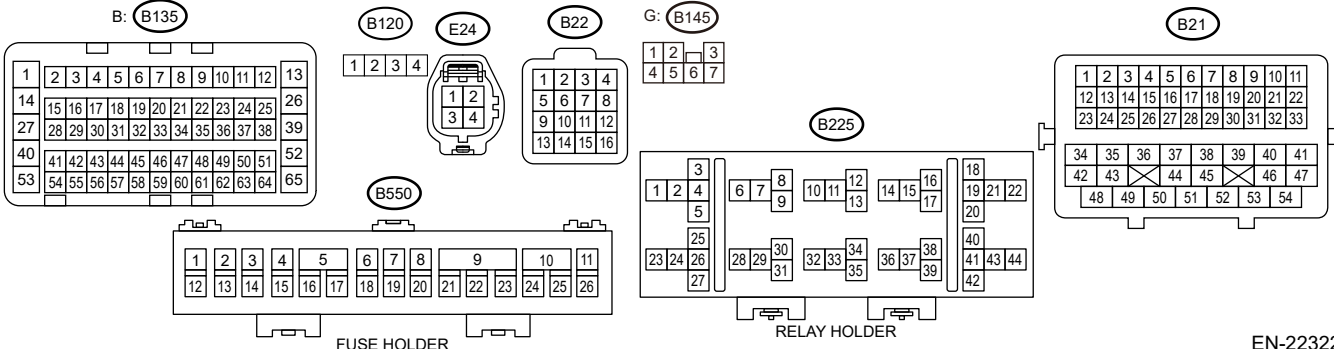
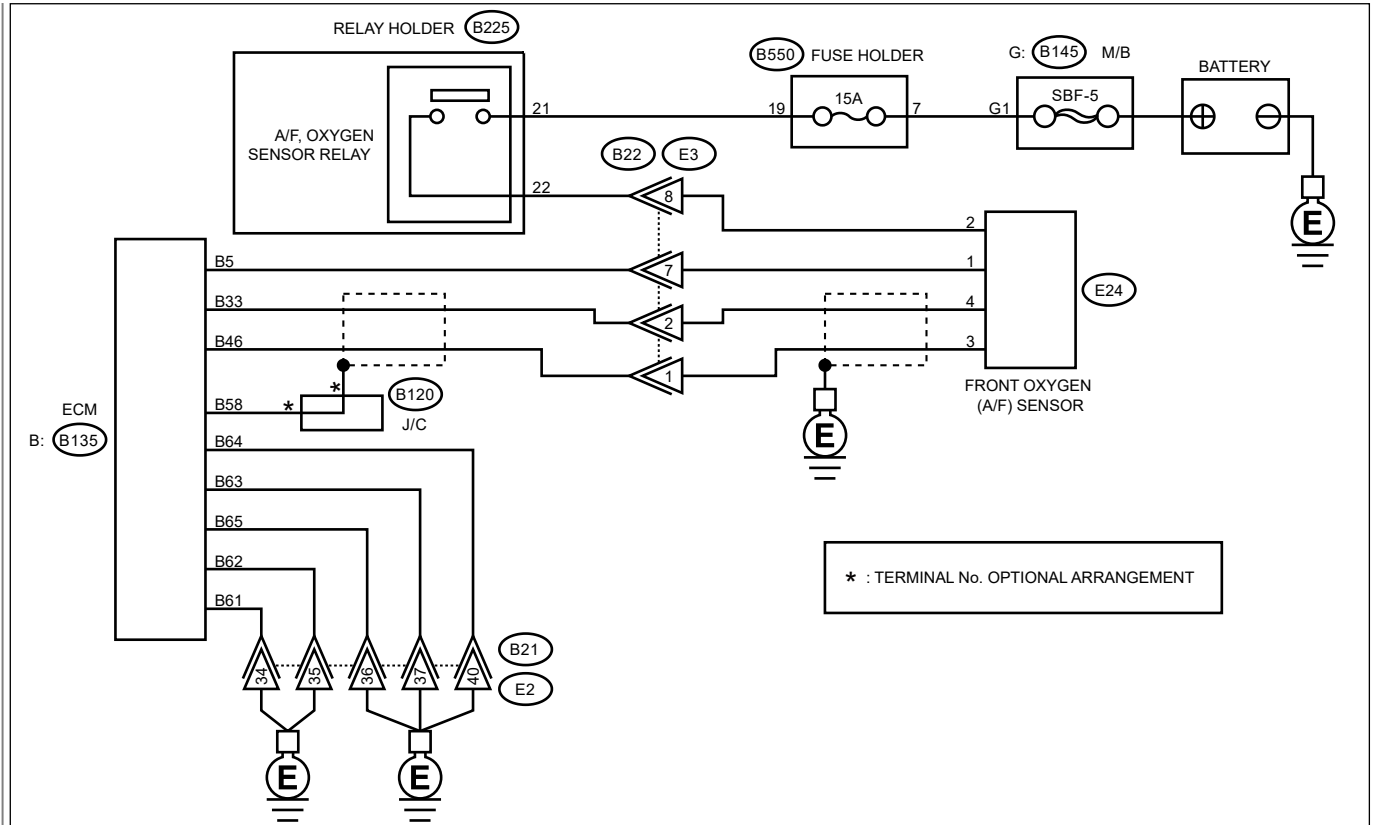
This DTC may be detected even if fault does not occur in the vehicle. If the customer does not ask for inspection, clear memory instead of inspection and return the vehicle to the user.

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)

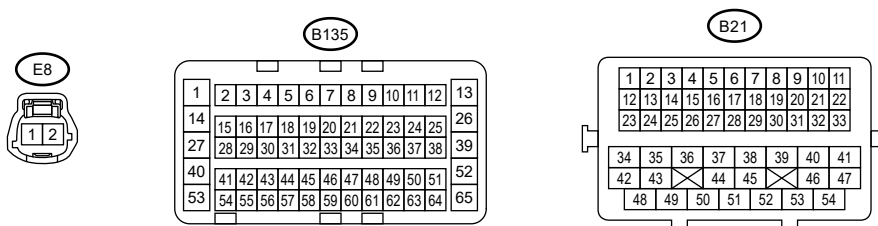
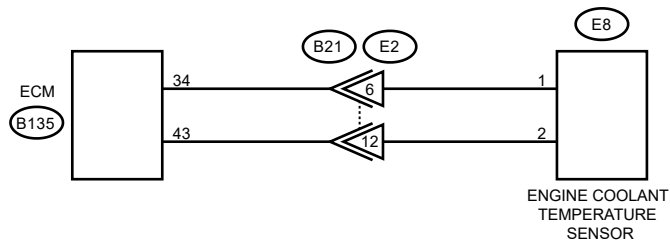




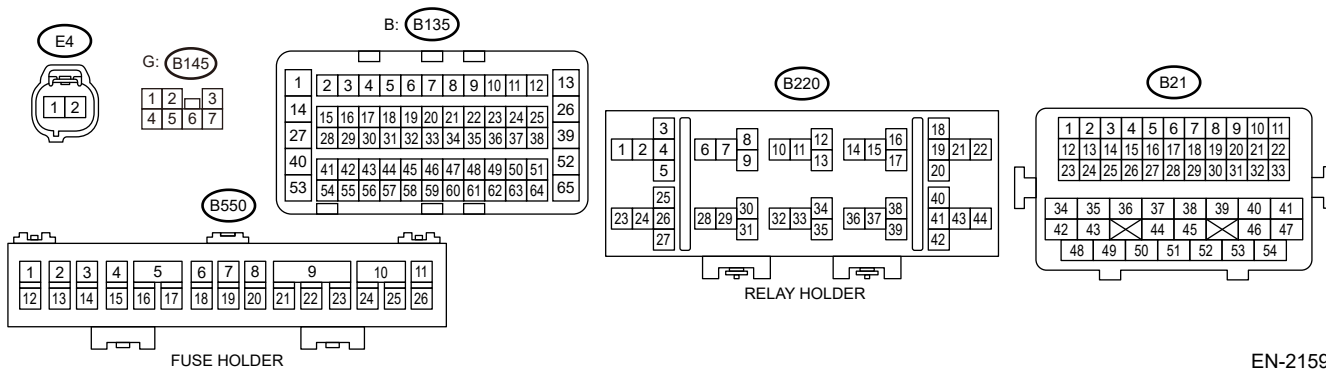
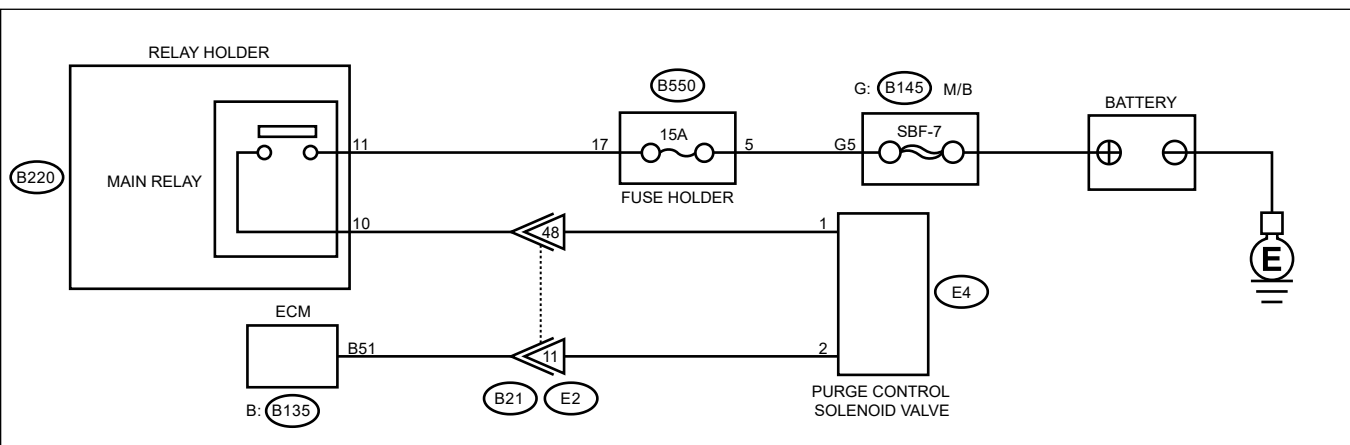


EN-22322



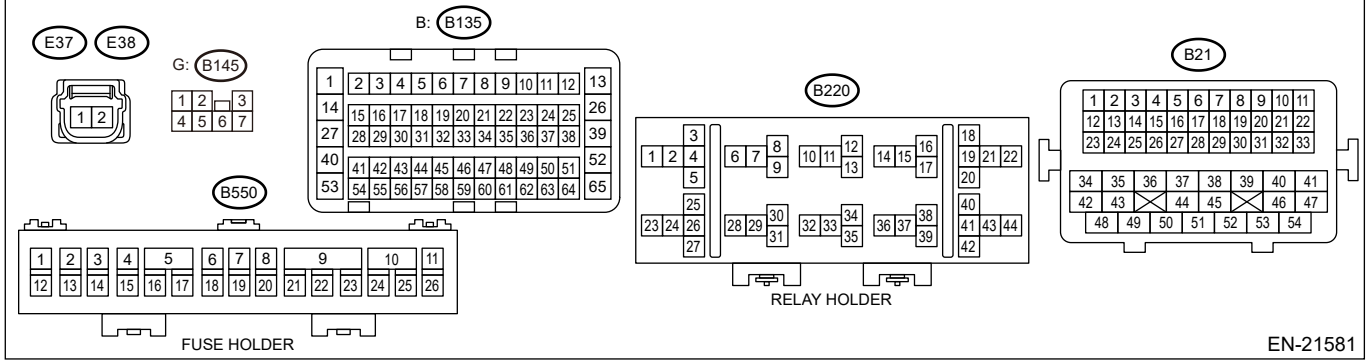
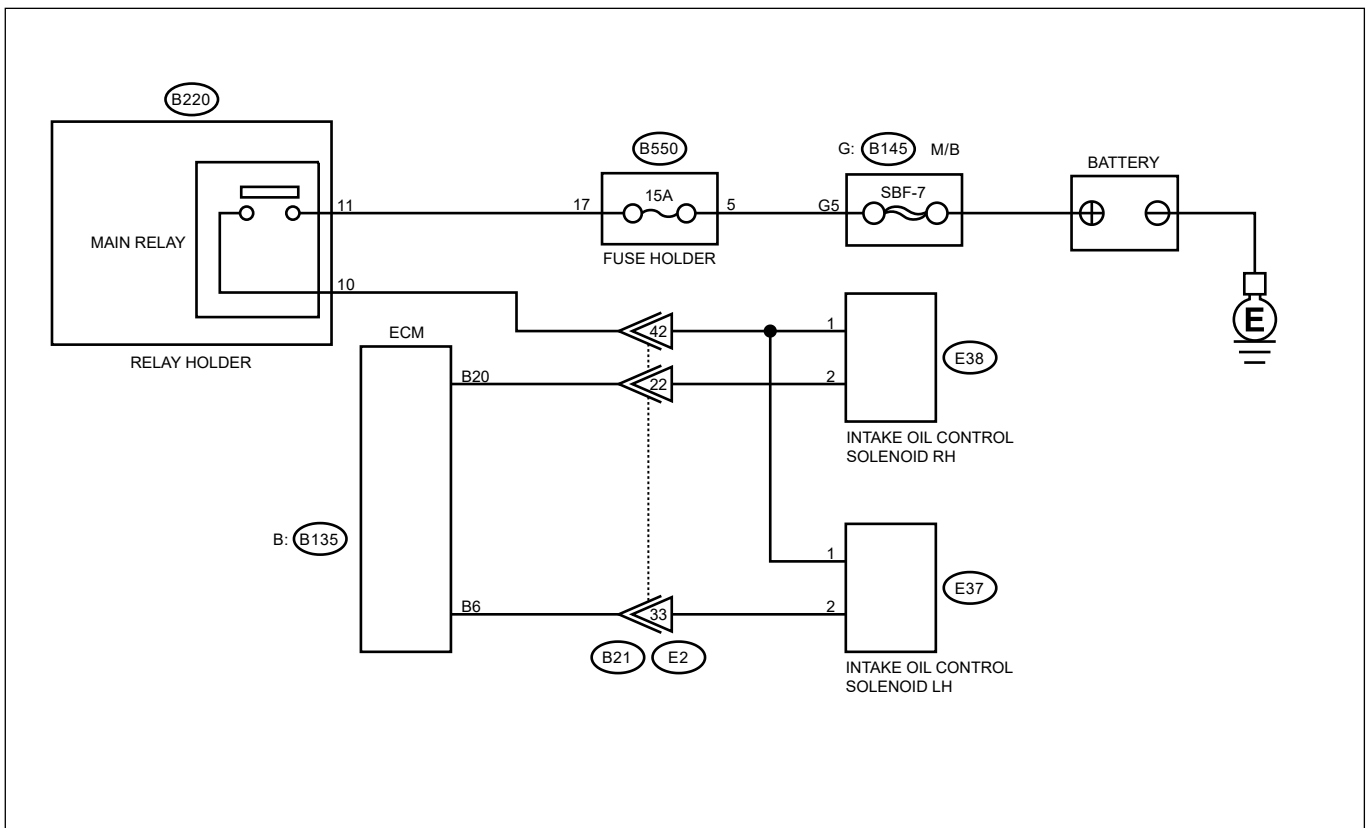


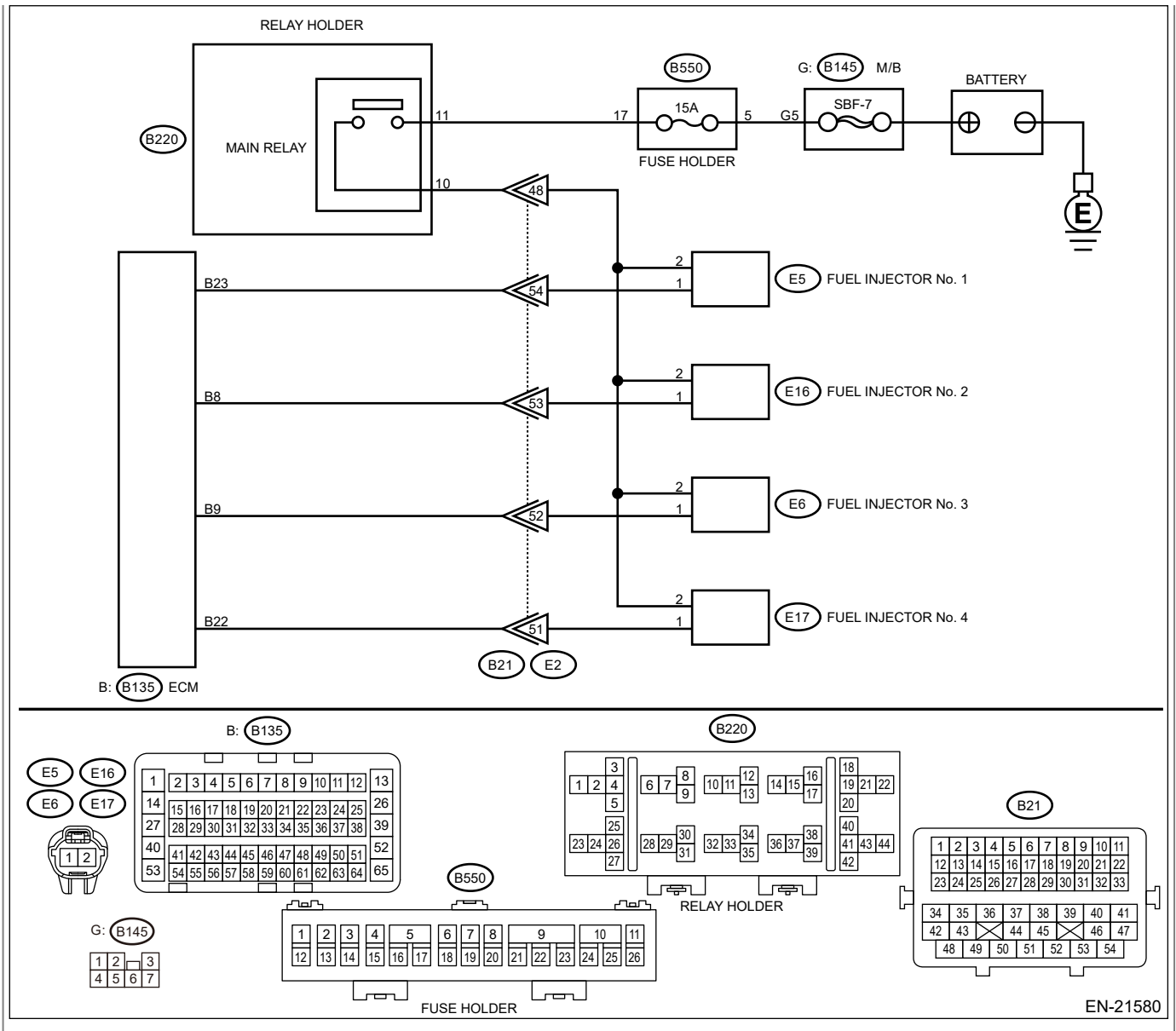
EN-20504



EN-21591







EN-21580

1. CHECK DTC.



Is any other DTC displayed?

Yes

Check DTC using "List of Diagnostic Trouble Code (DTC)". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


[Go to 2.](#)

2. CHECK FREEZE FRAME DATA.




Using the Subaru Select Monitor, read the value in [Fuel Level Input].

Note:


For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [Fuel Level Input] 16.4% or more?

Yes

 [Go to 3.](#)


No

Fuel may be run out. If the fault occurs after refueling, continue the diagnosis.  [Go to 3.](#)

3. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the value in [Control module voltage].

Note:



For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [Control module voltage] 11 V or more?

Yes

 [Go to 4.](#)




No

Check the battery and generator.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery>INSPECTION.](#)  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Generator>INSPECTION.](#)

4. CHECK FOR MALFUNCTION OCCURRENCE.

Did you ask the customer about the driving condition and engine speed status when the fault occurred?

Yes

- The engine speed dropped slowly and then the engine stalled during idling or deceleration:  [Go to 5.](#)
- The engine speed dropped rapidly and then the engine stalled during idling or deceleration:  [Go to 68.](#)
- The engine stalled during standing start, acceleration, or constant speed driving:  [Go to 76.](#)

No

Ask the customer about the driving condition and engine speed status when fault occurred.

5. CHECK FREEZE FRAME DATA.



1. Using the Subaru Select Monitor, read the values in [Short Term Fuel Trim (B1)] and [Long Term Fuel Trim (B1)].

Note:

For detailed operation procedures, refer to "Freeze Frame Data". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

2. Obtain the sum values of [Short Term Fuel Trim (B1)] and [Long Term Fuel Trim (B1)] in each freeze frame data.

Is the sum value of [Short Term Fuel Trim (B1)] and [Long Term Fuel Trim (B1)] within $\pm 15\%$ in each freeze frame data?

Yes

[Go to 49.](#)

No

- More than 15% in each freeze frame data: [Go to 6.](#)
- Less than -15% in any one of freeze frame data: [Go to 34.](#)

6. CHECK AIR INTAKE SYSTEM.



Check the installing condition of the air intake system.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes

Repair the air intake system. [Ref. to INTAKE \(INDUCTION\) \(H4DO\)>General Description.](#)

No

[Go to 7.](#)

7. CHECK PURGE CONTROL SOLENOID VALVE.



Check the purge control solenoid valve. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Purge Control Solenoid Valve>INSPECTION.](#)

Is the purge control solenoid valve OK?

Yes

[Go to 8.](#)

No


Replace the faulty purge control solenoid valve. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Purge Control](#)

[Solenoid Valve.](#)


8. CHECK FREEZE FRAME DATA.


Using the Subaru Select Monitor, read the value in [Stop Light Switch].

Note:

For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [Stop Light Switch] OFF in all [FFD]?


 [Go to 11.](#)

 [Go to 9.](#)

9. CHECK DATA MONITOR.


1. Start the engine and warm up completely.
2. Read the value of [Short Term Fuel Trim-Bank1] both when the brake pedal is released and depressed using Subaru Select Monitor.

Note:

For detailed operation procedures, refer to the "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Does the value of [Short Term Fuel Trim (B1)] with the brake pedal depressed increase by 10% or more compared to when the pedal is released?


Replace the brake booster.  [Ref. to BRAKE>Brake Booster.](#)

 [Go to 10.](#)

10. CHECK DATA MONITOR.

1. Start the engine and warm up completely.
2. While reproducing the faulty condition of the vehicle, read the values of [Short Term Fuel Trim-Bank1] and [Long Term Fuel Trim (B1)] using the Subaru Select Monitor.


Note:

For detailed operation procedures, refer to the "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

3. Obtain the sum values of [Short Term Fuel Trim (B1)] and [Long Term Fuel Trim (B1)].

Is the sum value of [Short Term Fuel Trim (B1)] and [Long Term Fuel Trim (B1)] within $\pm 15\%$?


Yes

 [Go to 11.](#)

No


Replace the brake booster.  [Ref. to BRAKE>Brake Booster.](#)

11. CHECK IGNITION SYSTEM.

Check the ignition system.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostics for Engine Starting Failure>IGNITION CONTROL SYSTEM.](#)

Is the ignition system normal?


Yes

 [Go to 12.](#)

No


Repair the ignition system.  [Ref. to IGNITION\(H4DO\)>General Description.](#)

12. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.


Check the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor>INSPECTION.](#)

Is the mass air flow and intake air temperature sensor normal?

Yes

 [Go to 13.](#)

No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

13. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the mass air flow and intake air temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and the mass air flow and intake air temperature sensor connector.


Connector & terminal

(B134) No. 16 — (B3) No. 5:

(B134) No. 17 — (B3) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 14.](#)

No

Repair the open circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

14. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.



Measure the resistance between the ECM connector and engine ground.


Connector & terminal

(B134) No. 16 — Engine ground:

(B134) No. 17 — Engine ground:

Is the resistance 1 M Ω or more?

Yes


 [Go to 15.](#)

No

Repair the ground short circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

15. CHECK DATA MONITOR.




1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor, read the value of [Calculated LOAD Value], then compare it with the reference value of [Calculated LOAD Value] listed in "Data Monitor" under "Subaru Select Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Note:


- **The value of [Calculated LOAD Value] change depending on how the engine internal parts settle in. If the value is out of standard, judge it**

again by comparing the vehicle with another one with the same specifications and similar conditions such as travel distance.


- For detailed operation procedures, refer to the "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Does the value of [Calculated LOAD Value] fall between 90 — 110% of the value described in the list?

Yes

 [Go to 16.](#)


No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

16. CHECK FRONT OXYGEN (A/F) SENSOR DATA.

1. Start the engine and warm up completely.
2. Raise the engine speed up to 2,500 rpm and maintain it for approx. three minutes.
3. Release the accelerator pedal and idle the engine.
4. Select [Injection Quantity Control] in [Active Test], and read the value of [A/F Sensor #1] at the increase rate of both 12% and –12%.

Note:

- Perform the operation immediately after the engine comes into idling condition, otherwise the front oxygen (A/F) sensor will be cooled.
- For detailed operation procedures, refer to the "Active Test".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Active Test.](#)

Does the value of [A/F Sensor #1] change to less than 0.88 at the increase rate of 12%, and to 1.12 or more at the rate of –12%?

Yes

 [Go to 20.](#)

No

 [Go to 17.](#)

17. CHECK POWER SUPPLY TO FRONT OXYGEN (A/F) SENSOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between front oxygen (A/F) sensor connector and engine ground.

Connector & terminal

(E24) No. 2 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 18.](#)

No

Repair the power supply line.

Note:

In this case, repair the following item:

- **Open circuit in harness between A/F, oxygen sensor relay and front oxygen (A/F) sensor connector**
- **Poor contact of A/F, oxygen sensor relay connector**
- **Poor contact of coupling connector**
- **Malfunction of A/F, oxygen sensor relay**

18. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

Connector & terminal


(B135) No. 5 — (E24) No. 1:

(B135) No. 33 — (E24) No. 4:

(B135) No. 46 — (E24) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 19.](#)

No

Repair the open circuit of harness between ECM connector and front oxygen (A/F) sensor connector.

19. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

Measure the resistance between the ECM connector and engine ground.

Connector & terminal


(B135) No. 5 — Engine ground:

(B135) No. 33 — Engine ground:

(B135) No. 46 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 20.](#)


No

Repair the short circuit to ground in harness between ECM connector and front oxygen (A/F) sensor connector.

20. CHECK FREEZE FRAME DATA.


Using the Subaru Select Monitor, read the values in [Coolant Temp.] and [Ambient air temperature].

Note:


For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [Coolant Temp.] 120°C (248°F) or more? Or is the value of [Coolant Temp.] lower than that of [Ambient air temperature] by 15°C (27°F) or more?


Yes

 [Go to 21.](#)

No


 [Go to 24.](#)

21. CHECK ENGINE COOLANT TEMPERATURE SENSOR.


Check the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Coolant Temperature Sensor>INSPECTION.](#)

Is the engine coolant temperature sensor normal?

Yes

 [Go to 22.](#)

No

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Coolant Temperature Sensor.](#)

22. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the engine coolant temperature sensor.

3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and engine coolant temperature sensor connector.


Connector & terminal

(B135) No. 34 — (E8) No. 1:

(B135) No. 43 — (E8) No. 2:

Is the resistance less than 1 Ω?

Yes

 [Go to 23.](#)

No

Repair the open circuit of the harness between the ECM connector and engine coolant temperature sensor connector.

23. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.

Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(B135) No. 43 — Engine ground:

(B135) No. 34 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 24.](#)


No

Repair the short circuit to ground in harness between ECM connector and engine coolant temperature sensor connector.

24. CHECK FREEZE FRAME DATA.


Using the Subaru Select Monitor, read the value in [Evap Purge Flow].

Note:


For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [Evap Purge Flow] 0% in all freeze frame data?

Yes

 [Go to 30.](#)

No


 [Go to 25.](#)

25. CHECK PURGE CONTROL SOLENOID VALVE.



1. On the item [Active Test], select [CPC Solenoid Valve] and perform fuel pump ON/OFF drive.


Note:

For detailed operation procedures, refer to the "Active Test".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Active Test.](#)


2. Check if the ventilation changes according to ON/OFF switching operation.

Does the ventilation of purge control solenoid valve change correctly?

Yes

 [Go to 29.](#)

No

 [Go to 26.](#)

26. CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE CONNECTOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from the purge control solenoid valve.
3. Turn the ignition switch to ON.
4. Measure the voltage between purge control solenoid valve connector and engine ground.

Connector & terminal

(E4) No. 1 (+) — Engine ground (—):

Is the voltage 10 V or more?

Yes

 [Go to 27.](#)

No

Repair the power supply circuit.

27. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE CONNECTOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and purge control solenoid valve connector.

Connector & terminal

(B135) No. 51 — (E4) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 28.](#)

No

Repair the open circuit in harness between ECM connector and purge control solenoid valve connector.

28. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE CONNECTOR.




Measure the resistance between the purge control solenoid valve connector and engine ground.

Connector & terminal

(E4) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 29.](#)

No

Repair the ground short circuit of harness between ECM connector and purge control solenoid valve 1 connector.

29. CHECK FOR POOR CONTACT.




Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes

Repair the poor contact of ECM connector.

No


Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Engine Control Module \(ECM\).](#)

30. CHECK OF FUEL PUMP.



1. On the item [Active Test], select [Fuel Pump Control (ON/OFF Dr.)] and perform ON/OFF drive.


Note:

For detailed operation procedures, refer to the "Active Test".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Active Test.](#)


2. Check if operating sound occurs in the fuel pump according to ON/OFF switching operation.

Does the fuel pump emit operating sound?

Yes

 [Go to 32.](#)

No


 [Go to 31.](#)

31. CHECK OF FUEL PUMP.


Check fuel pump.

Is the fuel pump normal?

Yes

Check fuel pump system.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Pump.](#)

No

Replace the fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Pump.](#)

32. CHECK FUEL TANK.

Check if any foreign matters such as iron powder exist in the fuel tank.

Is there any foreign matter in the fuel tank?

Yes

Remove foreign matter from the fuel tank.

No

 [Go to 33.](#)

33. CHECK FUEL PRESSURE.

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.


Measure the fuel pressure.  [Ref. to MECHANICAL\(H4DO\)>Fuel Pressure>INSPECTION.](#)

Caution:



Before attaching/detaching a fuel pressure gauge, release the fuel pressure.

Is the measured value 334 — 400 kPa (3.4 — 4.1 kgf/cm², 48 — 58 psi)?


Yes

 [Go to 34.](#)

No


Check the fuel pump and fuel delivery line.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Pump.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Delivery and Evaporation Lines.](#)

34. CHECK IGNITION SYSTEM.

Check the ignition system.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostics for Engine Starting Failure>IGNITION CONTROL SYSTEM.](#)

Is the ignition system normal?


Yes

 [Go to 35.](#)


No

Repair the ignition system.  [Ref. to IGNITION\(H4DO\)>General Description.](#)

35. CHECK FREEZE FRAME DATA.


Using the Subaru Select Monitor, read the value of [Calculated LOAD Value], then compare it with the reference value of [Calculated LOAD Value] listed in "Data Monitor" under "Subaru Select Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Note:


- **The value of [Calculated LOAD Value] change depending on how the engine internal parts settle in. If the value is out of standard, judge it again by comparing the vehicle with another one with the same specifications and similar conditions such as travel distance.**
- **For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)**

Is the value of [Calculated LOAD Value] 110% or more of the value described in the list?

Yes


 [Go to 36.](#)

No

 [Go to 40.](#)


36. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.




Check the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor>INSPECTION.](#)

Is the mass air flow and intake air temperature sensor normal?

Yes

 [Go to 37.](#)

No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

37. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the mass air flow and intake air temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and the mass air flow and intake air temperature sensor connector.


Connector & terminal

(B134) No. 16 — (B3) No. 5:

(B134) No. 17 — (B3) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 38.](#)

No

Repair the open circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

38. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.



Measure the resistance between the ECM connector and engine ground.


Connector & terminal

(B134) No. 16 — Engine ground:

(B134) No. 17 — Engine ground:

Is the resistance 1 MΩ or more?


Yes

 [Go to 39.](#)


No

Repair the ground short circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

39. CHECK DATA MONITOR.


1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor, read the value of [Calculated LOAD Value], then compare it with the reference value of [Calculated LOAD Value] listed under [Data monitor] in Subaru Select Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Note:


- **The value of [Calculated LOAD Value] change depending on how the engine internal parts settle in. If the value is out of standard, judge it again by comparing the vehicle with another one with the same specifications and similar conditions such as travel distance.**
- **For detailed operation procedures, refer to the "Data Monitor".**  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Does the value of [Calculated LOAD Value] fall between 90 — 110% of the value described in the list?

Yes

 [Go to 40.](#)

No


Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

40. CHECK DATA MONITOR.

1. Start the engine and warm up completely.
2. Raise the engine speed up to 2,500 rpm and maintain it for approx. three minutes.
3. Release the accelerator pedal and idle the engine.
4. Select [Injection Quantity Control] in [Active Test], and read the value of [A/F Sensor #1] at the increase rate of both 12% and –12%.


Note:

- **Perform the operation immediately after the engine comes into idling condition, otherwise the front oxygen (A/F) sensor will be cooled.**


- For detailed operation procedures, refer to the "Active Test".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Active Test.](#)

Does the value of [A/F Sensor #1] change to less than 0.88 at the increase rate of 12%, and to 1.12 or more at the rate of -12%?

Yes

 [Go to 45.](#)


No

 [Go to 41.](#)

41. CHECK FREEZE FRAME DATA.


Using the Subaru Select Monitor, read the value in [A/F Sensor #1 Resistance].

Note:


For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [A/F Sensor #1 Resistance] 500 Ω or more?

Yes

Replace the front oxygen (A/F) sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Front Oxygen \(A/F\) Sensor.](#)

No

 [Go to 42.](#)

42. CHECK POWER SUPPLY TO FRONT OXYGEN (A/F) SENSOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between front oxygen (A/F) sensor connector and engine ground.

Connector & terminal

(E24) No. 2 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 43.](#)

No

Repair the power supply line.

Note:

In this case, repair the following item:

- Open circuit in harness between A/F, oxygen sensor relay and front oxygen (A/F) sensor connector
- Poor contact of A/F, oxygen sensor relay connector
- Poor contact of coupling connector
- Malfunction of A/F, oxygen sensor relay

43. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

Connector & terminal


(B135) No. 5 — (E24) No. 1:

(B135) No. 33 — (E24) No. 4:

(B135) No. 46 — (E24) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 44.](#)

No

Repair the open circuit of harness between ECM connector and front oxygen (A/F) sensor connector.

44. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

Measure the resistance between the ECM connector and engine ground.

Connector & terminal


(B135) No. 5 — Engine ground:

(B135) No. 33 — Engine ground:

(B135) No. 46 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 45.](#)


No

Repair the short circuit to ground in harness between ECM connector and front oxygen (A/F) sensor connector.

45. CHECK FREEZE FRAME DATA.


Using the Subaru Select Monitor, read the values in [Coolant Temp.] and [Ambient air temperature].

Note:


For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [Coolant Temp.] 120°C (248°F) or more? Or is the value of [Coolant Temp.] lower than that of [Ambient air temperature] by 15°C (27°F) or more?


Yes

 [Go to 46.](#)

No


Clear memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)

46. CHECK ENGINE COOLANT TEMPERATURE SENSOR.


Check the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Engine Coolant Temperature Sensor>INSPECTION.](#)

Is the engine coolant temperature sensor normal?

Yes

 [Go to 47.](#)

No

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Coolant Temperature Sensor.](#)

47. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the engine coolant temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and engine coolant temperature sensor connector.


Connector & terminal

(B135) No. 34 — (E8) No. 1:

(B135) No. 43 — (E8) No. 2:

Is the resistance less than 1 Ω?

Yes

 [Go to 48.](#)

No

Repair the open circuit of the harness between the ECM connector and engine coolant temperature sensor connector.

48. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.

Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(B135) No. 43 — Engine ground:

(B135) No. 34 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

Even if DTC is detected, it has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.


Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No


Repair the short circuit to ground in harness between ECM connector and engine coolant temperature sensor connector.

49. CHECK IGNITION SYSTEM.

Check the ignition system.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostics for Engine Starting Failure>IGNITION CONTROL SYSTEM.](#)

Is the ignition system normal?

Yes

 [Go to 50.](#)


No

Repair the ignition system.  [Ref. to IGNITION\(H4DO\)>General Description.](#)

50. CHECK FREEZE FRAME DATA.


1. Using the Subaru Select Monitor, read the values of [FFD] in [Idle Mass Air Flow Feedback correct], [ISC Learning Value] and [Idle dirty throttle correct].

Note:

For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

2. Obtain the sum values of [Idle Mass Air Flow Feedback correct], [ISC Learning Value] and [Idle dirty throttle correct].
3. Start the engine and warm up completely.
4. Using the Subaru Select Monitor, read the values of data monitor in [Idle Mass Air Flow Feedback correct], [ISC Learning Value] and [Idle dirty throttle correct] during normal idling.


Note:

For detailed operation procedures, refer to the "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)


5. Obtain the sum values of [Idle Mass Air Flow Feedback correct], [ISC Learning Value] and [Idle dirty throttle correct].

Is the sum value of freeze frame data less than 80% of the sum value of current data?

Yes

 [Go to 51.](#)

No


 [Go to 53.](#)

51. CHECK AIR INTAKE SYSTEM.


Check the installing condition of the air intake system.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes




Repair the air intake system.  [Ref. to INTAKE \(INDUCTION\) \(H4DO\)>General Description.](#)



No

 [Go to 52.](#)

52. CHECK AIR INTAKE SYSTEM.


Check the air intake system related parts.

- Brake booster:  [Ref. to BRAKE>Brake Booster>INSPECTION.](#)
- Mass air flow and intake air temperature sensor:  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#)
- PCV hose:  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\) \(H4DO\)>PCV Hose.](#)

- PCV valve:  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\) \(H4DO\)>PCV Valve.](#)
- Purge control solenoid valve:  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Purge Control Solenoid Valve.](#)

Are all of the air intake system related parts normal?

Yes

 [Go to 62.](#)


No

Replace the parts if defective.

53. CHECK FREEZE FRAME DATA.

1. Using the Subaru Select Monitor, read the values in [VVT Adv. Ang. Amount R], [VVT Advance Target Angle Amount R], [VVT Adv. Ang. Amount L] and [VVT Advance Target Angle Amount L].


Note:

For detailed operation procedures, refer to “Freeze Frame Data”.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

2. Using the Subaru Select Monitor, compare the values between [VVT Adv. Ang. Amount R] and [VVT Advance Target Angle Amount R], and between [VVT Adv. Ang. Amount L] and [VVT Advance Target Angle Amount L].



Does all of the advance angle amount and retard angle amount synchronize with their target values?

Yes

 [Go to 62.](#)

No

Diagnose the part that does not synchronize.

- Intake RH:  [Go to 54.](#)
- Intake LH:  [Go to 58.](#)

54. CHECK POWER SUPPLY TO THE INTAKE OIL CONTROL SOLENOID RH.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake oil control solenoid RH.
3. Turn the ignition switch to ON.
4. Measure the voltage between intake oil control solenoid RH connector and engine ground.

Connector & terminal

(E38) No. 1 (+) — Engine ground (—):

Is the voltage 10 V or more?

Yes

 [Go to 55.](#)

No

Repair the power supply circuit.

55. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and intake oil control solenoid RH.

Connector & terminal

(B135) No. 20 — (E38) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 56.](#)

No

Repair the open circuit in harness between ECM connector and intake oil control solenoid RH connector.

56. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH CONNECTOR.


Measure the resistance between intake oil control solenoid RH connector and engine ground.

Connector & terminal

(E38) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 57.](#)

No


Repair the short circuit to ground in harness between ECM connector and intake oil control solenoid RH connector.

57. CHECK INTAKE OIL CONTROL SOLENOID RH.


Check the intake oil control solenoid RH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Oil Control Solenoid>INSPECTION.](#)

Is the intake oil control solenoid RH normal?

Yes

Replace the intake cam sprocket RH.  [Ref. to MECHANICAL\(H4DO\)>Cam Sprocket.](#)

No

Replace the intake oil control solenoid RH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Oil Control Solenoid.](#)

58. CHECK POWER SUPPLY TO THE INTAKE OIL CONTROL SOLENOID LH.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake oil control solenoid LH.
3. Turn the ignition switch to ON.
4. Measure the voltage between intake oil control solenoid LH connector and engine ground.

Connector & terminal

(E37) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 59.](#)

No

Repair the power supply circuit.

59. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and intake oil control solenoid LH.

Connector & terminal

(B135) No. 6 — (E37) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 60.](#)

No

Repair the open circuit in harness between ECM connector and intake oil control solenoid LH connector.

60. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH CONNECTOR.


Measure the resistance between intake oil control solenoid LH connector and engine ground.

Connector & terminal

(E37) No. 2 – Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 61.](#)

No


Repair the short circuit to ground in harness between ECM connector and intake oil control solenoid LH connector.

61. CHECK INTAKE OIL CONTROL SOLENOID LH.


Check the intake oil control solenoid LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Oil Control Solenoid>INSPECTION.](#)

Is the intake oil control solenoid LH normal?


Yes

Replace the intake cam sprocket LH.  [Ref. to MECHANICAL\(H4DO\)>Cam Sprocket.](#)

No


Replace the intake oil control solenoid LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Oil Control Solenoid.](#)

62. CHECK ENGINE COOLANT TEMPERATURE SENSOR.


Check the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Engine Coolant Temperature Sensor>INSPECTION.](#)

Is the engine coolant temperature sensor normal?

Yes

 [Go to 63.](#)

No

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Coolant Temperature Sensor.](#)

63. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the engine coolant temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and engine coolant temperature sensor connector.


Connector & terminal

(B135) No. 34 — (E8) No. 1:

(B135) No. 43 — (E8) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 64.](#)

No

Repair the open circuit of the harness between the ECM connector and engine coolant temperature sensor connector.

64. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.



Measure the resistance between the ECM connector and engine ground.


Connector & terminal

(B135) No. 43 — Engine ground:

(B135) No. 34 — Engine ground:

Is the resistance 1 M Ω or more?

Yes


 [Go to 65.](#)

No

Repair the short circuit to ground in harness between ECM connector and engine coolant temperature sensor connector.


65. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.




Check the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor>INSPECTION.](#)

Is the mass air flow and intake air temperature sensor normal?


Yes

 [Go to 66.](#)

No


Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

66. CHECK MANIFOLD ABSOLUTE PRESSURE SENSOR.



Check the manifold absolute pressure sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Manifold Absolute Pressure Sensor>INSPECTION.](#)

Is the manifold absolute pressure sensor normal?

Yes

Clear the memory to complete.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)

No

Check the manifold absolute pressure sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Manifold Absolute Pressure Sensor.](#)  [Go to 67.](#)

67. CHECK POWER SUPPLY CIRCUIT OF FUEL INJECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector.
3. Turn the ignition switch to ON.
4. Measure the voltage between fuel injector connector and the engine ground.

Connector & terminal

- (E5) No. 2 (+) — Engine ground (–):
- (E16) No. 2 (+) — Engine ground (–):
- (E6) No. 2 (+) — Engine ground (–):
- (E17) No. 2 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 68.](#)

No

Repair the power supply circuit.

68. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and fuel injector connector.

Connector & terminal

- #1 (B135) No. 23 — (E5) No. 1:
- #2 (B135) No. 8 — (E16) No. 1:
- #3 (B135) No. 9 — (E6) No. 1:
- #4 (B135) No. 22 — (E17) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 69.](#)

No

Repair the open circuit of the harness between the ECM connector and fuel injector connector.

69. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.




Measure the resistance between the ECM connector and engine ground.

Connector & terminal

- #1 (B135) No. 23 — Engine ground:
- #2 (B135) No. 8 — Engine ground:
- #3 (B135) No. 9 — Engine ground:
- #4 (B135) No. 22 — Engine ground:

Is the resistance 1 M Ω or more?

Yes


 [Go to 70.](#)

No

Repair the short circuit to ground in harness between ECM connector and fuel injector connector.


70. CHECK IGNITION SYSTEM.




Check the ignition system.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostics for Engine Starting Failure>IGNITION CONTROL SYSTEM.](#)

Is the ignition system normal?

Yes

 [Go to 71.](#)


No

Repair the ignition system.  [Ref. to IGNITION\(H4DO\)>General Description.](#)

71. CHECK FREEZE FRAME DATA.


Using the Subaru Select Monitor, read the value in [A/C Compressor Signal].

Note:


For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Does the value of [A/C Compressor Signal] indicate ON output?

Yes

 [Go to 72.](#)


No

 [Go to 73.](#)

72. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the value in [Idle A/C load correct].

Note:

For detailed operation procedures, refer to Freeze Frame Data.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Has the value of [Idle A/C load correct] increased?

Yes

Check the air conditioner.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)


No

 [Go to 73.](#)

73. CHECK FREEZE FRAME DATA.


1. Using the Subaru Select Monitor, read the value in [Electric Load Feedback Val].

Note:

For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)



2. Compare the value of [Electric Load Feedback Val] with that of [Idle Mass Air Flow], listed under the data monitor.

Note:


For detailed operation procedures, refer to the "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Is the value of [Electric Load Feedback Val] 20% or more to the value of [Idle Mass Air Flow]?

Yes

Check the generator and power assisted system.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Generator.](#)  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)


No

 [Go to 74.](#)

74. CHECK FREEZE FRAME DATA.


1. Using the Subaru Select Monitor, read the values in [Vehicle Speed Sensor], [Engine Speed] and [AT turbine speed].

Note:


For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is there any freeze frame data indicating that the value of [Vehicle Speed Sensor] is less than 6 km/h (18.6 MPH), and that the difference in values between [Engine Speed] and [AT turbine speed] is less than 100 rpm?


Yes

Repair the CVT.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>General Description.](#)


No

 [Go to 75.](#)

75. CHECK DTC.

Is DTC of CVT displayed?  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Even if DTC is detected, it has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.


Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.


76. CHECK FREEZE FRAME DATA.


Using the Subaru Select Monitor, read the values in [Calculated LOAD Value] and [Relative Throttle Position].

Note:


For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [Calculated LOAD Value] decreasing while that of [Relative Throttle Position] is increasing?


 [Go to 77.](#)


 [Go to 82.](#)

77. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

Check the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor>INSPECTION.](#)

Is the mass air flow and intake air temperature sensor normal?

 [Go to 78.](#)

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

78. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the mass air flow and intake air temperature sensor.
3. Disconnect the connector from ECM.

- 4.** Measure the resistance of harness between ECM connector and the mass air flow and intake air temperature sensor connector.


Connector & terminal

(B134) No. 16 — (B3) No. 5:

(B134) No. 17 — (B3) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 79.](#)

No

Repair the open circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

79. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.



Measure the resistance between the ECM connector and engine ground.


Connector & terminal

(B134) No. 16 — Engine ground:

(B134) No. 17 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 80.](#)

No


Repair the ground short circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

80. CHECK DATA MONITOR.




1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor, read the value of [Calculated LOAD Value], then compare it with the reference value of [Calculated LOAD Value] listed under [Data monitor] in Subaru Select Monitor.

Note:


- **The value of [Calculated LOAD Value] change depending on how the engine internal parts settle in. If the value is out of standard, judge it again by comparing the vehicle with another one with the same specifications and similar conditions such as travel distance.**
- **For detailed operation procedures, refer to the "Data Monitor".**  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Does the value of [Calculated LOAD Value] fall between 90 — 110% of the value described in the list?

Yes

 [Go to 81.](#)

No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

81. CHECK POWER SUPPLY CIRCUIT OF FUEL INJECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector.
3. Turn the ignition switch to ON.
4. Measure the voltage between fuel injector connector and the engine ground.

Connector & terminal

- (E5) No. 2 (+) — Engine ground (-):
- (E16) No. 2 (+) — Engine ground (-):
- (E6) No. 2 (+) — Engine ground (-):
- (E17) No. 2 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 82.](#)

No

Repair the power supply circuit.

82. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and fuel injector connector.

Connector & terminal

- #1 (B135) No. 23 — (E5) No. 1:
- #2 (B135) No. 8 — (E16) No. 1:
- #3 (B135) No. 9 — (E6) No. 1:
- #4 (B135) No. 22 — (E17) No. 1:

Is the resistance less than 1 Ω?

Yes

 [Go to 83.](#)

No

Repair the open circuit of the harness between the ECM connector and fuel injector connector.

83. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.



Measure the resistance between the ECM connector and engine ground.

Connector & terminal

#1 (B135) No. 23 — Engine ground:

#2 (B135) No. 8 — Engine ground:

#3 (B135) No. 9 — Engine ground:

#4 (B135) No. 22 — Engine ground:

Is the resistance 1 MΩ or more?

Yes


 [Go to 84.](#)

No

Repair the short circuit to ground in harness between ECM connector and fuel injector connector.


84. CHECK IGNITION SYSTEM.



Check the ignition system.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostics for Engine Starting Failure>IGNITION CONTROL SYSTEM.](#)

Is the ignition system normal?

Yes

 [Go to 85.](#)

No


Repair the ignition system.  [Ref. to IGNITION\(H4DO\)>General Description.](#)

85. CHECK OF FUEL PUMP.



1. On the item [Active Test], select [Fuel Pump Control (ON/OFF Dr.)] and perform ON/OFF drive.


Note:

For detailed operation procedures, refer to the "Active Test".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Active Test.](#)


2. Check if operating sound occurs in the fuel pump according to ON/OFF switching operation.

Does the fuel pump emit operating sound?

Yes


 [Go to 87.](#)

No

 [Go to 86.](#)


86. CHECK OF FUEL PUMP.




Check fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Pump>INSPECTION.](#)

Is the fuel pump normal?

Yes

Check fuel pump system.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Pump>INSPECTION.](#)

No

Replace the fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Pump.](#)

87. CHECK FUEL TANK.




Check if any foreign matters such as iron powder exist in the fuel tank.

Is there any foreign matter in the fuel tank?

Yes

Remove foreign matter from the fuel tank.

No

 [Go to 88.](#)

88. CHECK FUEL PRESSURE.



Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.


Measure the fuel pressure.  [Ref. to MECHANICAL\(H4DO\)>Fuel Pressure>INSPECTION.](#)

Caution:



Before attaching/detaching a fuel pressure gauge, release the fuel pressure.

Is the measured value 334 — 400 kPa (3.4 — 4.1 kgf/cm², 48 — 58 psi)?

Yes

 [Go to 89.](#)

No

Check the fuel pump and fuel delivery line.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Pump>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Delivery and Evaporation Lines>INSPECTION.](#)

89. CHECK ENGINE RUNNING CONDITION.


Check the engine running condition using the cylinder monitor for the respective cylinders in the Subaru Select Monitor.

Note:


For detailed operation procedures, refer to "Application help".

Is there a large difference in the speed between each cylinder?

Yes

It is possible that the compression pressure of the engine is not sufficient. Check the engine.  [Ref. to MECHANICAL\(H4DO\)>Symptoms and causes>INSPECTION.](#)

No

Clear the memory to complete.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Clear Memory Mode.](#)

1. OUTLINE OF DIAGNOSIS

Judge as NG when the engine stops except by operating the ignition switch after starting the engine.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Engine condition	After engine starting

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
----------------------	-----------------

Engine speed	≤ 300 rpm
--------------	----------------

Time needed for diagnosis: 48 ms

Malfunction indicator light illumination: Does not illuminate.


ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1604 STARTABILITY MALFUNCTION

DTC detecting condition:

Immediately at fault recognition

Caution:

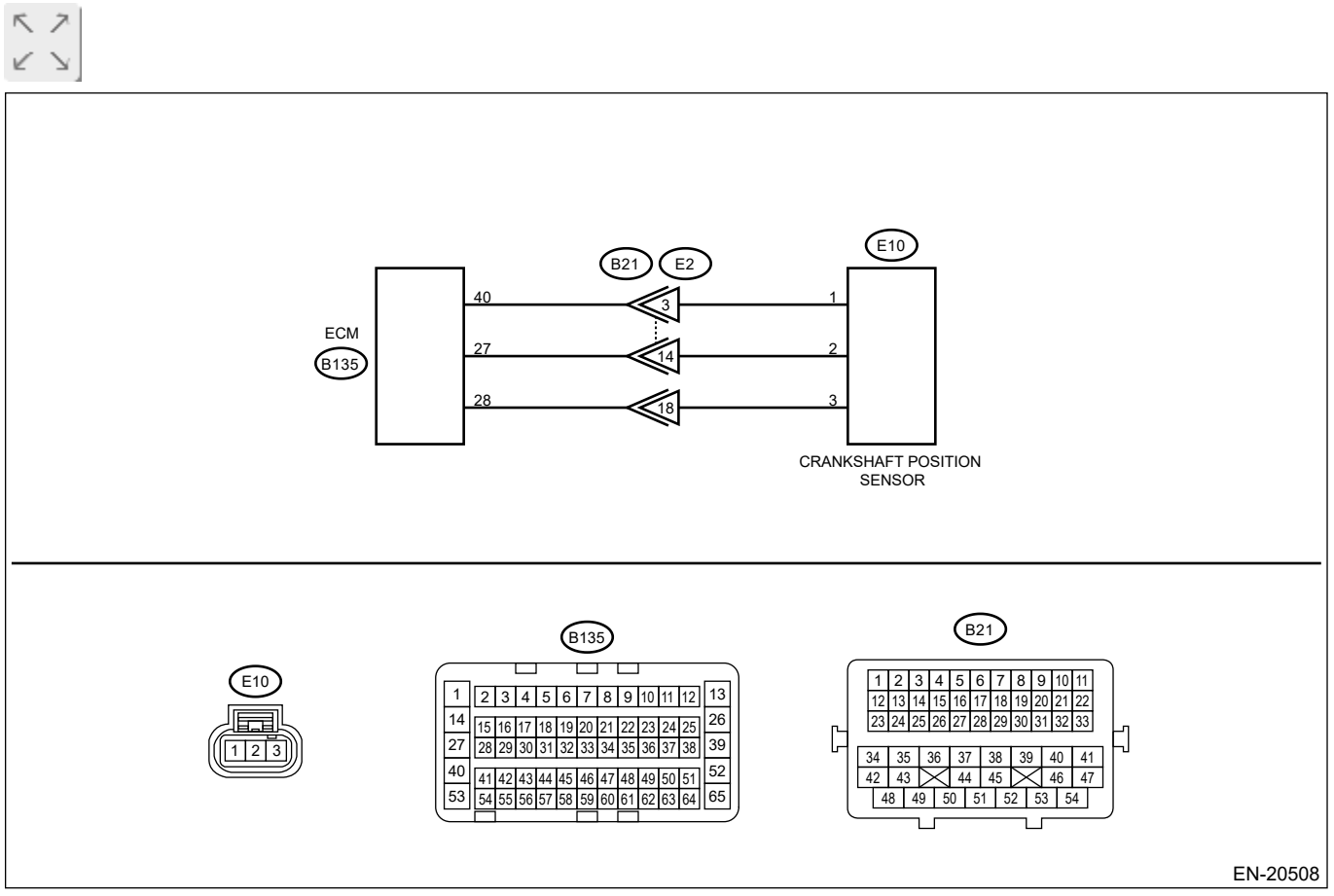
- After servicing or replacing faulty parts, clear the memory.  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode.
- Use the check board when measuring the ECM terminal voltage and resistance.

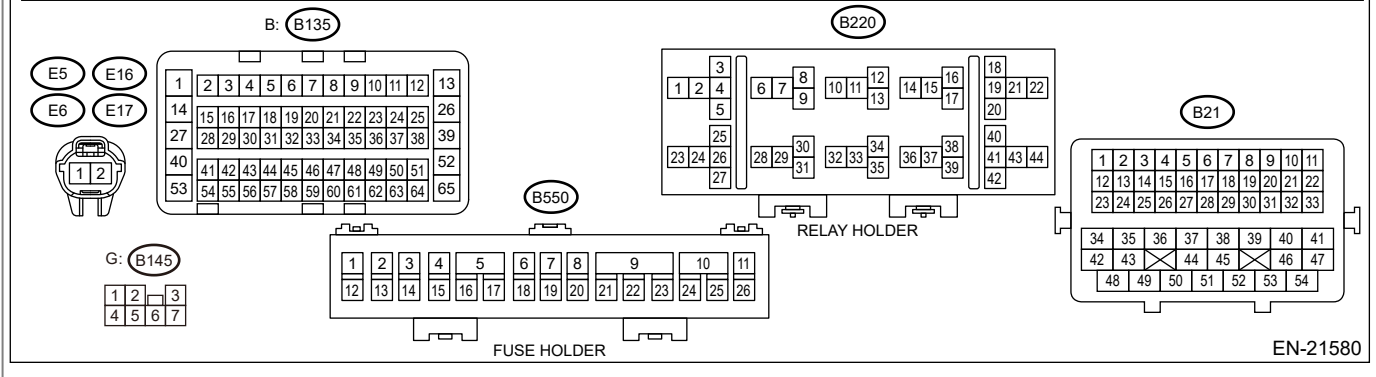
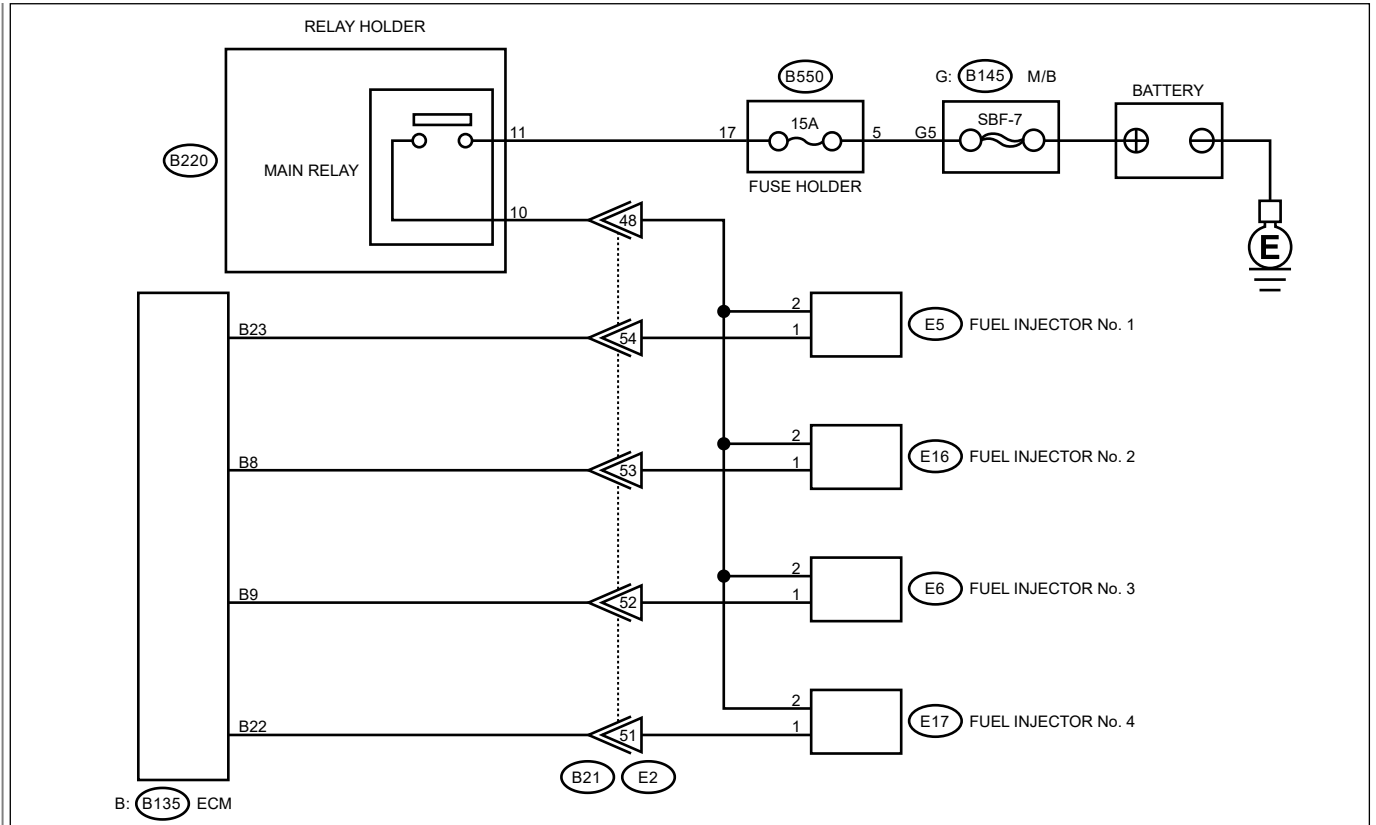
Note:

This DTC may be detected even if fault does not occur in the vehicle. If the customer does not ask for inspection, clear memory instead of inspection and return the vehicle to the user.

Wiring diagram:

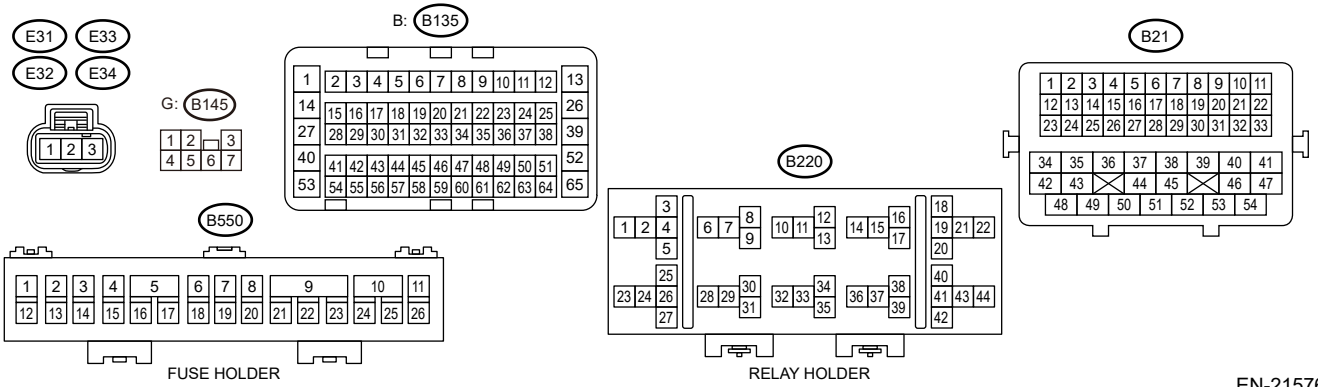
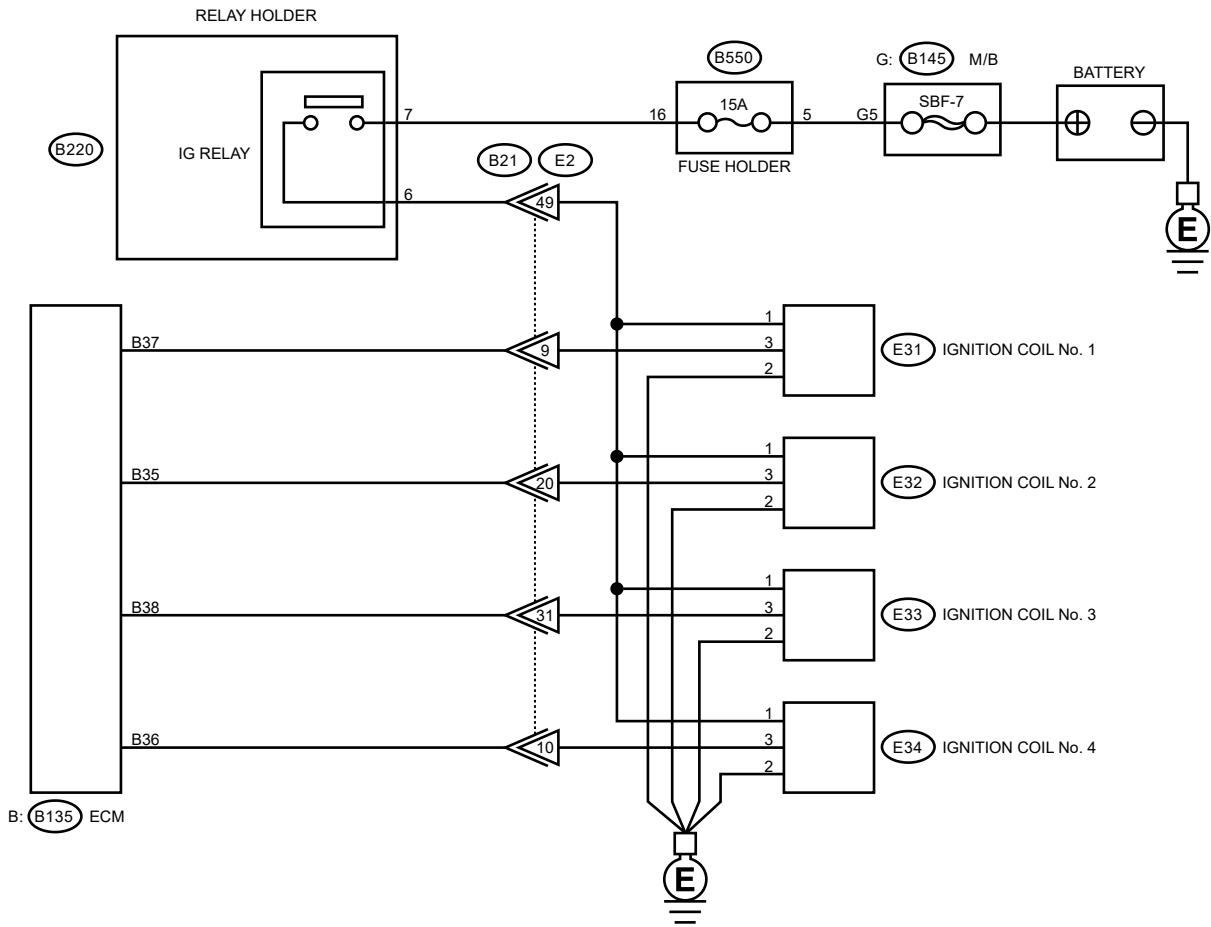
Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





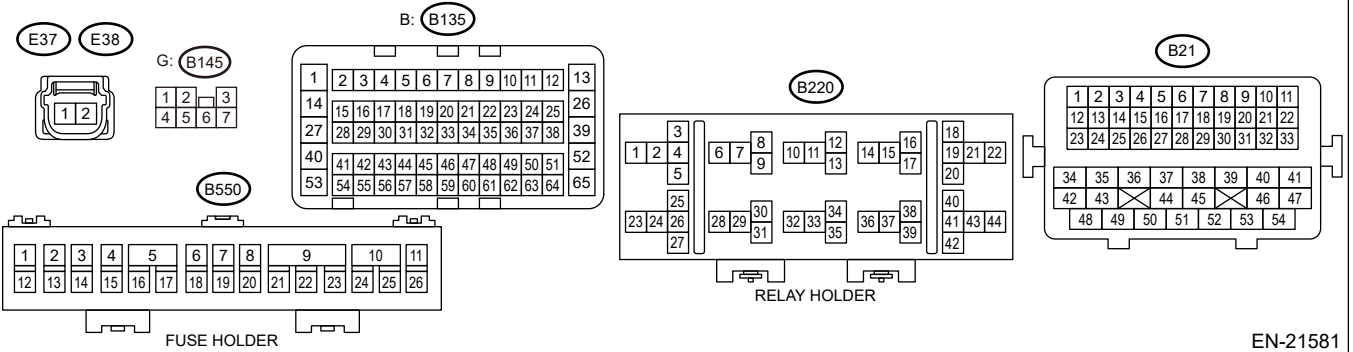
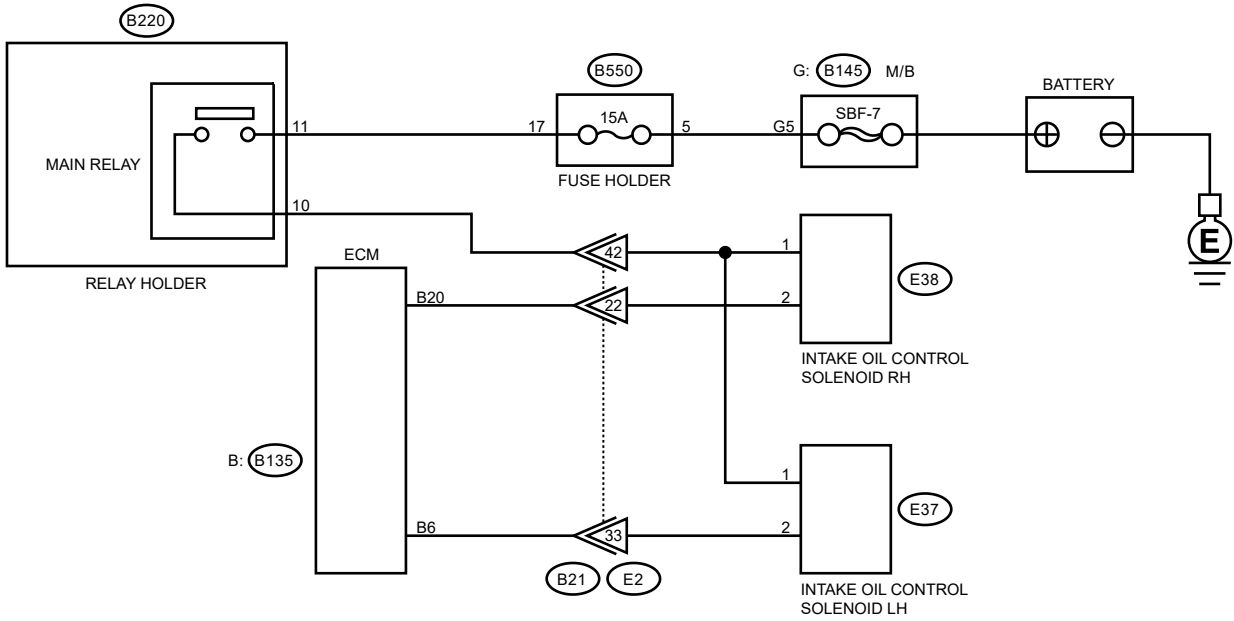
EN-21580





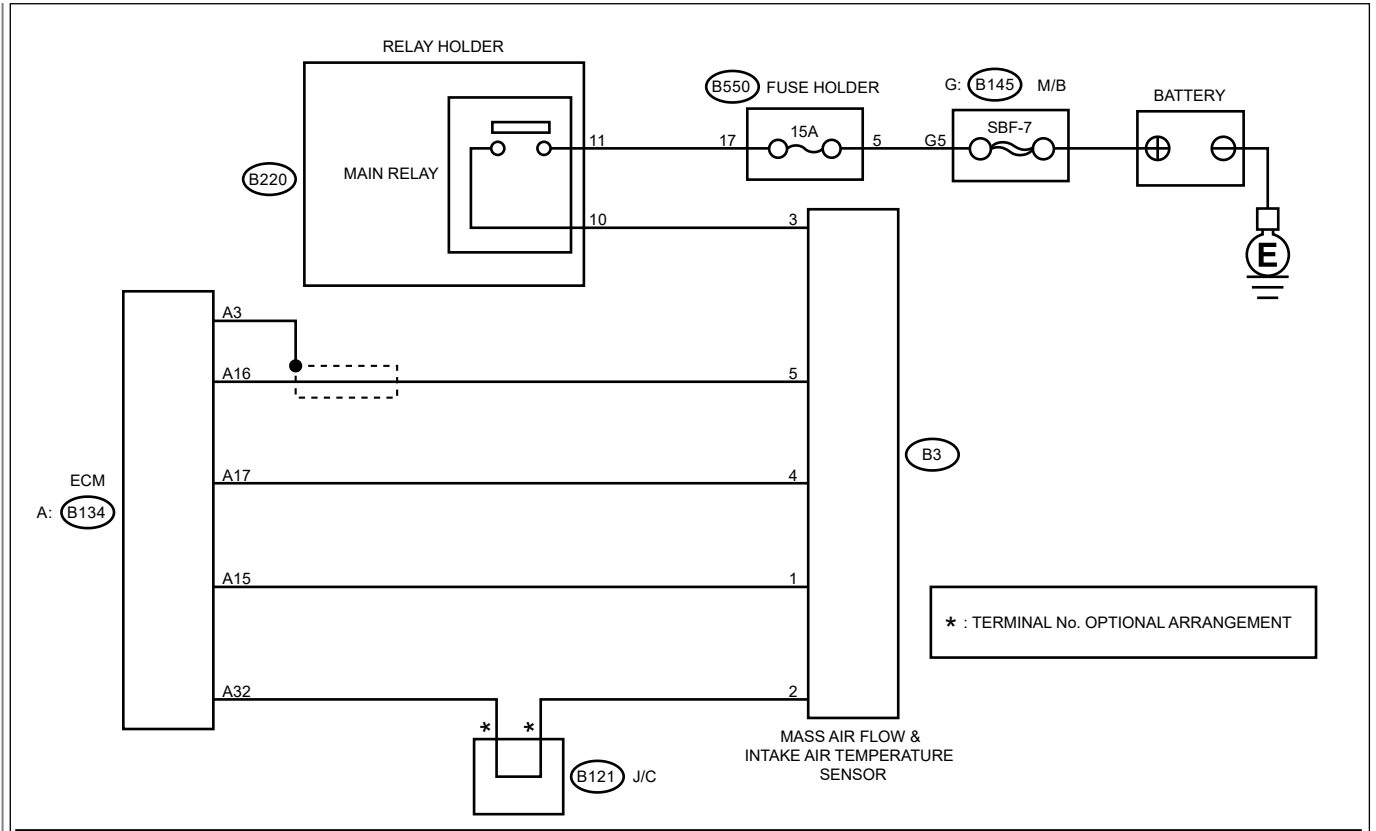
EN-21576



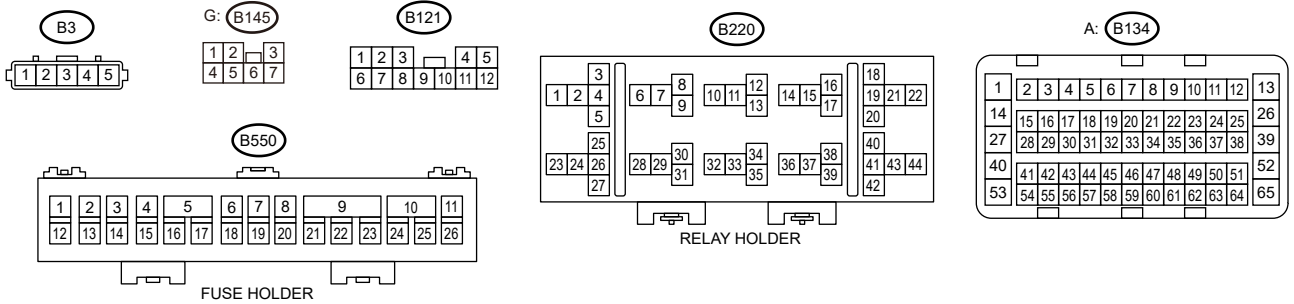


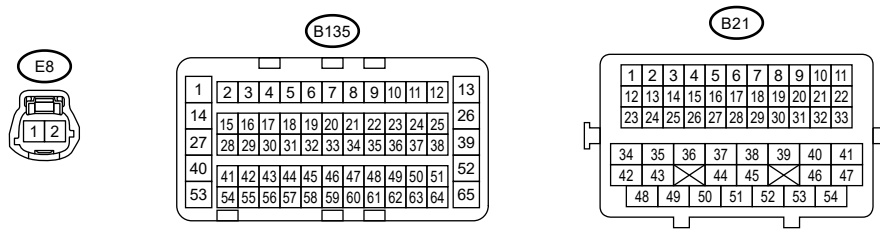
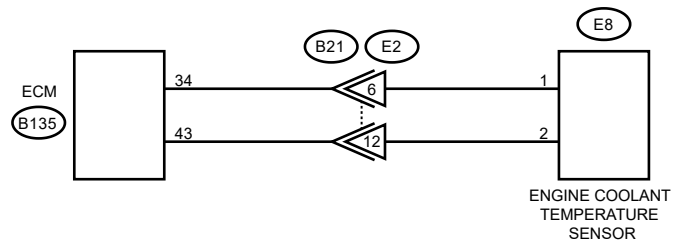
EN-21581





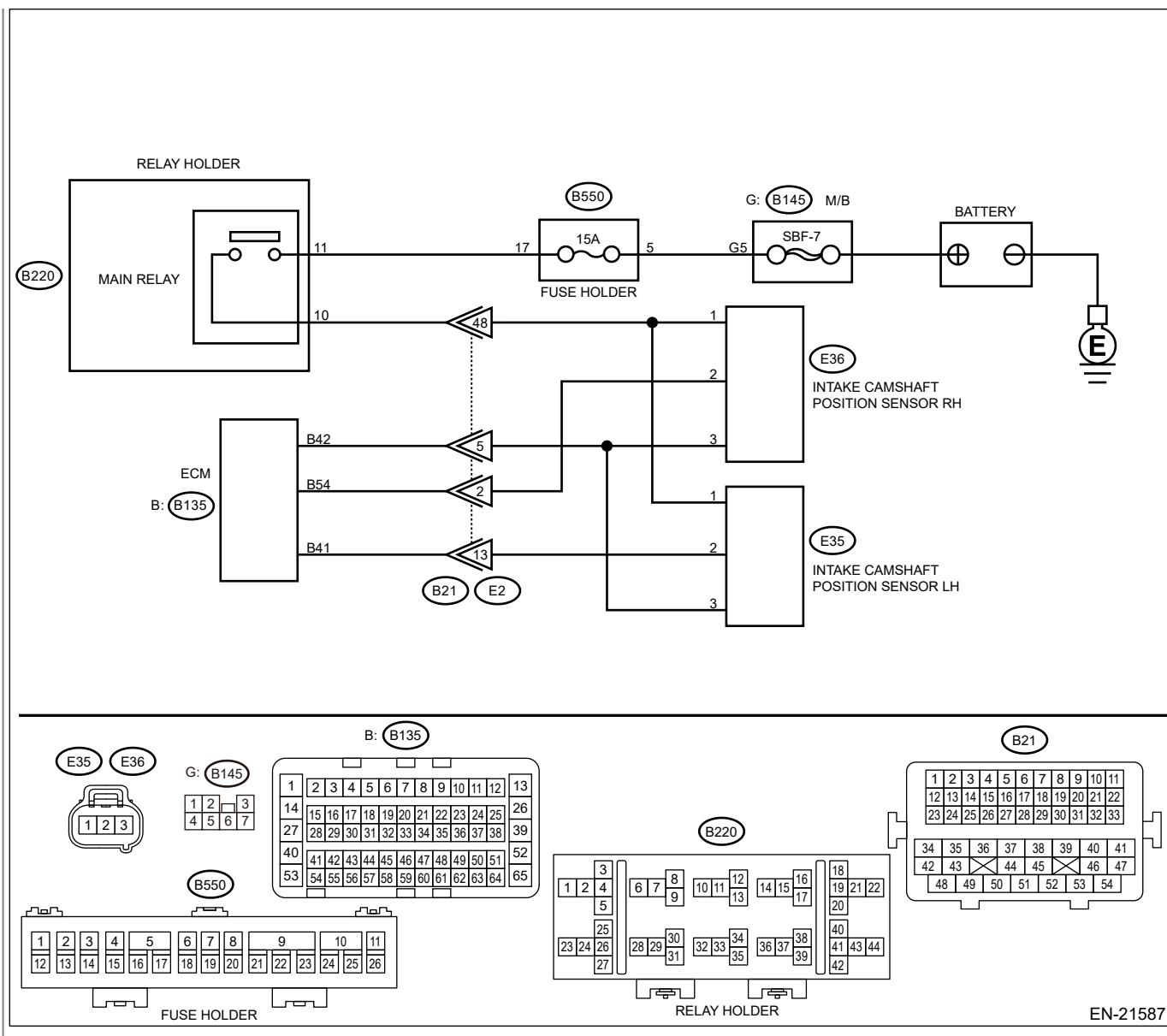
* : TERMINAL No. OPTIONAL ARRANGEMENT





EN-20504





1. CHECK DTC.

Is any other DTC displayed?


Yes

Check DTC using "List of Diagnostic Trouble Code (DTC)". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


[Go to 2.](#)

2. CHECK IMMOBILIZER.


Check the immobilizer.  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is the immobilizer normal?

Yes

 [Go to 3.](#)


No

Repair the immobilizer.  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

3. CHECK FOR MALFUNCTION OCCURRENCE.

Is it possible to reproduce the faulty phenomenon or to identify the faulty condition?

Yes

 [Go to 28.](#)


No

 [Go to 4.](#)

4. CHECK FREEZE FRAME DATA.



Using the Subaru Select Monitor, read the values in [Engine Speed] and [Control module voltage].

Note:



For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [Engine Speed] 0 rpm?

Yes

- When the value of [Control module voltage] is less than 5 V: Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery>INSPECTION.](#)
- When the value of [Control module voltage] is 5 V or more:  [Go to 5.](#)


No

- When the value of [Engine Speed] is less than 250 rpm:  [Go to 11.](#)
- When the value of [Engine Speed] is 250 rpm or more:  [Go to 18.](#)

5. CHECK FREEZE FRAME DATA.


Using the Subaru Select Monitor, read the value in [Control module voltage].

Note:



- For detailed operation procedures, refer to “Freeze Frame Data”.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)
- ECM power voltage drops temporarily at cranking.

Is the value of [Control module voltage] less than 9 V?

Yes

It is possible that the engine friction is too large. Check the engine.  [Ref. to MECHANICAL\(H4DO\)>Symptoms and causes>INSPECTION.](#)


No

- When the value of [Control module voltage] changes in any one of freeze frame data:  [Go to 6.](#)
- When the value of [Control module voltage] does not change in all freeze frame data: Check the starter motor circuit.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostics for Engine Starting Failure>STARTER MOTOR CIRCUIT.](#)


6. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.

Is the crankshaft position sensor installed correctly?

Yes

 [Go to 7.](#)

No

Install the crankshaft position sensor correctly.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Crankshaft Position Sensor>INSTALLATION.](#)

7. CHECK CRANKSHAFT POSITION SENSOR.


Check the crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Crankshaft Position Sensor>INSPECTION.](#)

Is the crankshaft position sensor normal?

Yes

 [Go to 8.](#)

No

Replace the crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Crankshaft Position Sensor.](#)

8. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and crankshaft position sensor connector.

Connector & terminal

(B135) No. 40 – (E10) No. 1:

(B135) No. 27 – (E10) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 9.](#)

No

Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.

9. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.

Measure the resistance between crankshaft position sensor connector and engine ground.


Connector & terminal

(E10) No. 1 – Engine ground:

(E10) No. 2 – Engine ground:

Is the resistance 1 M Ω or more?


Yes

 [Go to 10.](#)

No

Repair short circuit to ground in harness between ECM connector and crankshaft position sensor connector.

10. CHECK FOR MALFUNCTION OCCURRENCE.

1. Replace the crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DQ\)>Crankshaft Position Sensor.](#)
2. Check that the fault is removed.

Is the fault removed?

 Clear the memory to complete.  [Ref. to ENGINE \(DIAGNOSTICS\)](#)

Yes

[\(H4DO\)>Clear Memory Mode.](#)

No

Replace the ECM. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Engine Control Module \(ECM\).](#)

11. CHECK OF FUEL PUMP.

1. On the item [Active Test], select [Fuel Pump Control (ON/OFF Dr.)] and perform ON/OFF drive.

Note:

For detailed operation procedures, refer to the "Active Test". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Active Test.](#)

2. Check if operating sound occurs in the fuel pump according to ON/OFF switching operation.

Does the fuel pump emit operating sound?

Yes

[Go to 13.](#)

No

[Go to 12.](#)

12. CHECK OF FUEL PUMP.

Check fuel pump. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Pump>INSPECTION.](#)

Is the fuel pump normal?

Yes

Check fuel pump system. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Pump>INSPECTION.](#)

No

Replace the fuel pump. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Pump.](#)

13. CHECK FUEL TANK.


Check if any foreign matters such as iron powder exist in the fuel tank.

Is there any foreign matter in the fuel tank?

Yes

Remove foreign matter from the fuel tank.

No

 [Go to 14.](#)

14. CHECK FUEL PRESSURE.

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.


Measure the fuel pressure.  [Ref. to MECHANICAL\(H4DO\)>Fuel Pressure>INSPECTION.](#)

Caution:



Before attaching/detaching a fuel pressure gauge, release the fuel pressure.

Is the measured value 334 – 400 kPa (3.4 – 4.1 kgf/cm², 48 – 58 psi)?

Yes

 [Go to 15.](#)

No

Check the fuel pump and fuel delivery line.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Pump>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Delivery and Evaporation Lines>INSPECTION.](#)

15. CHECK POWER SUPPLY CIRCUIT OF FUEL INJECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector.
3. Turn the ignition switch to ON.
4. Measure the voltage between fuel injector connector and the engine ground.

Connector & terminal

- (E5) No. 2 (+) – Engine ground (-):
- (E16) No. 2 (+) – Engine ground (-):
- (E6) No. 2 (+) – Engine ground (-):
- (E17) No. 2 (+) – Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 16.](#)

No

Repair the power supply circuit.

16. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from fuel injector.
4. Measure the resistance of harness between ECM connector and fuel injector connector.

Connector & terminal

- #1 (B135) No. 23 — (E5) No. 1:
- #2 (B135) No. 8 — (E16) No. 1:
- #3 (B135) No. 9 — (E6) No. 1:
- #4 (B135) No. 22 — (E17) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 17.](#)

No

Repair the open circuit of the harness between the ECM connector and fuel injector connector.

17. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.




Measure the resistance between the ECM connector and engine ground.

Connector & terminal

- #1 (B135) No. 23 — Engine ground:
- #2 (B135) No. 8 — Engine ground:
- #3 (B135) No. 9 — Engine ground:
- #4 (B135) No. 22 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 27.](#)

No


Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

18. CHECK FREEZE FRAME DATA.




Using the Subaru Select Monitor, read the values in [Coolant Temp.], [Ambient air temperature] and [Engine Speed].

Note:



For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [Coolant Temp.] 120°C (248°F) or more? Or is the value of [Coolant Temp.] lower than that of [Ambient air temperature] by 15°C (27°F) or more?


Yes

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Coolant Temperature Sensor.](#)

No


- When the minimum value of [Engine Speed] is less than 300 rpm:  [Go to 19.](#)
- When the minimum value of [Engine Speed] is 300 rpm or more: It is possible that the engine compression pressure is not sufficient. Check the engine.  [Ref. to MECHANICAL\(H4DO\)>Symptoms and causes>INSPECTION.](#)

19. CHECK FUEL INJECTOR.


Check fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Injector>INSPECTION.](#)

Is there any deposit in the fuel injectors?

Yes

Replace the fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Injector.](#)

No

 [Go to 20.](#)

20. CHECK FUEL TANK.


Check if any foreign matters such as iron powder exist in the fuel tank.

Is there any foreign matter in the fuel tank?

Yes

Remove foreign matter from the fuel tank.


No

 [Go to 21.](#)

21. CHECK FREEZE FRAME DATA.


Using the Subaru Select Monitor, read the value in [Coolant Temp.].

Note:


For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [Coolant Temp.] 40 — 90°C (104 — 194°F)?

Yes

 [Go to 23.](#)

No

 [Go to 22.](#)


22. CHECK FUEL PRESSURE.

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.

Measure the fuel pressure five minutes after the engine is stopped.  [Ref. to MECHANICAL\(H4DO\)>Fuel Pressure>INSPECTION.](#)

Caution:


Before attaching/detaching a fuel pressure gauge, release the fuel pressure.

Note:


If the engine does not start, measure the fuel pressure five minutes after cranking is completed.

Is the measured value 147 kPa (1.5 kgf/cm², 21 psi) or more?

Yes

 [Go to 27.](#)

No

Replace the pressure regulator.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Filter.](#)


23. CHECK FUEL INJECTOR.

1. After the engine is stopped, scavenge inside of the intake manifold by applying compressed air.
2. Measure the HC concentration inside the intake manifold 15 minutes after scavenging is completed.
 - If HC concentration gauge is not available, go to the next step.


- For measuring HC concentration, remove the vacuum hose between intake manifold assembly and purge control solenoid valve to measure the HC concentration in the intake manifold assembly.

Is the HC concentration less than 4,000 ppm?

Yes


 [Go to 25.](#)

No

 [Go to 24.](#)


24. CHECK FUEL INJECTOR.




Check fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Injector>INSPECTION.](#)

Are fuel injectors OK?

Yes


 [Go to 25.](#)

No

Replace the fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Injector.](#)


25. CHECK THROTTLE BODY.




Check throttle body.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Throttle Body>INSPECTION.](#)

Is there any deposit in the throttle body?

Yes

Replace the throttle body.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Throttle Body.](#)

No

 [Go to 26.](#)

26. CHECK AIR INTAKE SYSTEM.



Check the installing condition of the air intake system.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes

Repair the air intake system.  [Ref. to INTAKE \(INDUCTION\).](#)

[\(H4DO\)>General Description.](#)

No

[Go to 27.](#)

27. CHECK FOR MALFUNCTION OCCURRENCE.

Is the fault removed?

Yes

Clear the memory to complete. [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Clear Memory Mode.](#)

No

[Go to 28.](#)

28. CHECK FOR MALFUNCTION OCCURRENCE.

Does cranking occur?

Yes

- When the engine speed is abnormal during cranking: [Go to 35.](#)
- When an initial combustion does not occur: [Go to 38.](#)
- When the engine stalls immediately after engine start: [Go to 56.](#)
- When the engine takes time to start: [Go to 70.](#)

No

[Go to 29.](#)

29. CHECK FOR MALFUNCTION OCCURRENCE.

Does the sound occur by a protruding starter pinion gear during cranking?

Yes

- When the starter motor does not rotate: [Go to 30.](#)
- When the starter motor rotates but does not engage: [Go to 32.](#)

No


[Go to 33.](#)

30. CHECK BATTERY.


Check the battery. [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery>INSPECTION.](#)

Is the battery OK?

Yes

 [Go to 31.](#)

No

Charge or replace the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)

31. CHECK ENGINE MAIN BODY.

Using the ST, rotate the crankshaft.


ST 18252AA000 CRANKSHAFT SOCKET

Does the crankshaft rotate smoothly?


Yes

Check the starter motor.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Starter>INSPECTION.](#)

Note:

It is possible that the engine friction increased temporarily. Check if any foreign matter is mixed in engine oil. If a foreign matter is found, check the engine.  [Ref. to MECHANICAL\(H4DO\)>Symptoms and causes>INSPECTION.](#)

No


It is possible that the engine friction is too large. Check the engine.  [Ref. to MECHANICAL\(H4DO\)>Symptoms and causes>INSPECTION.](#)

32. CHECK STARTER MOTOR.

Check the starter motor.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Starter>INSPECTION.](#)

Is there any wear or damage in the starter pinion gear?


Yes

Repair the starter motor.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Starter.](#)

No


Replace the torque converter assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Torque Converter Assembly.](#)

33. CHECK BATTERY.


Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery>INSPECTION.](#)

Is the battery OK?

Yes

 [Go to 34.](#)

No


Charge or replace the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)

34. CHECK STARTER MOTOR.

Check the starter motor.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Starter>INSPECTION.](#)

Is the starter motor OK?

Yes

Check the starter motor circuit.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostics for Engine Starting Failure>STARTER MOTOR CIRCUIT.](#)


No

Repair the starter motor.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Starter.](#)

35. CHECK DATA MONITOR.


Using the Subaru Select Monitor, read the value of [Engine Speed] during cranking.

Note:


For detailed operation procedures, refer to the "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Is the value of [Engine Speed] 300 rpm or more?


Yes

It is possible that the compression pressure of the engine is not sufficient. Check the engine.  [Ref. to MECHANICAL\(H4DO\)>Symptoms and causes.](#)

No


 [Go to 36.](#)

36. CHECK BATTERY.


Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery>INSPECTION.](#)

Is the battery OK?

Yes

 [Go to 37.](#)

No

Charge or replace the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)

37. CHECK ENGINE MAIN BODY.

Using the ST, rotate the crankshaft.


ST 18252AA000 CRANKSHAFT SOCKET

Does the crankshaft rotate smoothly?


Yes

Check the starter motor.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Starter>INSPECTION.](#)

Note:

It is possible that the engine friction increased temporarily. Check if any foreign matter is mixed in engine oil. If a foreign matter is found, check the engine.  [Ref. to MECHANICAL\(H4DO\)>Symptoms and causes>INSPECTION.](#)

No


It is possible that the engine friction is too large. Check the engine.  [Ref. to MECHANICAL\(H4DO\)>Symptoms and causes>INSPECTION.](#)

38. CHECK OPERATION OF EACH FUEL INJECTOR.


Using a sound scope, check each fuel injector for operation sound during cranking.

Does the fuel injector emit operating sound?

Yes

 [Go to 39.](#)

No

 [Go to 52.](#)

39. CHECK FUEL PRESSURE.

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.


Measure the fuel pressure.  [Ref. to MECHANICAL\(H4DO\)>Fuel Pressure>INSPECTION.](#)

Caution:


Before attaching/detaching a fuel pressure gauge, release the fuel pressure.

Is the measured value 334 – 400 kPa (3.4 – 4.1 kgf/cm², 48 – 58 psi)?


Yes

 [Go to 40.](#)

No

 [Go to 50.](#)

40. CHECK IGNITION CONDITION.


Check the ignition condition.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostics for Engine Starting Failure>IGNITION CONTROL SYSTEM.](#)

Is the ignition condition normal?

Yes

 [Go to 41.](#)

No


 [Go to 44.](#)

41. CHECK FOR MALFUNCTION OCCURRENCE.



Check for the condition of fault occurrence.

Does the fault occur only within approx. 15 to 120 minutes after the engine is stopped?

Yes

 [Go to 43.](#)

No

- When the fault occurs in two or three minutes or a long time after the engine is stopped:  [Go to 42.](#)
- When the fault occurrence pattern is inconsistent:  [Go to 83.](#)


42. CHECK FUEL PRESSURE.

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.

Measure the fuel pressure five minutes after the engine is stopped.  [Ref. to MECHANICAL\(H4DO\)>Fuel Pressure>INSPECTION.](#)

Caution:


Before attaching/detaching a fuel pressure gauge, release the fuel pressure.

Note:


If the engine does not start, measure the fuel pressure five minutes after cranking is completed.

Is the measured value 147 kPa (1.5 kgf/cm², 21 psi) or more?

Yes

 [Go to 83.](#)

No

Replace the pressure regulator.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Filter.](#)

43. CHECK FUEL INJECTOR.


1. After the engine is stopped, scavenge inside of the intake manifold by applying compressed air.
2. Measure the HC concentration inside the intake manifold 15 minutes after scavenging is completed.

Note:


- **If HC concentration gauge is not available, go to the next step.**
- **For measuring HC concentration, remove the vacuum hose between intake manifold assembly and purge control solenoid valve to measure the HC concentration in the intake manifold assembly.**

Is the HC concentration less than 4,000 ppm?

Yes

 [Go to 83.](#)

No


Replace the fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Injector.](#)

44. CHECK SPARK PLUG.


Check the spark plug.  [Ref. to IGNITION\(H4DO\)>Spark Plug>INSPECTION.](#)

Are the spark plugs normal?

Yes

 [Go to 45.](#)


No

Replace all spark plugs on all cylinders.  [Ref. to IGNITION\(H4DO\)>Spark Plug.](#)

45. CHECK DATA MONITOR.


Using the Subaru Select Monitor, record the value of [Engine Speed] during cranking.

Note:


For detailed operation procedures, refer to the "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Does the recorded value of [Engine Speed] contain data of 0 rpm?

Yes

It is possible that temporary fault occurs in the crankshaft position sensor circuit. Check the crankshaft position sensor circuit.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT.](#)

No

 [Go to 46.](#)

46. CHECK IGNITION COIL POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ignition coil.
3. Turn the ignition switch to ON.
4. Measure the voltage between ignition coil connector and engine ground.

Connector & terminal

(E31) No. 1 (+) — Engine ground (-):


(E32) No. 1 (+) — Engine ground (-):

(E33) No. 1 (+) — Engine ground (-):

(E34) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 47.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- Open or short to ground in power supply circuit

- **Poor contact of coupling connector**
- **Blown out of fuse**

47. CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and ignition coil connector.

Connector & terminal

(B135) No. 37 — (E31) No. 2:


(B135) No. 35 — (E32) No. 2:

(B135) No. 38 — (E33) No. 2:

(B135) No. 36 — (E34) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 48.](#)

No

Repair the open circuit in harness between ECM connector and ignition coil connector.

48. CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR.

Measure the resistance of harness between ECM connector and engine ground.

Connector & terminal

(B135) No. 37 — Engine ground:


(B135) No. 35 — Engine ground:

(B135) No. 38 — Engine ground:

(B135) No. 36 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 49.](#)

No

Repair the ground short circuit of harness between ECM connector and ignition coil connector.

49. CHECK HARNESS OF IGNITION COIL GROUND CIRCUIT.

1. Turn the ignition switch to OFF.



2. Measure the resistance of harness between ignition coil connector and engine ground.

Connector & terminal

- (E31) No. 3 — Engine ground:
- (E32) No. 3 — Engine ground:
- (E33) No. 3 — Engine ground:
- (E34) No. 3 — Engine ground:

Is the resistance less than 5 Ω?

Yes

Replace the ignition coil.  [Ref. to IGNITION\(H4DO\)>Ignition Coil.](#) If the fault occurs after servicing, continue the diagnosis.  [Go to 89.](#)


No

Repair the open circuit in harness between ignition coil connector and engine grounding terminal.

50. CHECK OF FUEL PUMP.

1. On the item [Active Test], select [Fuel Pump Control (ON/OFF Dr.)] and perform ON/OFF drive.



Note:

For detailed operation procedures, refer to the "Active Test".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Active Test.](#)


2. Check if operating sound occurs in the fuel pump according to ON/OFF switching operation.

Does the fuel pump emit operating sound?


Yes

Check the fuel pump and fuel delivery line.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Pump>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Delivery and Evaporation Lines>INSPECTION.](#)

No



 [Go to 51.](#)

51. CHECK OF FUEL PUMP.


Check fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Pump>INSPECTION.](#)

Is the fuel pump normal?

Yes

Check fuel pump system.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Pump>INSPECTION.](#) If the fault occurs after servicing, continue the diagnosis.  [Go to 83.](#)


No

Replace the fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Pump.](#)

52. CHECK DATA MONITOR.


Using the Subaru Select Monitor, record the value of [Engine Speed] during cranking.

Note:


For detailed operation procedures, refer to the "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Does the recorded value of [Engine Speed] contain data of 0 rpm?

Yes

It is possible that temporary fault occurs in the crankshaft position sensor circuit. Check the crankshaft position sensor circuit.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT.](#)

No

 [Go to 53.](#)

53. CHECK POWER SUPPLY CIRCUIT OF FUEL INJECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector.
3. Turn the ignition switch to ON.
4. Measure the voltage between fuel injector connector and the engine ground.

Connector & terminal

- (E5) No. 2 (+) — Engine ground (-):
- (E16) No. 2 (+) — Engine ground (-):
- (E6) No. 2 (+) — Engine ground (-):
- (E17) No. 2 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 54.](#)

No

Repair the power supply circuit.

54. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and fuel injector connector.

Connector & terminal

- #1 (B135) No. 23 — (E5) No. 1:
- #2 (B135) No. 8 — (E16) No. 1:
- #3 (B135) No. 9 — (E6) No. 1:
- #4 (B135) No. 22 — (E17) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 55.](#)

No

Repair the open circuit of the harness between the ECM connector and fuel injector connector.

55. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.




Measure the resistance between the ECM connector and engine ground.

Connector & terminal

- #1 (B135) No. 23 — Engine ground:
- #2 (B135) No. 8 — Engine ground:
- #3 (B135) No. 9 — Engine ground:
- #4 (B135) No. 22 — Engine ground:

Is the resistance 1 M Ω or more?

Yes


Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Engine Control Module \(ECM\).](#)

No

Repair the short circuit to ground in harness between ECM connector and fuel injector connector.


56. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.




Check the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor>INSPECTION.](#)

Is the mass air flow and intake air temperature sensor normal?

Yes

 [Go to 57.](#)

No


 [Go to 68.](#)

57. CHECK AIR INTAKE SYSTEM.


Check the installing condition of the air intake system.

Are there holes, loose bolts or disconnection of hose on air intake system?


Yes

Repair the air intake system.  [Ref. to INTAKE \(INDUCTION\) \(H4DO\)>General Description.](#)

No


 [Go to 58.](#)

58. CHECK THROTTLE BODY.


Check throttle body.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Throttle Body>INSPECTION.](#)

Is there any deposit in the throttle body?

Yes

Replace the throttle body.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Throttle Body.](#)


No

 [Go to 59.](#)

59. CHECK FREEZE FRAME DATA.

1. Using the Subaru Select Monitor, read the values in [VVT Adv. Ang. Amount R], [VVT Advance Target Angle Amount R], [VVT Adv. Ang. Amount L] and [VVT Advance Target Angle Amount L].


Note:

For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

2. Using the Subaru Select Monitor, compare the values between [VVT Adv. Ang. Amount R] and [VVT Advance Target Angle Amount R], and between [VVT Adv. Ang. Amount L] and [VVT Advance Target Angle Amount L].



Does all of the advance angle amount and retard angle amount synchronize with their target values?

Yes

 [Go to 98.](#)

No

Diagnose the part where there is difference of 10 deg or more.

- Intake RH:  [Go to 60.](#)
- Intake LH:  [Go to 64.](#)

60. CHECK POWER SUPPLY TO THE INTAKE OIL CONTROL SOLENOID RH.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake oil control solenoid RH.
3. Turn the ignition switch to ON.
4. Measure the voltage between intake oil control solenoid RH connector and engine ground.

Connector & terminal

(E38) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 61.](#)

No

Repair the power supply circuit.

61. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and intake oil control solenoid RH.

Connector & terminal

(B135) No. 20 — (E38) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 62.](#)

No

Repair the open circuit in harness between ECM connector and intake oil control solenoid RH connector.

62. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH CONNECTOR.


Measure the resistance between intake oil control solenoid RH connector and engine ground.

Connector & terminal

(E38) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 63.](#)

No


Repair the short circuit to ground in harness between ECM connector and intake oil control solenoid RH connector.

63. CHECK INTAKE OIL CONTROL SOLENOID RH.


Check the intake oil control solenoid RH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Oil Control Solenoid>INSPECTION.](#)

Is the intake oil control solenoid RH normal?

Yes

Replace the intake cam sprocket RH.  [Ref. to MECHANICAL\(H4DO\)>Cam Sprocket.](#)

No

Replace the intake oil control solenoid RH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Oil Control Solenoid.](#)

64. CHECK POWER SUPPLY TO THE INTAKE OIL CONTROL SOLENOID LH.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake oil control solenoid LH.
3. Turn the ignition switch to ON.
4. Measure the voltage between intake oil control solenoid LH connector and engine ground.

Connector & terminal

(E37) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?



 [Go to 65.](#)

Yes

No

Repair the power supply circuit.

65. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and intake oil control solenoid LH.

Connector & terminal

(B135) No. 6 — (E37) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 66.](#)

No

Repair the open circuit in harness between ECM connector and intake oil control solenoid LH connector.

66. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH CONNECTOR.


Measure the resistance between intake oil control solenoid LH connector and engine ground.

Connector & terminal

(E37) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?


Yes

 [Go to 67.](#)

No


Repair the short circuit to ground in harness between ECM connector and intake oil control solenoid LH connector.

67. CHECK INTAKE OIL CONTROL SOLENOID LH.


Check the intake oil control solenoid LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Oil Control Solenoid>INSPECTION.](#)

Is the intake oil control solenoid LH normal?

Yes

Replace the intake cam sprocket LH.  [Ref. to MECHANICAL\(H4DO\)>Cam Sprocket.](#)

No

Replace the intake oil control solenoid LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Oil Control Solenoid.](#)

68. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the mass air flow and intake air temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and the mass air flow and intake air temperature sensor connector.


Connector & terminal

(B134) No. 16 — (B3) No. 5:

(B134) No. 17 — (B3) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 69.](#)

No

Repair the open circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

69. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.

Measure the resistance between the ECM connector and engine ground.



Connector & terminal

(B134) No. 16 — Engine ground:

(B134) No. 17 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#) If the fault occurs after servicing, continue the diagnosis.  [Go to 98.](#)

No

Repair the ground short circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

70. CHECK ENGINE COOLANT TEMPERATURE SENSOR.






Check the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Engine Coolant Temperature Sensor>INSPECTION.](#)

Is the engine coolant temperature sensor normal?

Yes

 [Go to 71.](#)

No

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Coolant Temperature Sensor.](#) If the fault occurs after servicing, replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#) If the fault still occurs after replacing the ECM, continue the diagnosis.  [Go to 109.](#)

71. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the engine coolant temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and engine coolant temperature sensor connector.


Connector & terminal

(B135) No. 34 — (E8) No. 1:



(B135) No. 43 — (E8) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 72.](#)

No

Repair the open circuit of the harness between the ECM connector and engine coolant temperature sensor connector. If the fault occurs after servicing, replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Engine Control Module \(ECM\).](#) If the fault still occurs after replacing the ECM, continue the diagnosis.  [Go to 109.](#)

72. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.



Measure the resistance between the ECM connector and engine ground.


Connector & terminal

(B135) No. 43 — Engine ground:



(B135) No. 34 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 73.](#)


No

Repair the short circuit to ground in harness between ECM connector and engine coolant temperature sensor connector. If the fault occurs after servicing, replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Engine Control Module \(ECM\).](#) If the fault still occurs after replacing the ECM, continue the diagnosis.  [Go to 109.](#)

73. CHECK DATA MONITOR.


1. Turn the ignition switch to ON. (Engine OFF)
2. Using the Subaru Select Monitor, read the values in [Long Term Fuel Trim (B1)] and [Barometric Pressure].

Note:


For detailed operation procedures, refer to the "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Is the value of [Long Term Fuel Trim (B1)] -25 — 25%? And is the value of [Barometric Pressure] 80 kPa (600 mmHg, 23.6 inHg) or more?


Yes

 [Go to 76.](#)

No


 [Go to 74.](#)

74. CHECK FOR MALFUNCTION OCCURRENCE.


1. Clear the memory.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)
2. Start the engine.

Does the engine start?

Yes

 [Go to 75.](#)

No

 [Go to 76.](#)

75. CHECK IDLE SPEED.



Check the idle speed.

Is the idle speed stable?

Yes

Replace the mass air flow and intake air temperature sensor. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor](#). If the fault occurs after servicing, replace the ECM. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\)](#). If the fault still occurs after replacing the ECM, continue the diagnosis. [Go to 109](#).

No

Replace the fuel injector. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Injector](#). If the fault occurs after servicing, replace the ECM. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\)](#). If the fault still occurs after replacing the ECM, continue the diagnosis. [Go to 109](#).

76. CHECK FUEL PRESSURE.



Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.

Measure the fuel pressure. [Ref. to MECHANICAL\(H4DO\)>Fuel Pressure>INSPECTION](#).

Caution:

Before attaching/detaching a fuel pressure gauge, release the fuel pressure.

Is the measured value 334 — 400 kPa (3.4 — 4.1 kgf/cm², 48 — 58 psi)?

Yes

[Go to 77](#).

No

[Go to 82](#).

77. CHECK SPARK PLUG.



Check the spark plug. [Ref. to IGNITION\(H4DO\)>Spark Plug>INSPECTION](#).

Are all spark plug in all cylinders normal?



Yes

[Go to 78.](#)

No

- When spark plugs in some cylinders are faulty: Replace the faulty spark plugs of the cylinders, then check the ignition system and fuel system in the faulty cylinders. [Ref. to IGNITION\(H4DO\)>Spark Plug.](#) If the fault occurs after servicing, continue the diagnosis. [Go to 109.](#)
- When all spark plugs in all cylinders are faulty: Replace faulty spark plugs in all cylinders. [Ref. to IGNITION\(H4DO\)>Spark Plug.](#) If the fault occurs after servicing, continue the diagnosis. [Go to 109.](#)

78. CHECK FOR MALFUNCTION OCCURRENCE.

Check for the condition of fault occurrence.

Does the fault occur only within approx. 15 to 120 minutes after the engine is stopped?

Yes

[Go to 80.](#)

No

- When the fault occurs in two or three minutes or a long time after the engine is stopped: [Go to 79.](#)
- When the fault occurrence pattern is inconsistent: [Go to 109.](#)

79. CHECK FUEL PRESSURE.

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.

Measure the fuel pressure five minutes after the engine is stopped. [Ref. to MECHANICAL\(H4DO\)>Fuel Pressure>INSPECTION.](#)

Caution:

Before attaching/detaching a fuel pressure gauge, release the fuel pressure.

Note:

If the engine does not start, measure the fuel pressure five minutes after cranking is completed.

Is the measured value 147 kPa (1.5 kgf/cm², 21 psi) or more?

Yes

[Go to 108.](#)

No

Replace the pressure regulator. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Filter.](#)

80. CHECK PURGE CONTROL SOLENOID VALVE.



Check the purge control solenoid valve. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Purge Control Solenoid Valve>INSPECTION.](#)

Is the purge control solenoid valve OK?

Yes

[Go to 81.](#)

No

Replace the faulty purge control solenoid valve. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Purge Control Solenoid Valve.](#)

81. CHECK FUEL INJECTOR.



1. After the engine is stopped, scavenge inside of the intake manifold by applying compressed air.
2. Measure the HC concentration inside the intake manifold 15 minutes after scavenging is completed.

Note:

- **If HC concentration gauge is not available, go to the next step.**
- **For measuring HC concentration, remove the vacuum hose between intake manifold assembly and purge control solenoid valve to measure the HC concentration in the intake manifold assembly.**

Is the HC concentration less than 4,000 ppm?

Yes

[Go to 109.](#)

No

Replace the fuel injector. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Injector.](#)

82. CHECK OF FUEL PUMP.




Check fuel pump. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Pump>INSPECTION.](#)


Is the fuel pump normal?

Yes


Check fuel pump system. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Pump>INSPECTION.](#) If the fault occurs after servicing, continue

the diagnosis.  [Go to 109.](#)

No


Replace the fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Pump.](#)

83. CHECK FUEL INJECTOR.


Check fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Injector>INSPECTION.](#)

Are fuel injectors OK?

Yes

 [Go to 84.](#)

No

Replace the fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Injector.](#)

84. CHECK POWER SUPPLY CIRCUIT OF FUEL INJECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector.
3. Turn the ignition switch to ON.
4. Measure the voltage between fuel injector connector and the engine ground.

Connector & terminal

- (E5) No. 2 (+) — Engine ground (–):
- (E16) No. 2 (+) — Engine ground (–):
- (E6) No. 2 (+) — Engine ground (–):
- (E17) No. 2 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 85.](#)

No

Repair the power supply circuit.

85. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector.
3. Disconnect the connector from ECM.


4. Measure the resistance of harness between ECM connector and fuel injector connector.

Connector & terminal

- #1 (B135) No. 23 — (E5) No. 1:
- #2 (B135) No. 8 — (E16) No. 1:
- #3 (B135) No. 9 — (E6) No. 1:
- #4 (B135) No. 22 — (E17) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 86.](#)

No

Repair the open circuit of the harness between the ECM connector and fuel injector connector.

86. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.




Measure the resistance between the ECM connector and engine ground.

Connector & terminal

- #1 (B135) No. 23 — Engine ground:
- #2 (B135) No. 8 — Engine ground:
- #3 (B135) No. 9 — Engine ground:
- #4 (B135) No. 22 — Engine ground:

Is the resistance 1 M Ω or more?

Yes


 [Go to 87.](#)

No

Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

87. CHECK FOR MALFUNCTION OCCURRENCE.




- 1.** Replace the crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Crankshaft Position Sensor.](#)
- 2.** Check that the fault is removed.

Is the fault removed?


Yes

Clear the memory to complete.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Clear Memory Mode.](#)

No


 [Go to 88.](#)

88. CHECK FOR MALFUNCTION OCCURRENCE.


1. Replace the camshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Camshaft Position Sensor.](#)
2. Check that the fault is removed.

Is the fault removed?

Yes

Clear the memory to complete.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Clear Memory Mode.](#)


No

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Engine Control Module \(ECM\).](#)


89. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.

Is the crankshaft position sensor installed correctly?

Yes

 [Go to 90.](#)


No

Install the crankshaft position sensor correctly.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Crankshaft Position Sensor>INSTALLATION.](#)


90. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR.

Is the camshaft position sensor installed correctly?

Yes

 [Go to 91.](#)

No

Install the camshaft position sensor correctly.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Camshaft Position Sensor>INSTALLATION.](#)

91. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and crankshaft position sensor connector.


Connector & terminal

(B135) No. 40 — (E10) No. 1:

(B135) No. 27 — (E10) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 92.](#)

No

Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.

92. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.



Measure the resistance between crankshaft position sensor connector and engine ground.


Connector & terminal

(E10) No. 1 — Engine ground:

(E10) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 93.](#)

No

Repair short circuit to ground in harness between ECM connector and crankshaft position sensor connector.

93. CHECK POWER SUPPLY OF INTAKE CAMSHAFT POSITION SENSOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake camshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between intake camshaft position sensor connector and engine ground.


Connector & terminal

(E35) No. 1 (+) — Engine ground (-):

(E36) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 94.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit or short circuit to ground in harness between main relay connector and intake camshaft position sensor connector**
- **Poor contact of coupling connector**

94. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and intake camshaft position sensor connector.

Connector & terminal

(B135) No. 41 — (E35) No. 2:
(B135) No. 42 — (E35) No. 3:
(B135) No. 54 — (E36) No. 2:
(B135) No. 42 — (E36) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 95.](#)

No

Repair the open circuit in the harness between ECM connector and intake camshaft position sensor connector.

95. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR CONNECTOR.


Measure the resistance between intake camshaft position sensor connector and engine ground.

Connector & terminal

(E35) No. 2 — Engine ground:
(E36) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?


Yes

 [Go to 96.](#)

No


Repair short circuit to ground in the harness between ECM connector and intake camshaft position sensor connector.

96. CHECK FOR MALFUNCTION OCCURRENCE.


1. Replace the crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Crankshaft Position Sensor.](#)
2. Check that the fault is removed.

Is the fault removed?


Yes

Clear the memory to complete.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Clear Memory Mode.](#)

No


 [Go to 97.](#)

97. CHECK FOR MALFUNCTION OCCURRENCE.


1. Replace the camshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Camshaft Position Sensor.](#)
2. Check that the fault is removed.

Is the fault removed?


Yes

Clear the memory to complete.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Clear Memory Mode.](#)

No


Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Engine Control Module \(ECM\).](#)

98. CHECK ENGINE COOLANT TEMPERATURE SENSOR.


Check the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Engine Coolant Temperature Sensor>INSPECTION.](#)

Is the engine coolant temperature sensor normal?

Yes

 [Go to 99.](#)

No

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Coolant Temperature Sensor.](#)

99. CHECK FUEL PRESSURE.

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.


Measure the fuel pressure.  [Ref. to MECHANICAL\(H4DO\)>Fuel Pressure>INSPECTION.](#)

Caution:


Before attaching/detaching a fuel pressure gauge, release the fuel pressure.

Is the measured value 334 — 400 kPa (3.4 — 4.1 kgf/cm², 48 — 58 psi)?

Yes

 [Go to 100.](#)

No

 [Go to 117.](#)


100. CHECK FUEL PRESSURE.

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.

Measure the fuel pressure five minutes after the engine is stopped.  [Ref. to MECHANICAL\(H4DO\)>Fuel Pressure>INSPECTION.](#)

Caution:


Before attaching/detaching a fuel pressure gauge, release the fuel pressure.

Note:


If the engine does not start, measure the fuel pressure five minutes after cranking is completed.

Is the measured value 147 kPa (1.5 kgf/cm², 21 psi) or more?

Yes

 [Go to 101.](#)


No

 [Go to 117.](#)

101. CHECK DATA MONITOR.


1. Turn the ignition switch to ON. (Engine OFF)
2. Using the Subaru Select Monitor, read the value in [Long Term Fuel Trim (B1)].

Note:


For detailed operation procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Does the value of [Long Term Fuel Trim (B1)] fall within a range of -15 — 15%?

Yes

 [Go to 102.](#)

No

Replace the fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Injector.](#)

102. CHECK FOR MALFUNCTION OCCURRENCE.


Start the engine and check the idling speed.

Is the idling speed stable all time?

Yes

It is possible that the fault comes from fuel. Replace fuel.

No

 [Go to 103.](#)


103. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.

Is the crankshaft position sensor installed correctly?

Yes

 [Go to 104.](#)

No

Install the crankshaft position sensor correctly.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Crankshaft Position Sensor>INSTALLATION.](#)

104. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and crankshaft position

sensor connector.


Connector & terminal

(B135) No. 40 — (E10) No. 1:

(B135) No. 27 — (E10) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 105.](#)

No

Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.

105. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.



Measure the resistance between crankshaft position sensor connector and engine ground.


Connector & terminal

(E10) No. 1 — Engine ground:

(E10) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes


 [Go to 106.](#)

No

Repair short circuit to ground in harness between ECM connector and crankshaft position sensor connector.


106. CHECK COMPRESSION PRESSURE.




Check the compression pressure.  [Ref. to MECHANICAL\(H4DO\)>Compression>INSPECTION.](#)

Is the compression pressure normal?

Yes


 [Go to 107.](#)

No

Check the engine.  [Ref. to MECHANICAL\(H4DO\)>Symptoms and causes>INSPECTION.](#)


107. CHECK FOR MALFUNCTION OCCURRENCE.





1. Replace the crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Crankshaft Position Sensor.](#)
2. Check that the fault is removed.

Is the fault removed?


Yes

Clear the memory to complete.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Clear Memory Mode.](#)

No


Check the valve timing.  [Ref. to MECHANICAL\(H4DO\)>Timing Chain Assembly.](#) When the valve timing is normal, replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)

108. CHECK OF FUEL PUMP.


Check fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Pump>INSPECTION.](#)

Is the fuel pump normal?

Yes

Check fuel pump circuit.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostics for Engine Starting Failure>FUEL PUMP CIRCUIT.](#)

No

Replace the fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Pump.](#)

109. CHECK FUEL PRESSURE.

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.


Measure the fuel pressure.  [Ref. to MECHANICAL\(H4DO\)>Fuel Pressure>INSPECTION.](#)

Caution:

Before attaching/detaching a fuel pressure gauge, release the fuel pressure.

Is the measured value 334 — 400 kPa (3.4 — 4.1 kgf/cm², 48 — 58 psi)?

Yes

 [Go to 110.](#)

No

 [Go to 117.](#)


110. CHECK FUEL PRESSURE.

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.

Measure the fuel pressure five minutes after the engine is stopped.  [Ref. to MECHANICAL\(H4DO\)>Fuel Pressure>INSPECTION.](#)

Caution:


Before attaching/detaching a fuel pressure gauge, release the fuel pressure.

Note:


If the engine does not start, measure the fuel pressure five minutes after cranking is completed.

Is the measured value 147 kPa (1.5 kgf/cm², 21 psi) or more?

Yes

 [Go to 111.](#)


No

 [Go to 117.](#)

111. CHECK DATA MONITOR.


1. Turn the ignition switch to ON. (Engine OFF)
2. Using the Subaru Select Monitor, read the value in [Long Term Fuel Trim-Bank1].

Note:


For detailed operation procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Does the value of [Long Term Fuel Trim-Bank1] fall within a range of -15 — 15%?

Yes

 [Go to 112.](#)

No

Replace the fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Injector.](#)

112. CHECK FOR MALFUNCTION OCCURRENCE.


Start the engine and check the idling speed.

Is the idling speed stable all time?

Yes

It is possible that the fault comes from fuel. Replace fuel.

No

 [Go to 113.](#)


113. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.

Is the crankshaft position sensor installed correctly?

Yes

 [Go to 114.](#)

No

Install the crankshaft position sensor correctly.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Crankshaft Position Sensor>INSTALLATION.](#)

114. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and crankshaft position sensor connector.


Connector & terminal

(B135) No. 40 — (E10) No. 1:

(B135) No. 27 — (E10) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 115.](#)

No

Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.

115. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.

Measure the resistance between crankshaft position sensor connector and engine ground.


Connector & terminal

(E10) No. 1 — Engine ground:

(E10) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?


Yes

 [Go to 116.](#)

No

Repair short circuit to ground in harness between ECM connector and crankshaft position sensor connector.

116. CHECK FOR MALFUNCTION OCCURRENCE.


1. Replace the crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Crankshaft Position Sensor.](#)
2. Check that the fault is removed.

Is the fault removed?


Yes

Clear the memory to complete.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Clear Memory Mode.](#)

No


Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Engine Control Module \(ECM\).](#)

117. CHECK OF FUEL PUMP.


Check fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Pump>INSPECTION.](#)

Is the fuel pump normal?


Yes

 [Go to 118.](#)

No


Replace the fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Pump.](#)

118. CHECK FUEL PUMP SYSTEM.


Check fuel pump circuit.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostics for Engine Starting Failure>FUEL PUMP CIRCUIT.](#)

Is the fuel pump system normal?


Yes

 [Go to 119.](#)

No


Repair the fuel pump circuit.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostics for Engine Starting Failure>FUEL PUMP CIRCUIT.](#)

119. CHECK PURGE CONTROL SOLENOID VALVE.


Check the purge control solenoid valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Purge Control Solenoid Valve>INSPECTION.](#)

Is the purge control solenoid valve OK?

Yes

 [Go to 120.](#)

No

Replace the faulty purge control solenoid valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Purge Control Solenoid Valve.](#)

120. CHECK FUEL INJECTOR.


1. After the engine is stopped, scavenge inside of the intake manifold by applying compressed air.
2. Measure the HC concentration inside the intake manifold 15 minutes after scavenging is completed.

Note:


- **If HC concentration gauge is not available, go to the next step.**
- **For measuring HC concentration, remove the vacuum hose between intake manifold assembly and purge control solenoid valve to measure the HC concentration in the intake manifold assembly.**

Is the HC concentration less than 4,000 ppm?

Yes

 [Go to 121.](#)

No


Replace the fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Injector.](#)

121. CHECK INTAKE VALVE.


Check the intake valve.  [Ref. to MECHANICAL\(H4DO\)>Cylinder Head>INSPECTION.](#)

Is there any deposit in the intake valve?


Yes

Clean the intake valve.  [Ref. to MECHANICAL\(H4DO\)>Cylinder Head.](#)

No


 [Go to 122.](#)

122. CHECK ENGINE COOLANT TEMPERATURE SENSOR.


Check the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Coolant Temperature Sensor>INSPECTION.](#)

Is the engine coolant temperature sensor normal?

Yes

 [Go to 123.](#)

No

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Coolant Temperature Sensor.](#)


123. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.

Is the crankshaft position sensor installed correctly?

Yes

 [Go to 124.](#)


No

Install the crankshaft position sensor correctly.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Crankshaft Position Sensor>INSTALLATION.](#)


124. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR.

Is the camshaft position sensor installed correctly?

Yes

 [Go to 125.](#)

No

Install the camshaft position sensor correctly.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Camshaft Position Sensor>INSTALLATION.](#)

125. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and crankshaft position sensor connector.


Connector & terminal

(B135) No. 40 — (E10) No. 1:

(B135) No. 27 — (E10) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 126.](#)

No

Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.

126. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.



Measure the resistance between crankshaft position sensor connector and engine ground.


Connector & terminal

(E10) No. 1 — Engine ground:

(E10) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 127.](#)

No

Repair short circuit to ground in harness between ECM connector and crankshaft position sensor connector.

127. CHECK POWER SUPPLY OF INTAKE CAMSHAFT POSITION SENSOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake camshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between intake camshaft position sensor connector and engine ground.


Connector & terminal

(E35) No. 1 (+) — Engine ground (-):

(E36) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 128.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit or short circuit to ground in harness between main relay connector and intake camshaft position sensor connector**
- **Poor contact of coupling connector**

128. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and intake camshaft position sensor connector.

Connector & terminal

(B135) No. 41 — (E35) No. 2:


(B135) No. 42 — (E35) No. 3:

(B135) No. 54 — (E36) No. 2:

(B135) No. 42 — (E36) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 129.](#)

No

Repair the open circuit in the harness between ECM connector and intake camshaft position sensor connector.

129. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR CONNECTOR.

Measure the resistance between intake camshaft position sensor connector and engine ground.


Connector & terminal

(E35) No. 2 — Engine ground:

(E36) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?


Yes

 [Go to 130.](#)

No


Repair short circuit to ground in the harness between ECM connector and intake camshaft position sensor connector.

130. CHECK COMPRESSION PRESSURE.


Check the compression pressure.  [Ref. to MECHANICAL\(H4DO\)>Compression>INSPECTION.](#)

Is the compression pressure normal?


Yes

 [Go to 131.](#)

No


Check the engine.  [Ref. to MECHANICAL\(H4DO\)>Symptoms and causes>INSPECTION.](#)

131. CHECK FOR MALFUNCTION OCCURRENCE.


1. Replace the crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Crankshaft Position Sensor.](#)
2. Check that the fault is removed.

Is the fault removed?


Yes

Clear the memory to complete.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Clear Memory Mode.](#)

No

 [Go to 132.](#)

132. CHECK FOR MALFUNCTION OCCURRENCE.

1. Replace the camshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Camshaft Position Sensor.](#)
2. Check that the fault is removed.

Is the fault removed?

Yes

Clear the memory to complete.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Clear Memory Mode.](#)

No

Check the valve timing. [Ref. to MECHANICAL\(H4DO\)>Timing Chain Assembly.](#) When the valve timing is normal, replace the ECM. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)

1. OUTLINE OF DIAGNOSIS

Judge as NG when the status enters into any one of the followings.

- Although starter signal input is present in ECM, the engine does not start (diagnosis 1)
- Although starter signal input is present in ECM, starting takes more time than it should (diagnosis 1)
- The engine stops immediately after starting except by operating the ignition switch (diagnosis 2)

2. EXECUTION CONDITION

Diagnosis 1

Secondary Parameters	Execution condition
Starter signal	ON

Diagnosis 2

Secondary Parameters	Execution condition
Elapsed time after starting the engine	≤ 2 s

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

4. DIAGNOSTIC METHOD

Diagnosis 1

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Engine speed	< 500 rpm

Time needed for diagnosis: 2 – 26 seconds

Diagnosis 2

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Engine speed	< 300 rpm

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Does not illuminate.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1C00 BATTERY MONITOR MODULE "A" PERFORMANCE


DTC detecting condition:

Immediately at fault recognition

Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode, and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.

1. CHECK DTC.

Check for DTC.  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Read Diagnostic Trouble Code (DTC).

Is P1C00 displayed in [DTC]?

Yes

Replace the battery sensor.  Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery Sensor.

No

Even if DTC is detected, it has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

1. COMPONENT DESCRIPTION

The battery sensor monitors the data of battery voltage, current, temperature, etc. ECM receives these data via LIN communication with the battery sensor.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Ignition switch	ON

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

4. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Receives internal abnormality or	ON

Receives temperature sensor error or Receives voltage sensor error or Receives current sensor error	ON ON ON
---	------------------------

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Does not illuminate.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2004 TGV CONTROL STUCK OPEN BANK 1

DTC detecting condition:

Immediately at fault recognition


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE..

1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>List of Diagnostic Trouble Code (DTC)..

No

 Go to 2..

2. CHECK TUMBLE GENERATOR VALVE RH.


1. Remove the tumble generator valve assembly RH.
2. Check the tumble generator valve.

Is there any dirt or clogging with foreign objects in the tumble generator valve?

Yes

Clean the tumble generator valve.

No

Replace the tumble generator valve RH.  Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Tumble Generator Valve.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of tumble generator valve motor function.

Judge open fixing malfunction when the opening degree is large even after finishing the tumble generator valve closing driving.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
----------------------	---------------------

Battery voltage	$\geq 10.9 \text{ V}$ (CVT model) $\geq 10.9 \text{ V}$ (MT model)
Tumble generator valve "close" signal output time	$\geq 1600\text{ms}$ (CVT model) $\geq 1600\text{ms}$ (MT model)

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Tumble generator valve opening angle	$\geq 71.4^\circ$

Time needed for diagnosis: 3000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2005 TGV CONTROL STUCK OPEN BANK 2

DTC detecting condition:

Immediately at fault recognition


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE..

1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>List of Diagnostic Trouble Code (DTC)..

No

 Go to 2..

2. CHECK TUMBLE GENERATOR VALVE LH.


1. Remove the tumble generator valve assembly LH.
2. Check the tumble generator valve.

Is there any dirt or clogging with foreign objects in the tumble generator valve?

Yes

Clean the tumble generator valve.

No

Replace the tumble generator valve LH.  Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Tumble Generator Valve.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of tumble generator valve motor function.

Judge open fixing malfunction when the opening degree is large even after finishing the tumble generator valve closing driving.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
----------------------	---------------------

Battery voltage	$\geq 10.9 \text{ V}$ (CVT model) $\geq 10.9 \text{ V}$ (MT model)
Tumble generator valve "close" signal output time	$\geq 1600\text{ms}$ (CVT model) $\geq 1600\text{ms}$ (MT model)

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Tumble generator valve opening angle	$\geq 71.4^\circ$

Time needed for diagnosis: 3000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2006 TGV CONTROL STUCK CLOSED BANK 1

DTC detecting condition:

Immediately at fault recognition


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE..

1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>List of Diagnostic Trouble Code (DTC)..

No

 Go to 2.

2. CHECK TUMBLE GENERATOR VALVE RH.


1. Remove the tumble generator valve assembly RH.
2. Check the tumble generator valve.

Is there any dirt or clogging with foreign objects in the tumble generator valve?

Yes

Clean the tumble generator valve.

No

Replace the tumble generator valve RH.  Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Tumble Generator Valve.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of tumble generator valve motor function.

Judge close fixing malfunction when the opening degree is small even after finishing the tumble generator valve open driving.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
----------------------	---------------------

Battery voltage	$\geq 10.9 \text{ V}$ (CVT model) $\geq 10.9 \text{ V}$ (MT model)
Tumble generator valve "close" signal output time	$\geq 1600\text{ms}$ (CVT model) $\geq 1600\text{ms}$ (MT model)

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Tumble generator valve opening angle	$\geq 71.4^\circ$

Time needed for diagnosis: 3000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2007 TGV CONTROL STUCK CLOSED BANK 2

DTC detecting condition:

Immediately at fault recognition


Caution:

After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode>OPERATION.](#) and Inspection Mode  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode>PROCEDURE.](#)

1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 2.](#)

2. CHECK TUMBLE GENERATOR VALVE LH.


1. Remove the tumble generator valve assembly LH.
2. Check the tumble generator valve.

Is there any dirt or clogging with foreign objects in the tumble generator valve?

Yes

Clean the tumble generator valve.

No

Replace the tumble generator valve LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Tumble Generator Valve.](#)

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of tumble generator valve motor function.

Judge close fixing malfunction when the opening degree is small even after finishing the tumble generator valve open driving.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
----------------------	---------------------

Battery voltage	$\geq 10.9 \text{ V}$
Tumble generator valve "open" signal output time	$\geq 1600 \text{ ms}$

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Tumble generator valve opening angle switch	= Low

Time needed for diagnosis: 4600 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2008 TGV CONTROL CIRCUIT/OPEN BANK 1

DTC detecting condition:

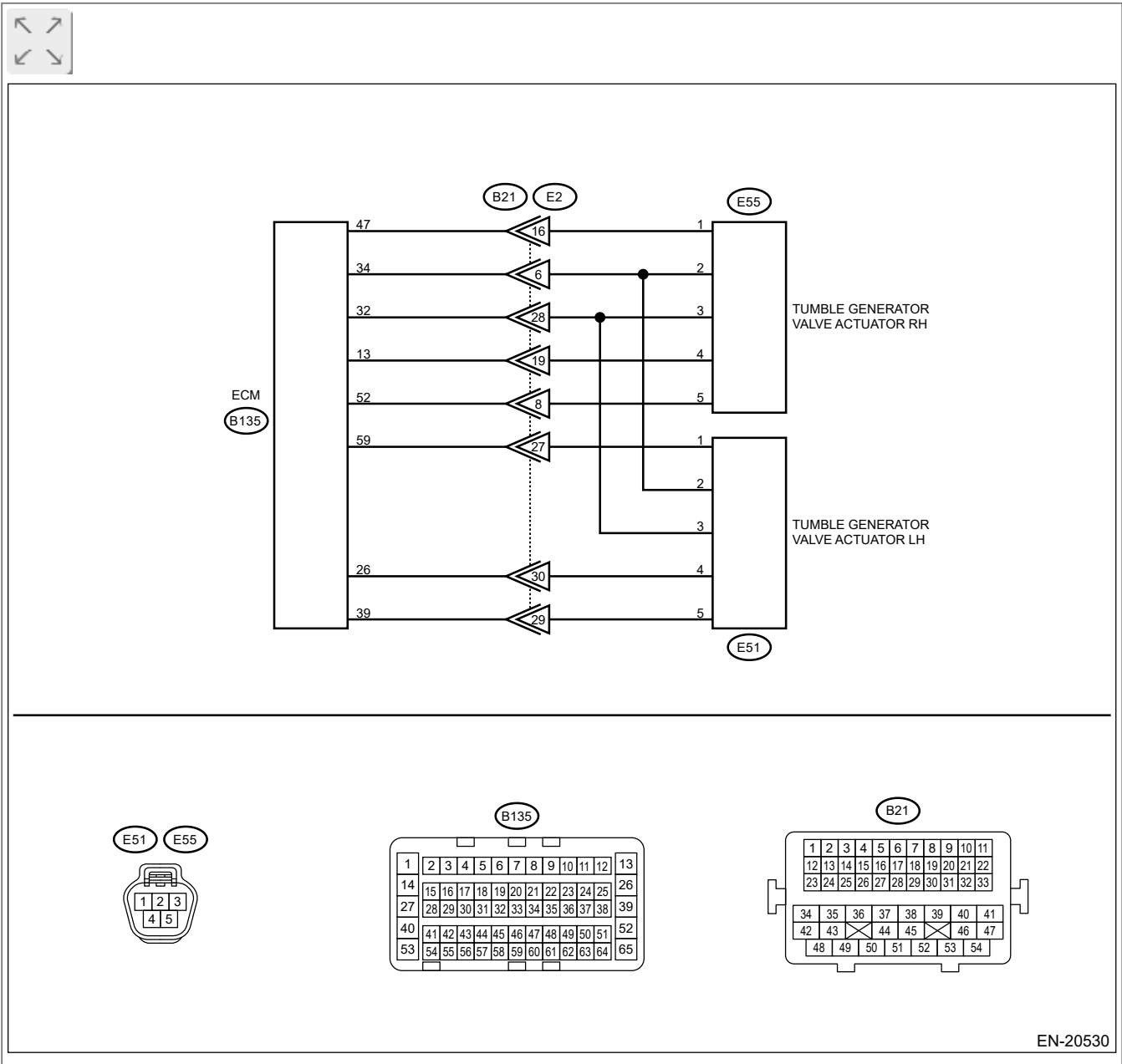
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ASSEMBLY RH CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from tumble generator valve assembly RH.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and tumble generator valve assembly RH connector.

Connector & terminal

(B135) No. 52 — (E55) No. 5:

(B135) No. 13 — (E55) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 2.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- Open circuit in harness between ECM connector and tumble generator valve assembly RH connector
- Poor contact of coupling connector

2. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ASSEMBLY RH CONNECTOR.



Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B135) No. 52 — Chassis ground:

(B135) No. 13 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 3.](#)

No

Repair the short circuit to ground in harness between ECM connector and tumble generator valve assembly RH connector.

3. CHECK FOR POOR CONTACT.



Check for poor contact of tumble generator valve assembly RH connector.

Is there poor contact of the tumble generator valve assembly RH connector?

Yes

Repair the poor contact of tumble generator valve assembly RH connector.

No

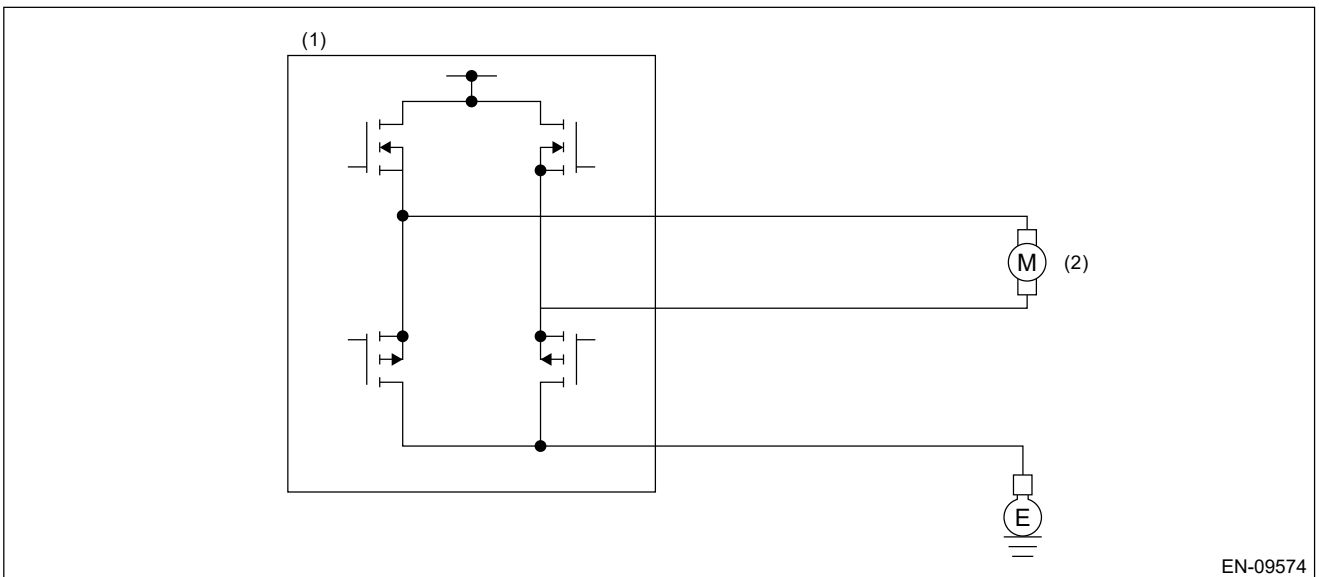
Replace the tumble generator valve assembly RH. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Tumble Generator Valve.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open circuit of tumble generator valve motor.

Judge as NG when the output voltage remains high when the tumble generator valve motor is not energized.

2. COMPONENT DESCRIPTION



(1) Engine control module (ECM) (2) Tumble generator valve

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Tumble generator valve drive duty	$\leq 79.17\%$

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
----------------------	-----------------

Output voltage	> Battery voltage × 0.55
----------------	-----------------------------

Time needed for diagnosis: 1920 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2009 TGV CONTROL CIRCUIT LOW BANK 1

DTC detecting condition:

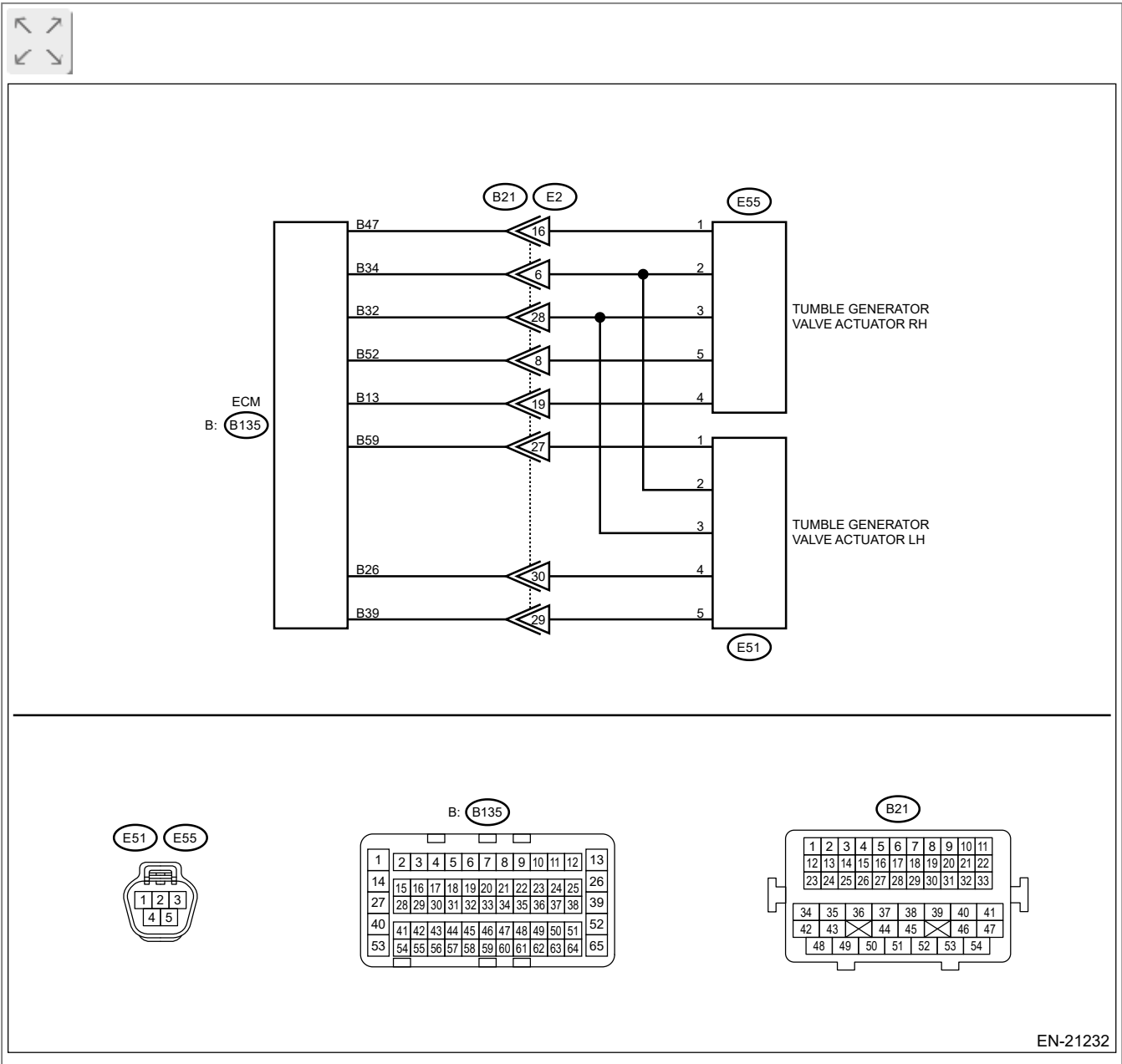
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode. and Inspection Mode Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B135) No. 52 (+) – Chassis ground (-):


(B135) No. 13 (+) – Chassis ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in harness between ECM connector and tumble generator valve actuator RH connector.

No

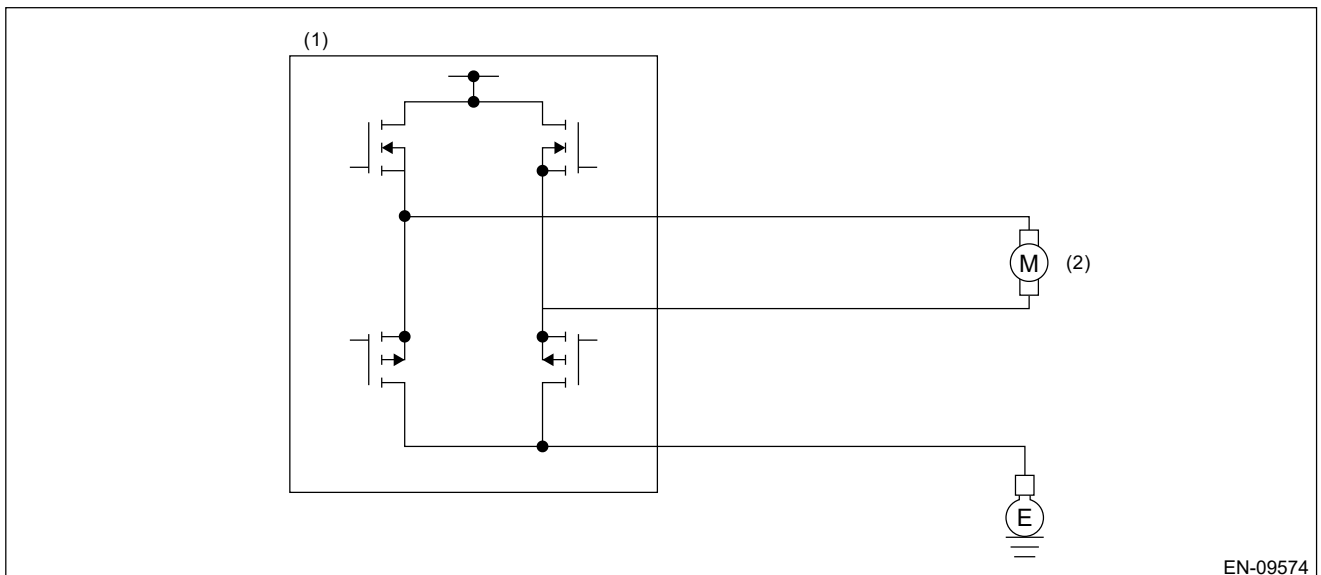
Replace the tumble generator valve actuator RH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Tumble Generator Valve Actuator.](#)

1. OUTLINE OF DIAGNOSIS

Detect the short circuit of tumble generator valve motor.

Judge as NG when the overcurrent signal is sent from IC after tumble generator valve driving IC diagnosis.

2. COMPONENT DESCRIPTION



EN-09574

(1) Engine control module (ECM) (2) Tumble generator valve

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
----------------------	---------------------

Battery voltage	≥ 10.9 V
Tumble generator valve drive signal	Open or Closed

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

At the main IC, check the received signal at each timing which occurs just before the tumble generator valve output is set to OFF → ON, and judge overcurrent NG when the overcurrent NG signal is sent 1000 ms in a row.

Judgment value

Malfunction Criteria	Threshold Value
Overcurrent signal from tumble generator valve drive IC	ON

Time needed for diagnosis: 1000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2011 TGV CONTROL CIRCUIT/OPEN BANK 2

DTC detecting condition:

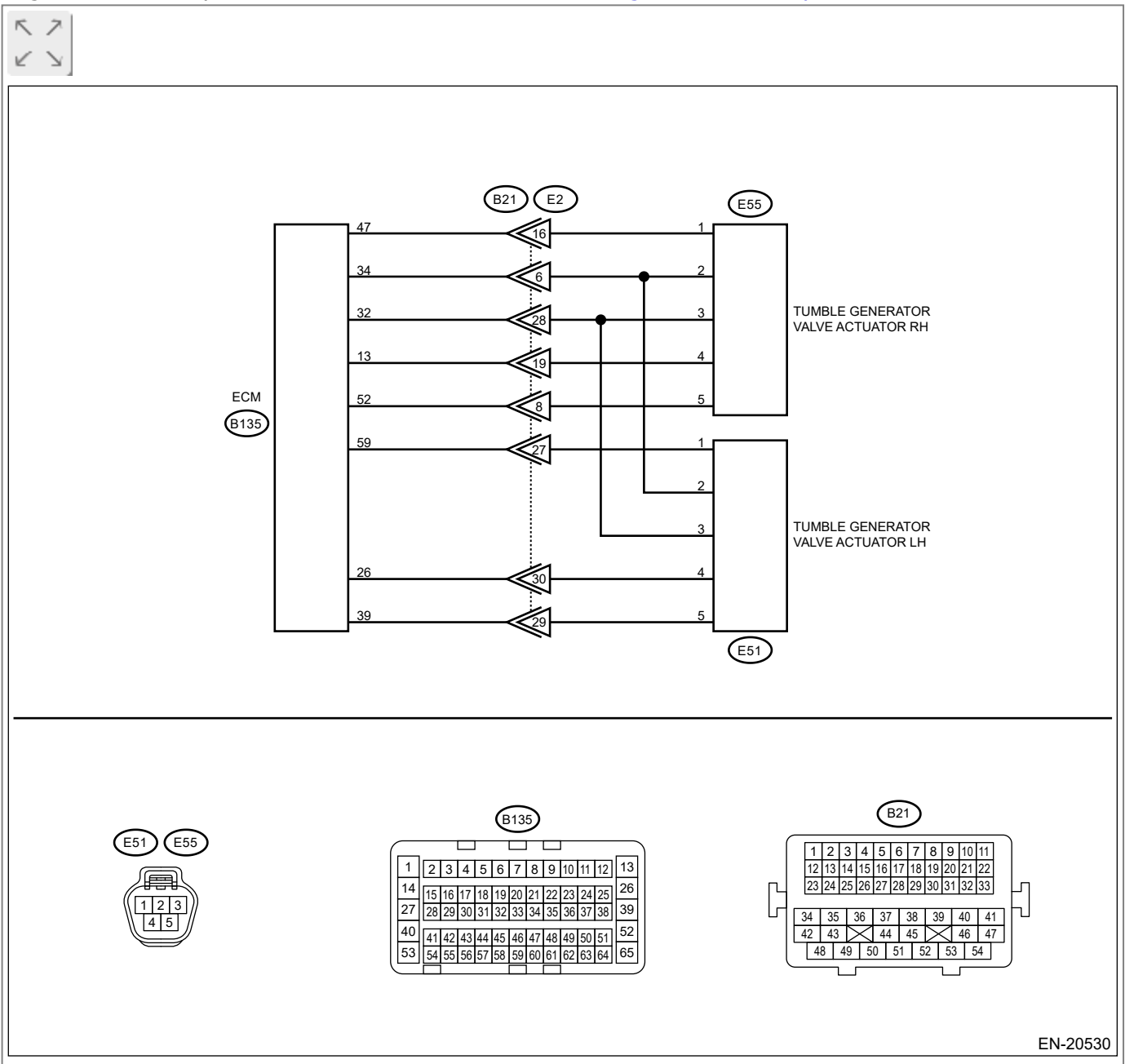
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform **Clear Memory**  **Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode**  **Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..**
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  **Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.**



1. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ASSEMBLY LH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from tumble generator valve assembly LH.
4. Measure the resistance of harness between ECM connector and tumble generator valve assembly LH connector.

Connector & terminal

(B135) No. 39 — (E51) No. 5:

(B135) No. 26 — (E51) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 2.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- Open circuit in harness between ECM connector and tumble generator valve assembly LH connector
- Poor contact of coupling connector

2. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ASSEMBLY LH CONNECTOR.

Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B135) No. 39 — Chassis ground:

(B135) No. 26 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 3.](#)

No

Repair the short circuit to ground in harness between ECM connector and tumble generator valve assembly LH connector.

3. CHECK FOR POOR CONTACT.


Check for poor contact of tumble generator valve assembly LH connector.

Is there poor contact of the tumble generator valve assembly LH connector?

Yes


Repair the poor contact of tumble generator valve assembly LH connector.

No

Replace the tumble generator valve assembly LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Tumble Generator Valve.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P2008.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P2008 TGV CONTROL CIRCUIT/OPEN BANK 1.](#)



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2012 TGV CONTROL CIRCUIT LOW BANK 2

DTC detecting condition:

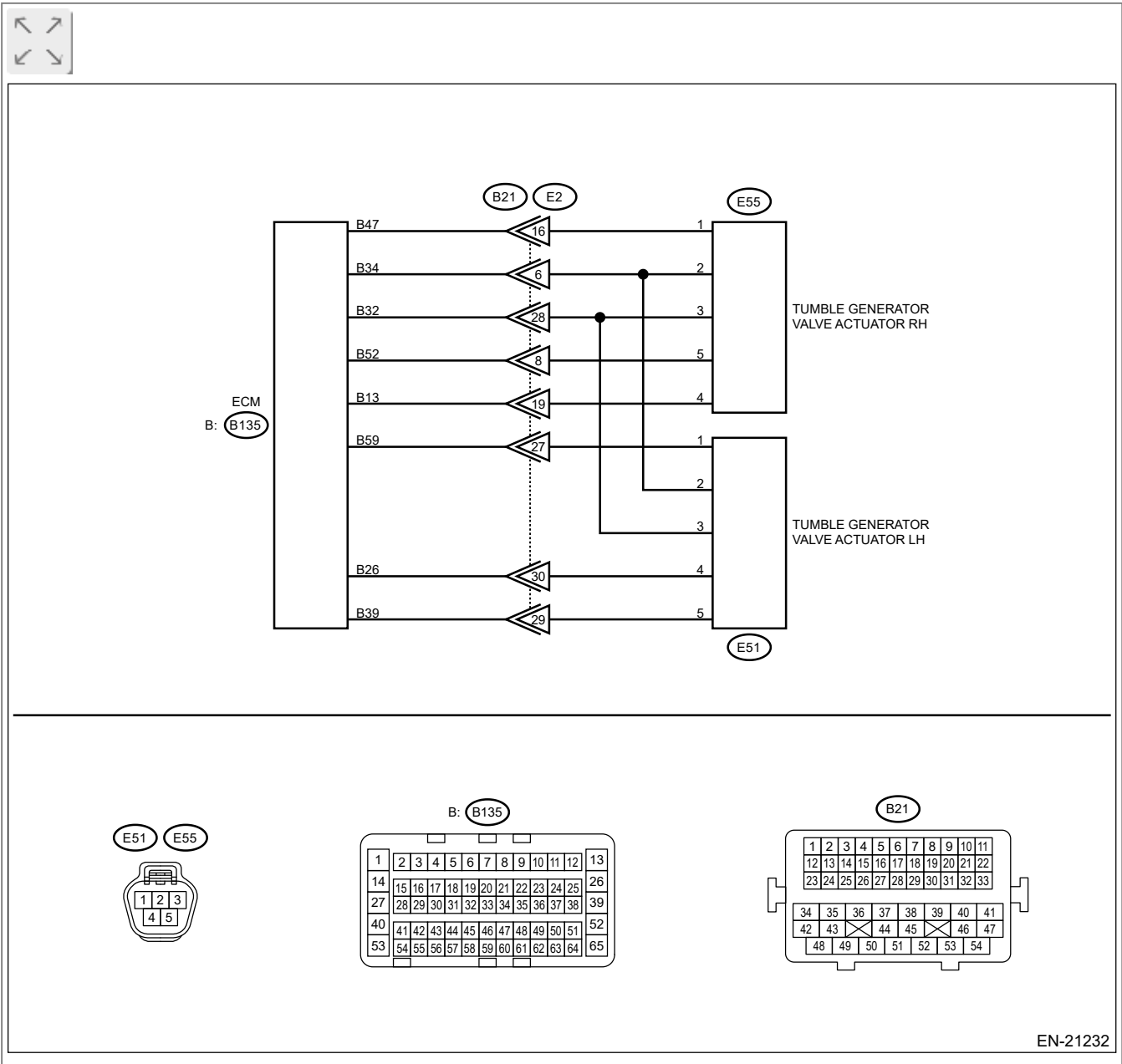
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR LH CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B135) No. 39 (+) – Chassis ground (-):


(B135) No. 26 (+) – Chassis ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in harness between ECM connector and tumble generator valve actuator LH connector.

No

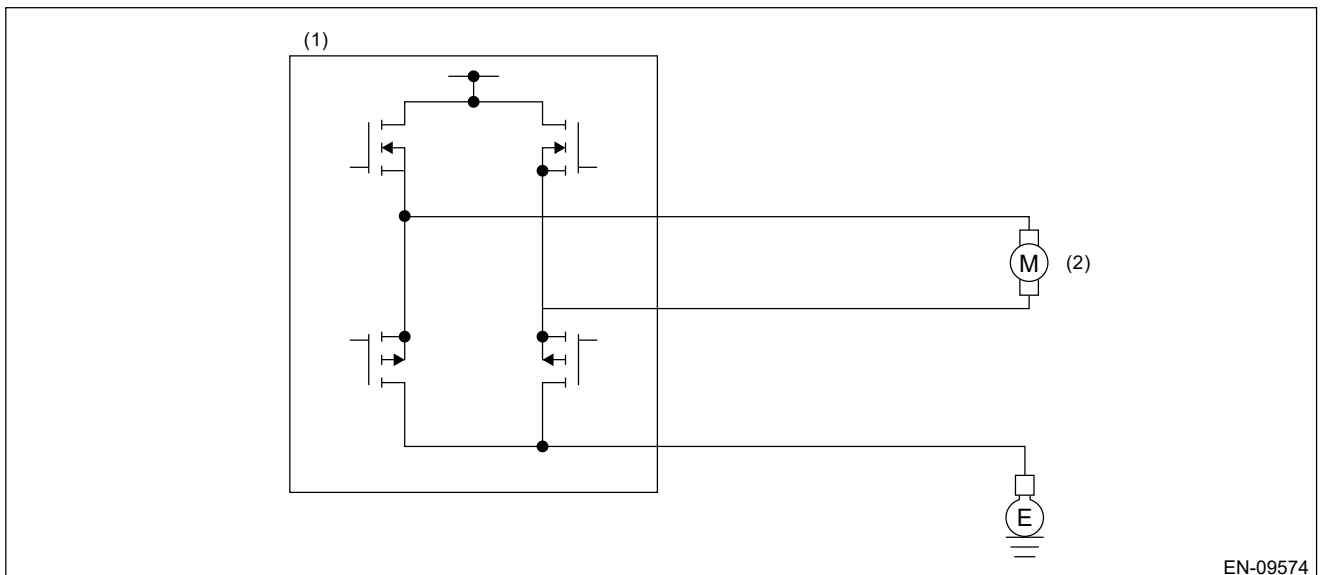
Replace the tumble generator valve actuator LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Tumble Generator Valve Actuator.](#)

1. OUTLINE OF DIAGNOSIS

Detect the short circuit of tumble generator valve motor.

Judge as NG when the overcurrent signal is sent from IC after tumble generator valve driving IC diagnosis.

2. COMPONENT DESCRIPTION



3. EXECUTION CONDITION

Secondary Parameters	Execution condition
----------------------	---------------------

Battery voltage	≥ 10.9 V
Tumble generator valve drive signal	Open or Closed

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

At the main IC, check the received signal at each timing which occurs just before the tumble generator valve output is set to OFF → ON, and judge overcurrent NG when the overcurrent NG signal is sent 1000 ms in a row.

Judgment value

Malfunction Criteria	Threshold Value
Overcurrent signal from tumble generator valve drive IC	ON

Time needed for diagnosis: 1000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2016 TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 1



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Engine stalls.
- Poor driving performance

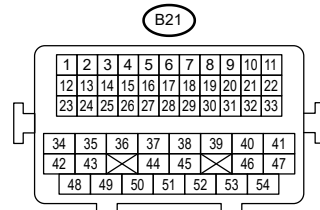
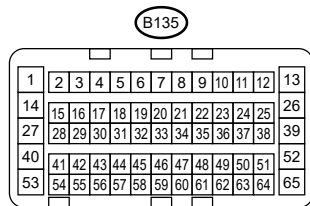
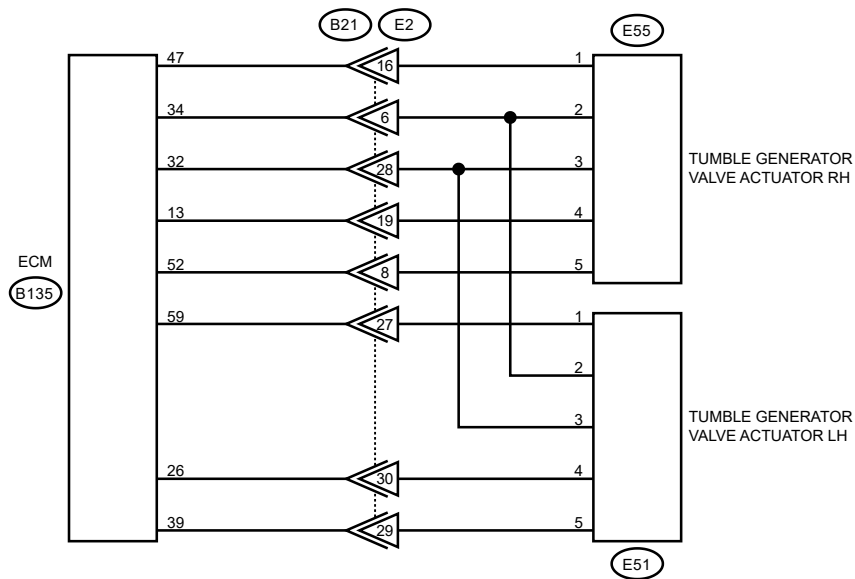
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-20530

1. CHECK CURRENT DATA.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [TGV Position Sensor R].

Note:

For detailed operation procedures, refer to the Data Monitor. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Is the value of [TGV Position Sensor R] less than 0.2 V?

Yes

[Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK POWER SUPPLY OF TUMBLE GENERATOR VALVE ACTUATOR RH.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from tumble generator valve actuator RH.
3. Turn the ignition switch to ON.
4. Measure the voltage between tumble generator valve actuator RH connector and engine ground.

Connector & terminal

(E55) No. 3 (+) — Engine ground (-):

Is the voltage 4.5 V or more?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and tumble generator valve actuator RH connector**
- **Poor contact of ECM connector**

3. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and tumble generator valve actuator RH connector.

Connector & terminal

(B135) No. 47 — (E55) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Repair the open circuit in harness between ECM connector and tumble generator valve actuator RH connector.

4. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH CONNECTOR.




Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(B135) No. 47 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM connector and tumble generator valve actuator RH connector.

5. CHECK FOR POOR CONTACT.




Check for poor contact of ECM and tumble generator valve actuator RH connector.

Is there poor contact of ECM or the tumble generator valve actuator RH connector?

Yes

Repair the poor contact of ECM or tumble generator valve actuator RH connector.

No

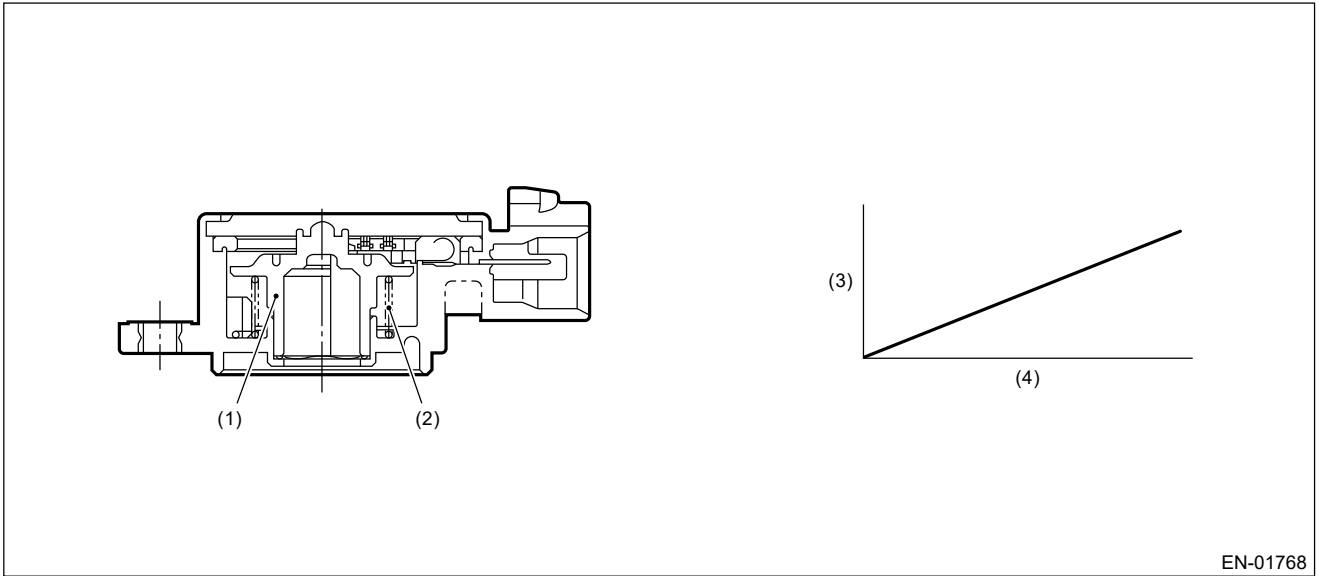
Replace the tumble generator valve actuator RH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Tumble Generator Valve Actuator.](#)

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of tumble generator valve position sensor.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-01768

(1) Rotor

(3) Voltage (V)

(4) Tumble generator valve opening angle (°)

(2) Return spring

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	< 0.213V

Time needed for diagnosis: 500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2017 TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 1



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Engine stalls.
- Poor driving performance

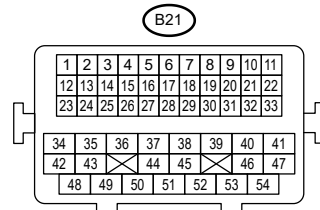
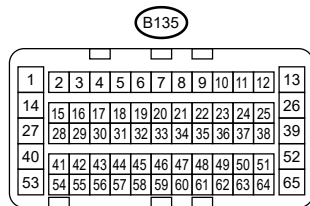
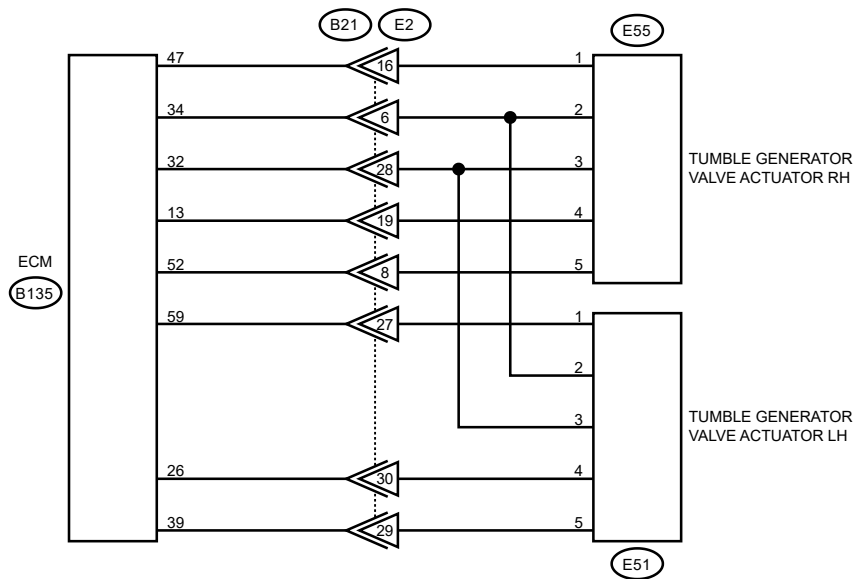
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-20530

1. CHECK CURRENT DATA.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [TGV Position Sensor R].

Note:

For detailed operation procedures, refer to the Data Monitor. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Is the value of [TGV Position Sensor R] 5 V or more?

Yes

[Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.


Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from tumble generator valve actuator RH.
3. Start the engine.
4. Using the Subaru Select Monitor, read the value in [TGV Position Sensor R].

Note:

For detailed operation procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Is the value of [TGV Position Sensor R] 5 V or more?

Yes

Repair the short circuit to power in harness between ECM connector and tumble generator valve actuator RH connector.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between tumble generator valve actuator RH connector and engine ground.

Connector & terminal

(E55) No. 2 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- Open circuit in harness between ECM connector and tumble generator valve actuator RH connector
- Poor contact of ECM connector

4. CHECK FOR POOR CONTACT.




Check for poor contact of tumble generator valve actuator RH connector.

Is there poor contact of the tumble generator valve actuator RH connector?

Yes

Repair the poor contact of tumble generator valve actuator RH connector.

No

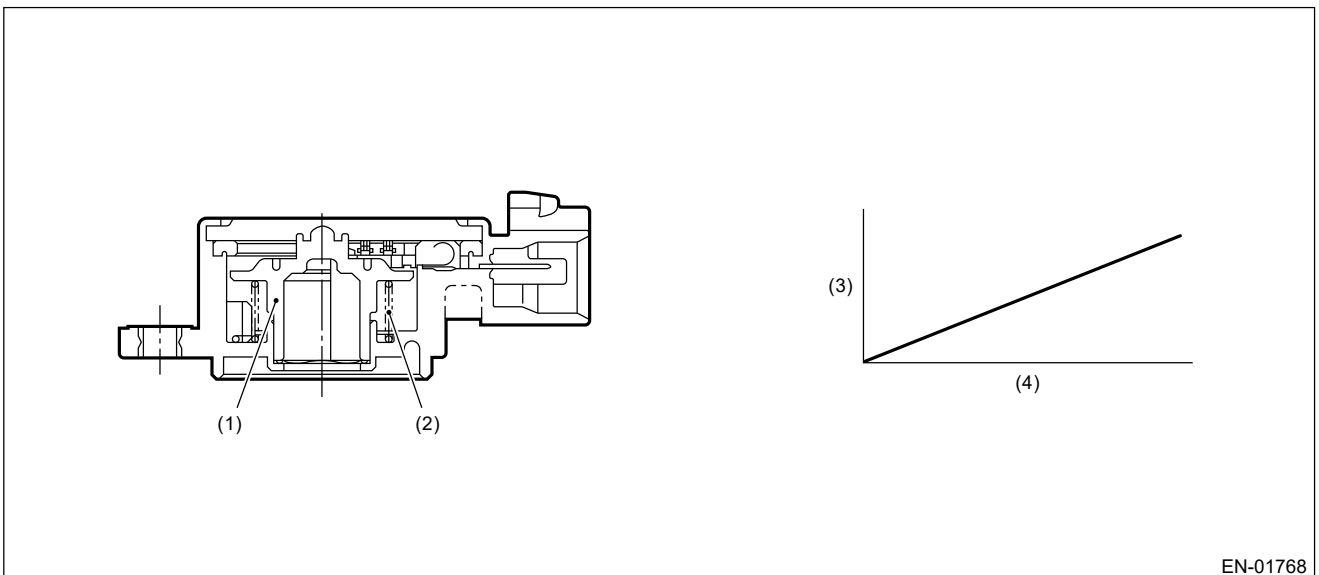
Replace the tumble generator valve actuator RH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Tumble Generator Valve Actuator.](#)

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of tumble generator valve position sensor.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Rotor

(3) Voltage (V)

(4) Tumble generator valve opening angle (°)

(2) Return spring

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$\geq 4.757V$

Time needed for diagnosis: 500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2021 TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 2



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Engine stalls.
- Poor driving performance

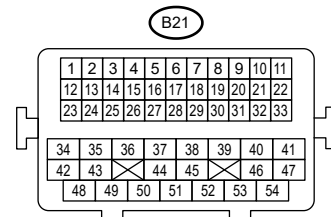
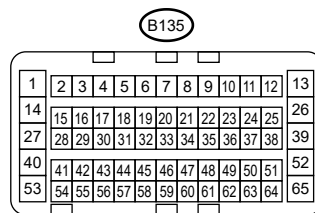
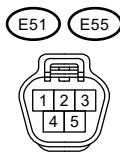
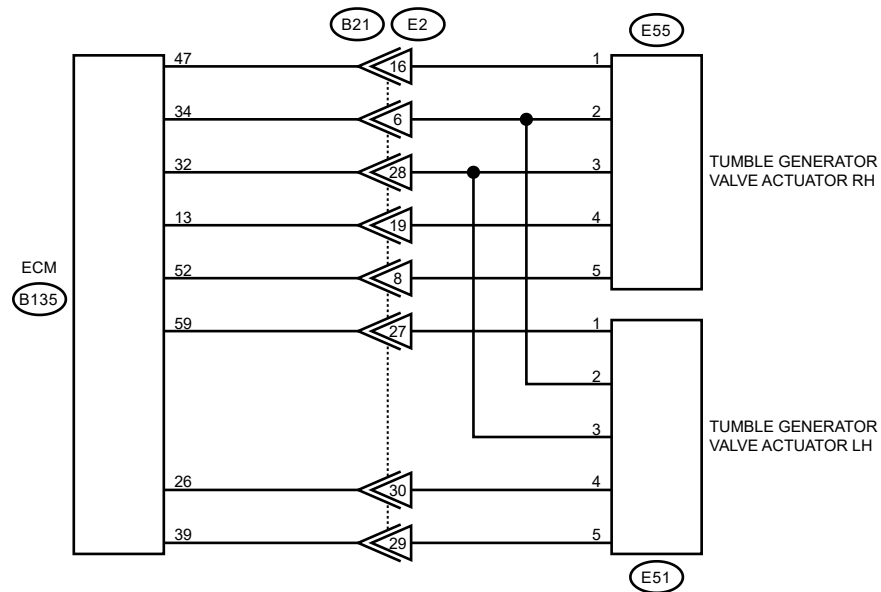
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-20530

1. CHECK CURRENT DATA.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [TGV Position Sensor R].

Note:

For detailed operation procedures, refer to the Data Monitor. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Is the value of [TGV Position Sensor R] 5 V or more?

Yes

[Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this

time. Reproduce the failure, and then perform the diagnosis again.


Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from tumble generator valve actuator RH.
3. Start the engine.
4. Using the Subaru Select Monitor, read the value in [TGV Position Sensor R].

Note:

For detailed operation procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Is the value of [TGV Position Sensor R] 5 V or more?

Yes

Repair the short circuit to power in harness between ECM connector and tumble generator valve actuator RH connector.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between tumble generator valve actuator RH connector and engine ground.

Connector & terminal

(E55) No. 2 — Engine ground:

Is the resistance less than 5 Ω?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and tumble generator valve actuator RH connector**
- **Poor contact of ECM connector**

4. CHECK FOR POOR CONTACT.


Check for poor contact of tumble generator valve actuator RH connector.

Is there poor contact of the tumble generator valve actuator RH connector?

Yes


Repair the poor contact of tumble generator valve actuator RH connector.

No

Replace the tumble generator valve actuator RH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Tumble Generator Valve Actuator.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P2016.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P2016 TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 1.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2022 TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 2



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Engine stalls.
- Poor driving performance

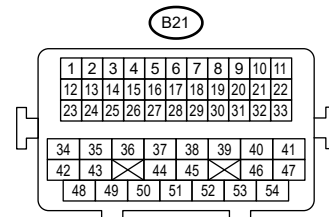
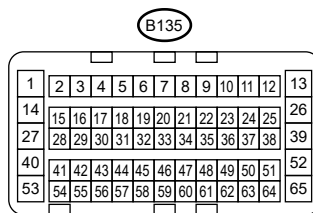
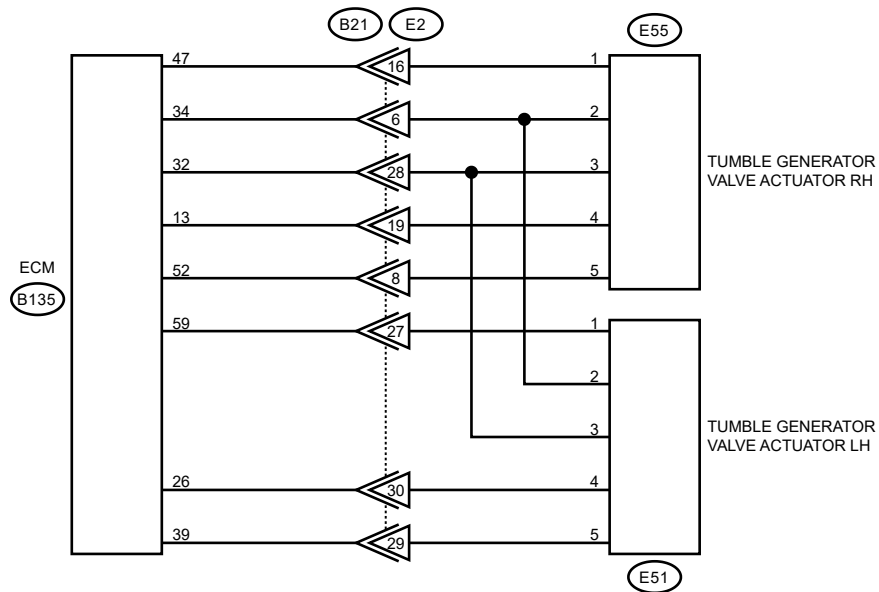
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-20530

1. CHECK CURRENT DATA.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [TGV Position Sensor L].

Note:

For detailed operation procedures, refer to the Data Monitor. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Is the value of [TGV Position Sensor L] 5 V or more?

Yes

[Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this

time. Reproduce the failure, and then perform the diagnosis again.


Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR LH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from tumble generator valve actuator LH.
3. Start the engine.
4. Using the Subaru Select Monitor, read the value in [TGV Position Sensor L].

Note:

For detailed operation procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Is the value of [TGV Position Sensor L] 5 V or more?

Yes

Repair the short circuit to power in harness between ECM connector and tumble generator valve actuator LH connector.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR LH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between tumble generator valve actuator LH connector and engine ground.

Connector & terminal

(E51) No. 2 — Engine ground:

Is the resistance less than 5 Ω?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and tumble generator valve actuator LH connector**
- **Poor contact of ECM connector**

4. CHECK FOR POOR CONTACT.


Check for poor contact of tumble generator valve actuator LH connector.

Is there poor contact of the tumble generator valve actuator LH connector?

Yes

Repair the poor contact of tumble generator valve actuator LH connector.

No

Replace the tumble generator valve actuator LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Tumble Generator Valve Actuator.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P2017.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P2017 TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 1.](#)



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2096 POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1

DTC detecting condition:

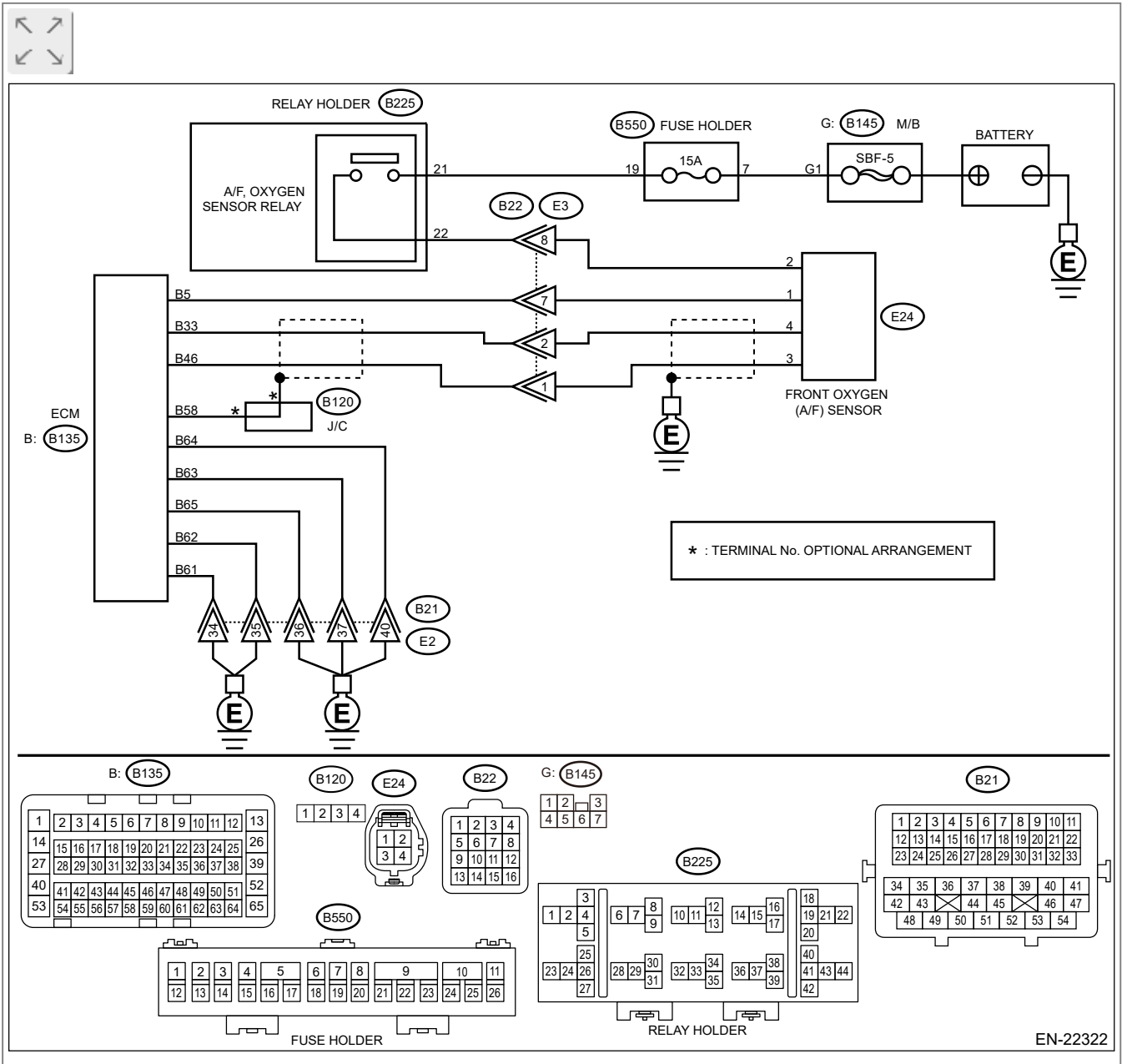
Detected when two consecutive driving cycles with fault occur.

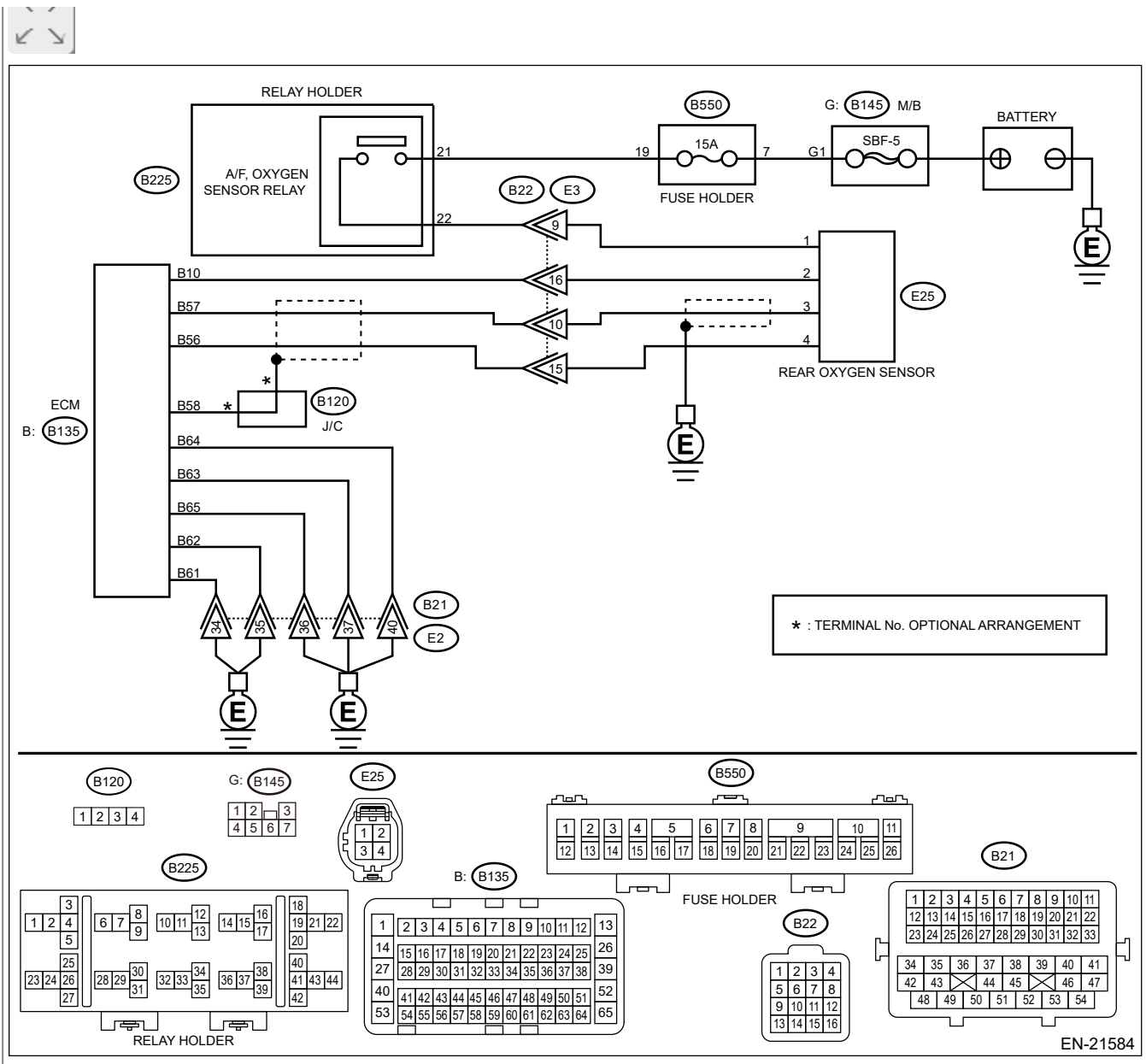
Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





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1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check DTC using "List of Diagnostic Trouble Code (DTC)". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 2.](#)

2. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.

Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

Connector & terminal

(B135) No. 46 — (E24) No. 3:

(B135) No. 33 — (E24) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and front oxygen (A/F) sensor connector**
- **Poor contact of coupling connector**

4. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B135) No. 46 — Chassis ground:

(B135) No. 33 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM connector and front oxygen (A/F) sensor connector.

5. CHECK OUTPUT SIGNAL FOR ECM.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.

Connector & terminal


(E24) No. 3 (+) — Chassis ground (–):

Is the voltage 4.5 V or more?

Yes

 [Go to 7.](#)

No

 [Go to 6.](#)

6. CHECK OUTPUT SIGNAL FOR ECM.

Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.

Connector & terminal

(E24) No. 4 (+) — Chassis ground (–):

Is the voltage 4.95 V or more?

Yes

 [Go to 7.](#)

No

 [Go to 8.](#)

7. CHECK OUTPUT SIGNAL FOR ECM.

Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.


Connector & terminal

(E24) No. 3 (+) — Chassis ground (–):

(E24) No. 4 (+) — Chassis ground (–):

Is the voltage 8 V or more?

Yes

Repair the short circuit to power in the harness between ECM connector and front oxygen (A/F) sensor connector. After repair, replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)

No

Repair the poor contact of ECM connector.

8. CHECK EXHAUST SYSTEM.



Are there holes or loose bolts on exhaust system?

Yes

Repair the exhaust system.

No

[Go to 9.](#)

9. CHECK AIR INTAKE SYSTEM.



Are there holes, loose bolts or disconnection of hose on air intake system?

Yes

Repair the air intake system.

No

[Go to 10.](#)

10. CHECK FUEL PRESSURE.



Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.

1. Connect the front oxygen (A/F) sensor connector.
2. Measure the fuel pressure. [Ref. to MECHANICAL\(H4DO\)>Fuel Pressure>INSPECTION.](#)

Caution:

Release fuel pressure before removing the fuel pressure gauge.

Is the measured value 340 — 400 kPa (3.5 — 4.1 kg/cm², 49 — 58 psi)?

Yes

[Go to 11.](#)

No


Check the fuel pump and fuel delivery line. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Pump>INSPECTION.](#) [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Delivery and Evaporation Lines>INSPECTION.](#)

11. CHECK ENGINE COOLANT TEMPERATURE SENSOR.




1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Coolant Temp.].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Coolant Temp.] 75°C (167°F) or more?

Yes

 [Go to 12.](#)


No

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Coolant Temperature Sensor.](#)

12. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. For CVT models, set the select lever to "P" range or "N" range, and for MT models, place the shift lever in the neutral position.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Read the value of Mass Air Flow using the Subaru Select Monitor or a general scan tool.

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of intake air amount 2.0 — 5.0 g/s (0.26 — 0.66 lb/m)?

Yes

 [Go to 13.](#)


No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

13. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.


1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. For CVT models, set the select lever to "P" range or "N" range, and for MT models, place the shift lever in the neutral position.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Open the front hood.
6. Measure the ambient temperature.
7. Using the Subaru Select Monitor or a general scan tool, read the value of [Intake Air Temp.].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Subtract ambient temperature from [Intake Air Temp.]. Is the obtained value -10 — 50°C (-18 — 90°F)?

Yes

 [Go to 14.](#)


No

Check the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

14. CHECK REAR OXYGEN SENSOR DATA.


1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and keep the engine speed at 3,000 rpm. (2 minutes maximum)
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

Note:


- **Depress the clutch pedal. (MT model)**
- **Subaru Select Monitor**
For detailed procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Oxygen sensor #12] 0.490 V or more?

Yes

 [Go to 15.](#)


No

 [Go to 16.](#)

15. CHECK REAR OXYGEN SENSOR DATA.


1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and rapidly reduce the engine speed from 3,000 rpm.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

Note:

- **Depress the clutch pedal. (MT model)**
- **Subaru Select Monitor**
For detailed procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Oxygen sensor #12] 0.250 V or less?

Yes

 [Go to 17.](#)

No

 [Go to 16.](#)


16. CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.

Has water entered the connector?

Yes

Completely remove any water inside.


No

 [Go to 18.](#)

17. CHECK FRONT OXYGEN (A/F) SENSOR USING REAR OXYGEN SENSOR SIGNAL.

1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), then keep the engine idling for 5 minutes or more.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Oxygen sensor #12] kept at 0.250 V or less for 5 minutes or more?

Yes

Replace the front oxygen (A/F) sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Front Oxygen \(A/F\) Sensor.](#)

No

 [Go to 18.](#)

18. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from rear oxygen sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.


Connector & terminal

(B135) No. 57 — (E25) No. 3:

(B135) No. 56 — (E25) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 19.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and rear oxygen sensor connector**
- **Poor contact of coupling connector**

19. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.


1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between rear oxygen sensor connector and chassis ground.

Connector & terminal

(E25) No. 3 (+) — Chassis ground (-):

Is the voltage 0.2 — 0.5 V?

Yes

Replace the rear oxygen sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Rear Oxygen Sensor.](#)

No

repair the harness and connector.

Note:

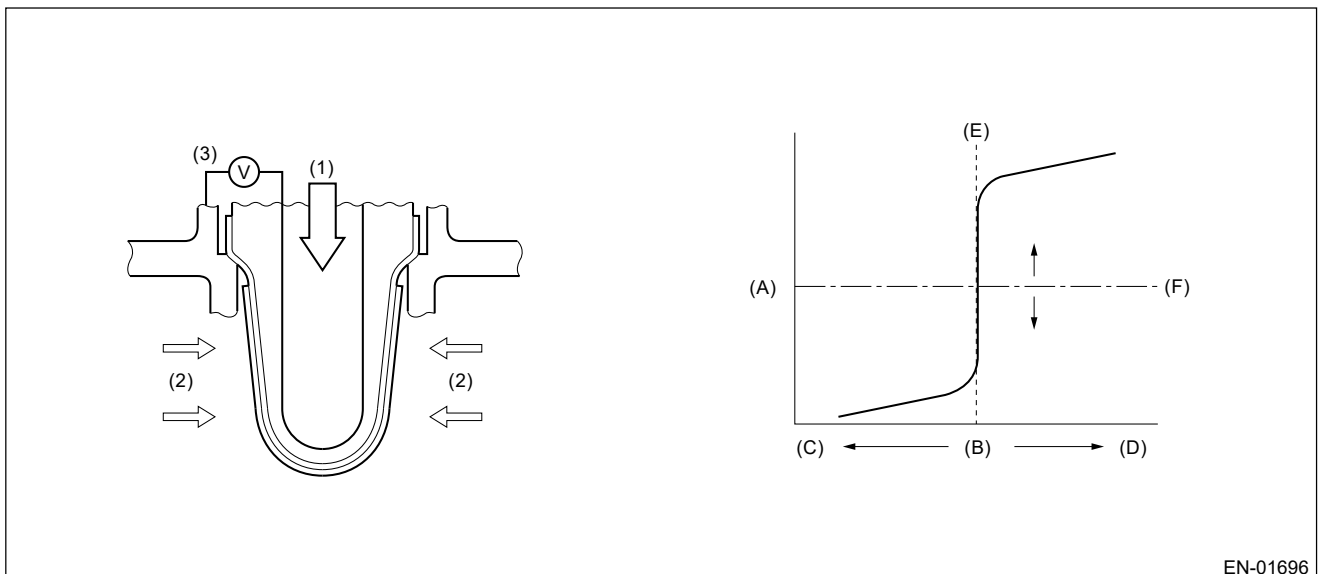
In this case, repair the following item:

- **Open circuit in harness between ECM connector and rear oxygen sensor connector**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of fuel system from the size of the sub feedback learning value.
Control the sub feedback learning and judge as NG when the learning value is in the lean zone.

2. COMPONENT DESCRIPTION



(A) Electromotive force

(B) Air fuel ratio

(C) Lean

(D) Rich

(E) Theoretical air fuel ratio

(F) Comparative voltage

(1) Atmosphere

(2) Exhaust gas

(3) Electromotive force

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3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Sub feedback	In operation

Amount of intake air	≥ 10g/s (0.35oz/s)
Load change every 0.5 engine revs.	< 0.02g/rev (0oz/rev)
Estimated temperature of the rear oxygen sensor element	≥ 500° (932°F)
Stoichiometric integrated intake air amount	≥ 450 g (15.9 oz)

4. GENERAL DRIVING CYCLE

Perform the diagnosis every time after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sub feedback learning value	< -0.04 (CVT model) < -0.04 (MT model)

Time needed for diagnosis: 1s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2097 POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1

DTC detecting condition:

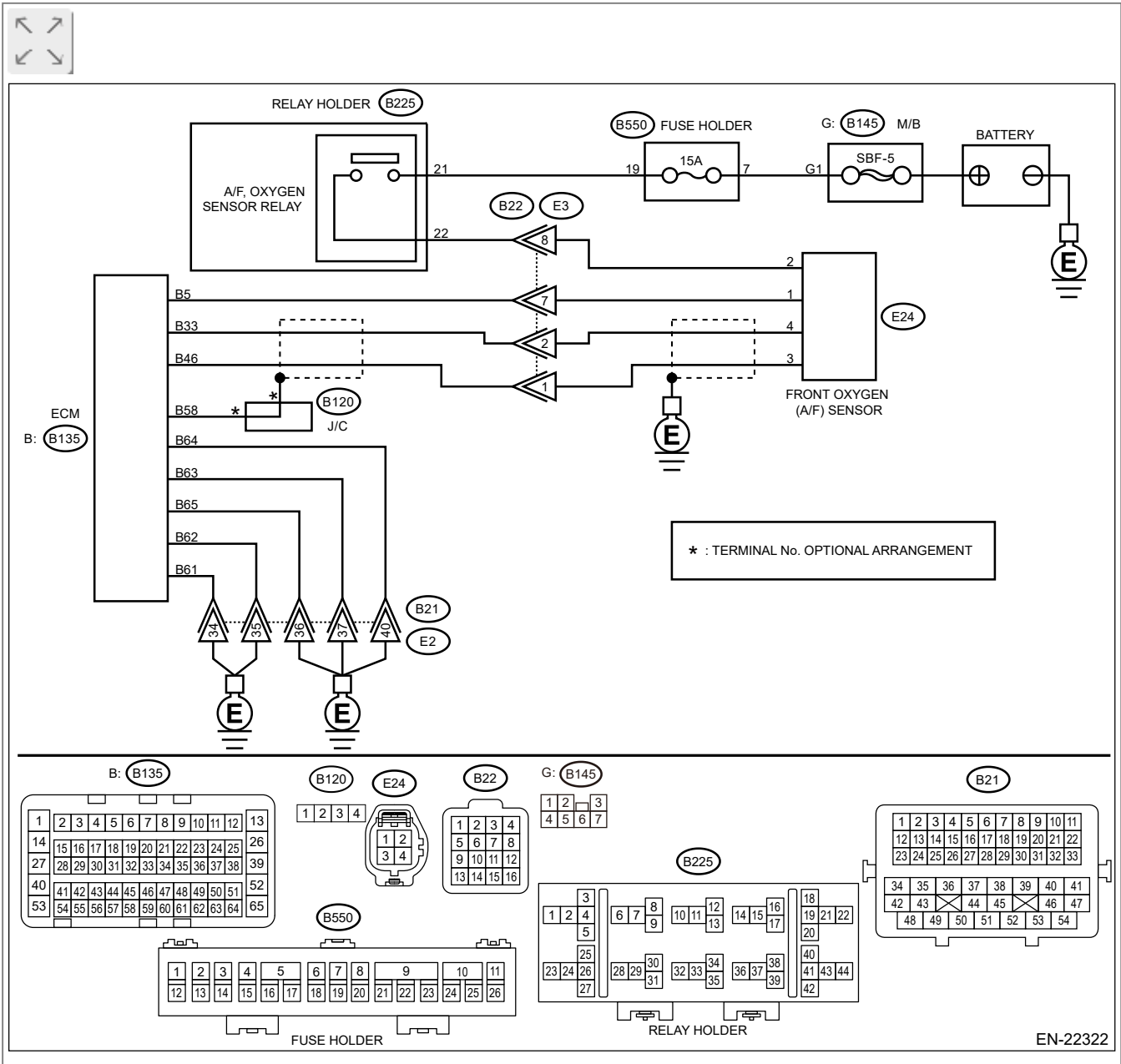
Detected when two consecutive driving cycles with fault occur.

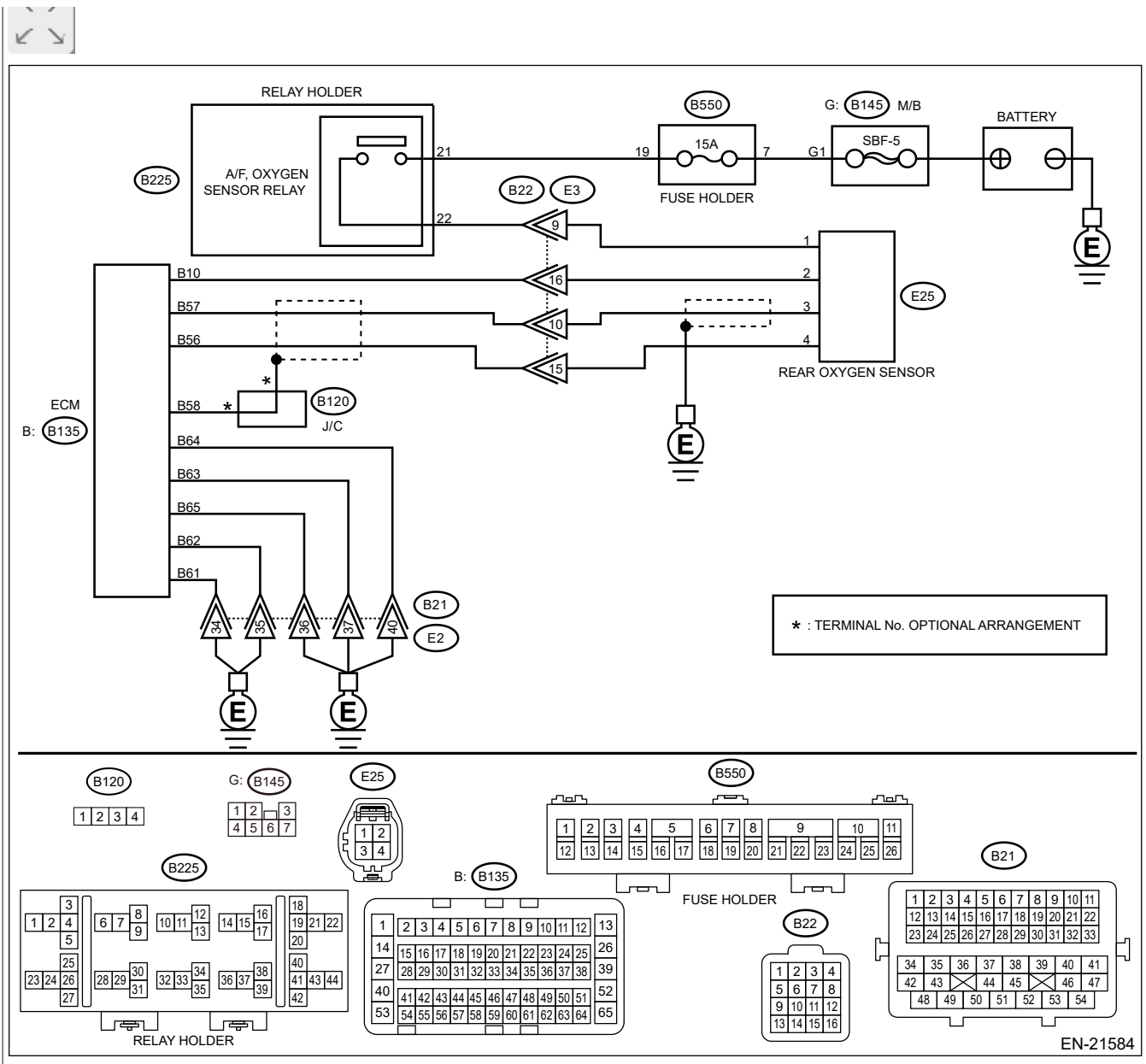
Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check DTC using "List of Diagnostic Trouble Code (DTC)". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 2.](#)

2. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.

Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

Connector & terminal

(B135) No. 46 — (E24) No. 3:

(B135) No. 33 — (E24) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and front oxygen (A/F) sensor connector**
- **Poor contact of coupling connector**

4. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B135) No. 46 — Chassis ground:

(B135) No. 33 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM connector and front oxygen (A/F) sensor connector.

5. CHECK OUTPUT SIGNAL FOR ECM.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.

Connector & terminal


(E24) No. 3 (+) — Chassis ground (-):

Is the voltage 4.5 V or more?

Yes

 [Go to 7.](#)

No

 [Go to 6.](#)

6. CHECK OUTPUT SIGNAL FOR ECM.

Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.

Connector & terminal

(E24) No. 4 (+) — Chassis ground (-):

Is the voltage 4.95 V or more?

Yes

 [Go to 7.](#)

No

 [Go to 8.](#)

7. CHECK OUTPUT SIGNAL FOR ECM.

Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.


Connector & terminal

(E24) No. 3 (+) — Chassis ground (-):

(E24) No. 4 (+) — Chassis ground (-):

Is the voltage 8 V or more?

Yes

Repair the short circuit to power in the harness between ECM connector and front oxygen (A/F) sensor connector. After repair, replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)

No

Repair the poor contact of ECM connector.

8. CHECK EXHAUST SYSTEM.



Are there holes or loose bolts on exhaust system?

Yes

Repair the exhaust system.

No

[Go to 9.](#)

9. CHECK AIR INTAKE SYSTEM.



Are there holes, loose bolts or disconnection of hose on air intake system?

Yes

Repair the air intake system.

No

[Go to 10.](#)

10. CHECK FUEL PRESSURE.



Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.

1. Connect the front oxygen (A/F) sensor connector.
2. Measure the fuel pressure. [Ref. to MECHANICAL\(H4DO\)>Fuel Pressure>INSPECTION.](#)

Caution:

Release fuel pressure before removing the fuel pressure gauge.

Is the measured value 340 — 400 kPa (3.5 — 4.1 kg/cm², 49 — 58 psi)?

Yes

[Go to 11.](#)

No


Check the fuel pump and fuel delivery line. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Pump>INSPECTION.](#) [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Delivery and Evaporation Lines>INSPECTION.](#)

11. CHECK ENGINE COOLANT TEMPERATURE SENSOR.




1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Coolant Temp.].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Coolant Temp.] 75°C (167°F) or more?

Yes

 [Go to 12.](#)


No

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Coolant Temperature Sensor.](#)

12. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.


1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. For CVT models, set the select lever to "P" range or "N" range, and for MT models, place the shift lever in the neutral position.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Using the Subaru Select Monitor or a general scan tool, read the value of [Mass Air Flow].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Mass Air Flow] 2.0 — 5.0 g/s (0.26 — 0.66 lb/m)?

Yes

 [Go to 13.](#)


No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

13. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.


1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. For CVT models, set the select lever to "P" range or "N" range, and for MT models, place the shift lever in the neutral position.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Open the front hood.
6. Measure the ambient temperature.
7. Using the Subaru Select Monitor or a general scan tool, read the value of [Intake Air Temp.].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Subtract ambient temperature from [Intake Air Temp.]. Is the obtained value -10 — 50°C (-18 — 90°F)?

Yes

 [Go to 14.](#)


No

Check the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

14. CHECK REAR OXYGEN SENSOR DATA.


1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and keep the engine speed at 3,000 rpm. (2 minutes maximum)
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

Note:


- **Depress the clutch pedal. (MT model)**
- **Subaru Select Monitor**
For detailed procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Oxygen sensor #12] 0.490 V or more?

Yes

 [Go to 15.](#)


No

 [Go to 16.](#)

15. CHECK REAR OXYGEN SENSOR DATA.


1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and rapidly reduce the engine speed from 3,000 rpm.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

Note:

- **Depress the clutch pedal. (MT model)**
- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Oxygen sensor #12] 0.250 V or less?

Yes

 [Go to 17.](#)

No

 [Go to 16.](#)


16. CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.

Has water entered the connector?

Yes

Completely remove any water inside.


No

 [Go to 18.](#)

17. CHECK FRONT OXYGEN (A/F) SENSOR USING REAR OXYGEN SENSOR SIGNAL.

1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), then keep the engine idling for 5 minutes or more.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the voltage of [Oxygen sensor #12] kept at 0.8 V or more for 5 minutes or more?

Yes

Replace the front oxygen (A/F) sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Front Oxygen \(A/F\) Sensor.](#)

No

 [Go to 18.](#)

18. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from rear oxygen sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.


Connector & terminal

(B135) No. 57 — (E25) No. 3:

(B135) No. 56 — (E25) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 19.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and rear oxygen sensor connector**
- **Poor contact of coupling connector**

19. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.


1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between rear oxygen sensor connector and chassis ground.

Connector & terminal

(E25) No. 3 (+) — Chassis ground (-):

Is the voltage 0.2 — 0.5 V?

Yes

Replace the rear oxygen sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Rear Oxygen Sensor.](#)

No

repair the harness and connector.

Note:

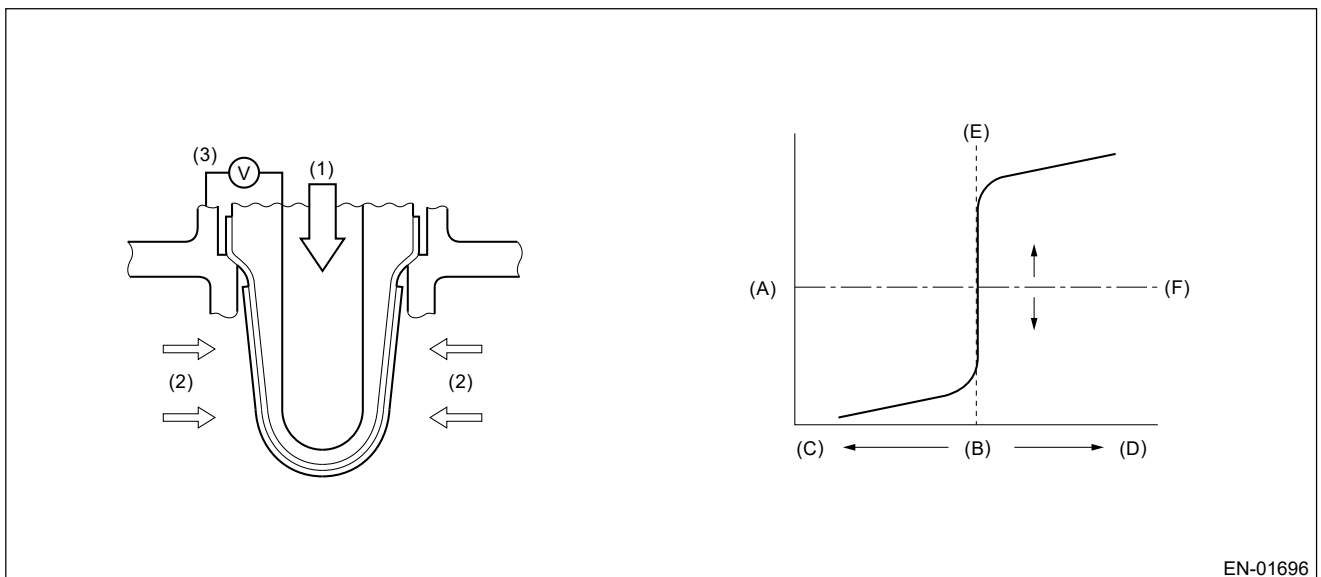
In this case, repair the following item:

- **Open circuit in harness between ECM connector and rear oxygen sensor connector**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of fuel system from the size of the sub feedback learning value.
Sub feedback learning is being performed. When the learning value goes to the rich side, judge as NG.

2. COMPONENT DESCRIPTION



(A) Electromotive force

(B) Air fuel ratio

(C) Lean

(D) Rich

(E) Theoretical air fuel ratio

(F) Comparative voltage

(1) Atmosphere

(2) Exhaust gas

(3) Electromotive force

3. EXECUTION CONDITION

Secondary Parameters	Execution condition

Sub feedback	In operation
Amount of intake air	≥ 10g/s (0.35oz/s)
Load change every 0.5 engine revs.	< 0.02g/rev (0oz/rev)
Estimated temperature of the rear oxygen sensor element	≥ 500° (932°F)
Stoichiometric integrated intake air amount	≥ 450 g (15.9 oz)

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously when the vehicle is idling or running at a constant speed of 80 km/h (50 MPH) or more.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sub feedback learning value	≥ 0.041 (CVT model) ≥ 0.041 (MT model)

Time needed for diagnosis: 1s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2101 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE


DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance
- Engine stalls.

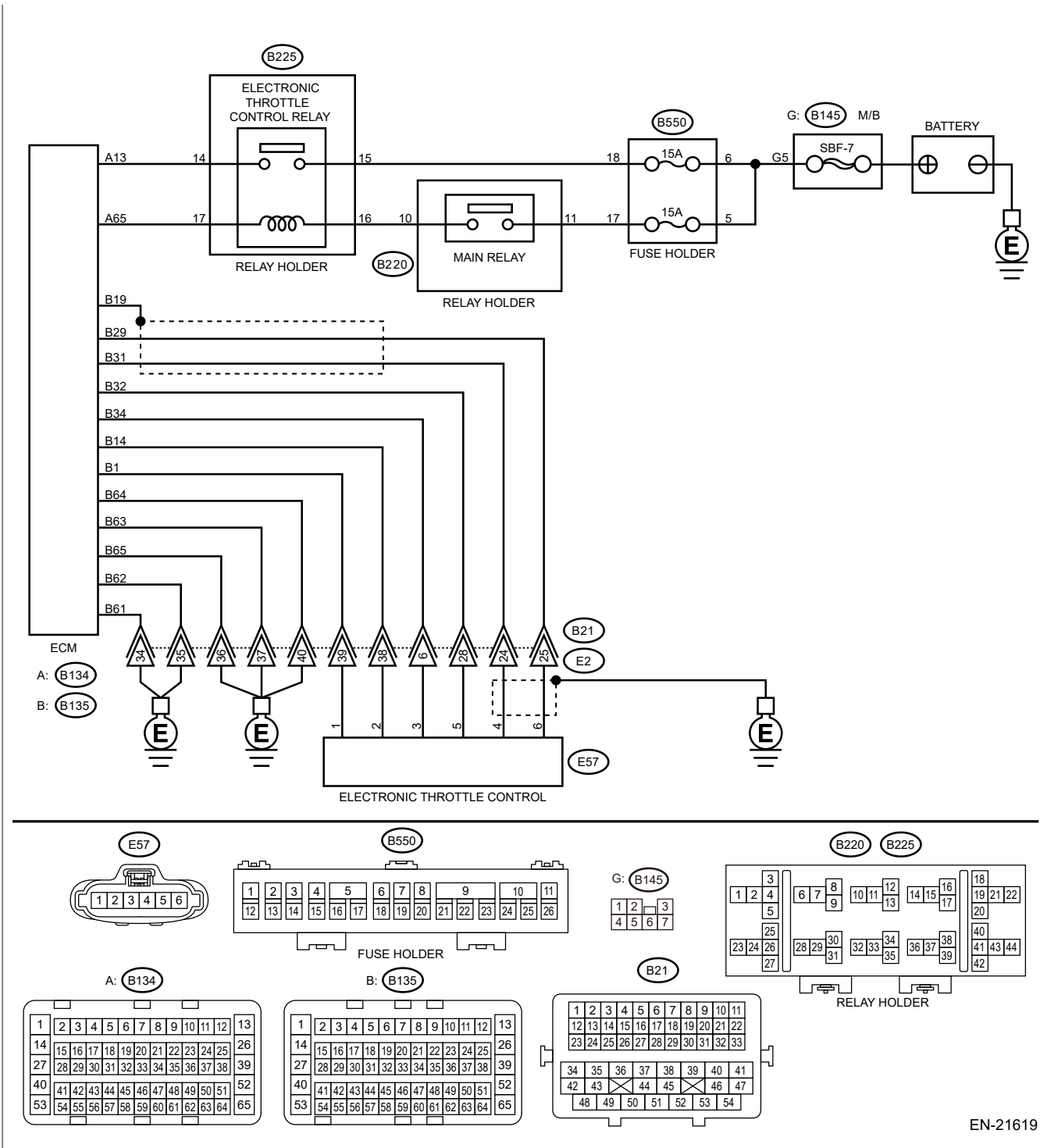
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode. and Inspection Mode !\[\]\(5ed985c65f50e5350eeeb77f03c2e095_img.jpg\) \[Ref. to ENGINE \\(DIAGNOSTICS\\)\\(H4DO\\)>Inspection Mode.\]\(#\)](#)**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





EN-21619

1. CHECK ELECTRONIC THROTTLE CONTROL RELAY.

1. Turn the ignition switch to OFF.
2. Remove the electronic throttle control relay.
3. Connect the battery to terminals No. 16 and No. 17 of electronic throttle control relay.
4. Measure the resistance between electronic throttle control relay terminals.


Terminals




No. 14 —No. 15:

Is the resistance less than 1 Ω ?

Yes

 [Go to 2.](#)

No

Replace the electronic throttle control relay.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Electronic Throttle Control Relay.](#)

2. CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY.


Measure the voltage between electronic throttle control relay connector and chassis ground.

Connector & terminal

(B225) No. 15 (+) — Chassis ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 3.](#)

No

Repair the open or short to ground in the power supply circuit.

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY CONNECTOR.

1. Disconnect the connector from ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between electronic throttle control relay connector and chassis ground.

Connector & terminal


(B225) No. 17 (+) — Chassis ground (–):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power in the harness between ECM connector and electronic throttle control relay connector.

No

 [Go to 4.](#)

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the resistance between electronic throttle control relay connector and chassis ground.


Connector & terminal

(B225) No. 14 — Chassis ground:

(B225) No. 17 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM connector and electronic throttle control relay connector.

5. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY CONNECTOR.

Measure the resistance between ECM connector and electronic throttle control relay connector.

Connector & terminal

(B134) No. 65 — (B225) No. 17:

(B134) No. 13 — (B225) No. 14:

Is the resistance less than 1 Ω ?

Yes

 [Go to 6.](#)

No

Repair the open circuit in harness between ECM connector and electronic throttle control relay connector.

6. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from electronic throttle control.
3. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B135) No. 32 — Chassis ground:

(B135) No. 29 — Chassis ground:

(B135) No. 29 — (B137) No. 4:


(B135) No. 31 — Chassis ground:

(B135) No. 31 — (B137) No. 4:

Is the resistance 1 M Ω or more?



Yes

 [Go to 7.](#)

No

Repair the ground short circuit of harness between ECM connector and electronic throttle control connector.

7. CHECK SHORT CIRCUIT INSIDE THE ECM.

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.


Connector & terminal

(E57) No. 6 – Engine ground:


(E57) No. 4 – Engine ground:

Is the resistance 200 k Ω or more?

Yes

 [Go to 8.](#)

No

Repair the ground short circuit of harness between ECM connector and electronic throttle control connector. Replace the ECM if defective.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)

8. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and electronic throttle control connector.

Connector & terminal

(B135) No. 29 – (E57) No. 6:

(B135) No. 31 – (E57) No. 4:

(B135) No. 31 – (E57) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 9.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and electronic throttle control connector**
- **Poor contact of coupling connector**

9. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.




1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 3 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 10.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- Open circuit of harness between ECM connector and engine ground
- Poor contact of ECM connector
- Poor contact of coupling connector

10. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.



1. Turn the ignition switch to ON.
2. Measure the voltage between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 6 (+) — Engine ground (-):


(E57) No. 4 (+) — Engine ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in the harness between ECM connector and electronic throttle control connector.

No

 [Go to 11.](#)

11. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.


Connector & terminal

(B135) No. 32 — (B134) No. 18:

(B135) No. 32 — (B134) No. 28:

Is the resistance 1 M Ω or more?

Yes

 [Go to 12.](#)

No

Repair the short circuit to power in the harness between ECM connector and electronic throttle control connector.

12. CHECK SENSOR OUTPUT.

1. Connect all connectors.
2. Start the engine and warm up completely.
3. Stop the engine, and then turn the ignition switch to ON (engine OFF).
4. Using the Subaru Select Monitor, read the value in [Main-Throttle Sensor].

Note:


For detailed procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)

Is the value of [Main-Throttle Sensor] 0.81 — 0.87 V?

Yes

 [Go to 13.](#)

No

Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Throttle Body.](#)

13. CHECK SENSOR OUTPUT.


Using the Subaru Select Monitor, read the value in [Sub-Throttle Sensor].

Note:


For detailed procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)

Is the value of [Sub-Throttle Sensor] 1.64 — 1.70 V?

Yes

 [Go to 14.](#)

No

Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Throttle Body.](#)

14. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from electronic throttle control.
4. Measure the resistance between ECM connector and electronic throttle control connector.


Connector & terminal

(B135) No. 2 — (E57) No. 2:

(B135) No. 1 — (E57) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 15.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and electronic throttle control connector**
- **Poor contact of coupling connector**

15. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 2 (+) — Engine ground (-):


(E57) No. 1 (+) — Engine ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in the harness between ECM connector and electronic throttle control connector.

No

 [Go to 16.](#)

16. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between electronic throttle control connector and engine ground.


Connector & terminal

(E57) No. 2 — Engine ground:

(E57) No. 1 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 17.](#)

No

Repair the ground short circuit of harness between ECM connector and electronic throttle control connector.

17. CHECK ELECTRONIC THROTTLE CONTROL CONNECTOR HARNESS.




Measure the resistance between electronic throttle control connectors.

Connector & terminal

(E57) No. 2 — (E57) No. 1:

Is the resistance 1 M Ω or more?

Yes

 [Go to 18.](#)

No

Repair the short circuit in harness between ECM connector and electronic throttle control connector.

18. CHECK ELECTRONIC THROTTLE CONTROL GROUND CIRCUIT.



Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B135) No. 61 — Chassis ground:

(B135) No. 62 — Chassis ground:


(B135) No. 63 — Chassis ground:

(B135) No. 64 — Chassis ground:

(B135) No. 65 — Chassis ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 19.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- Open circuit of harness between ECM connector and engine ground
- Poor contact of coupling connector

19. CHECK ELECTRONIC THROTTLE CONTROL.

Measure the resistance between electronic throttle control terminals.

Terminals


No. 2 —No. 1:

Is the resistance 50 Ω or less?

Yes

 [Go to 20.](#)

No

Replace the electronic throttle control.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Throttle Body.](#)

20. CHECK ELECTRONIC THROTTLE CONTROL.


Move the throttle valve to the fully opened and fully closed positions with fingers.
Check that the valve returns to the specified position when releasing fingers.

Does the valve return to the specified position? Standard value: 3 mm (0.12 in) from fully closed position

Yes

Repair the poor contact of ECM connector.

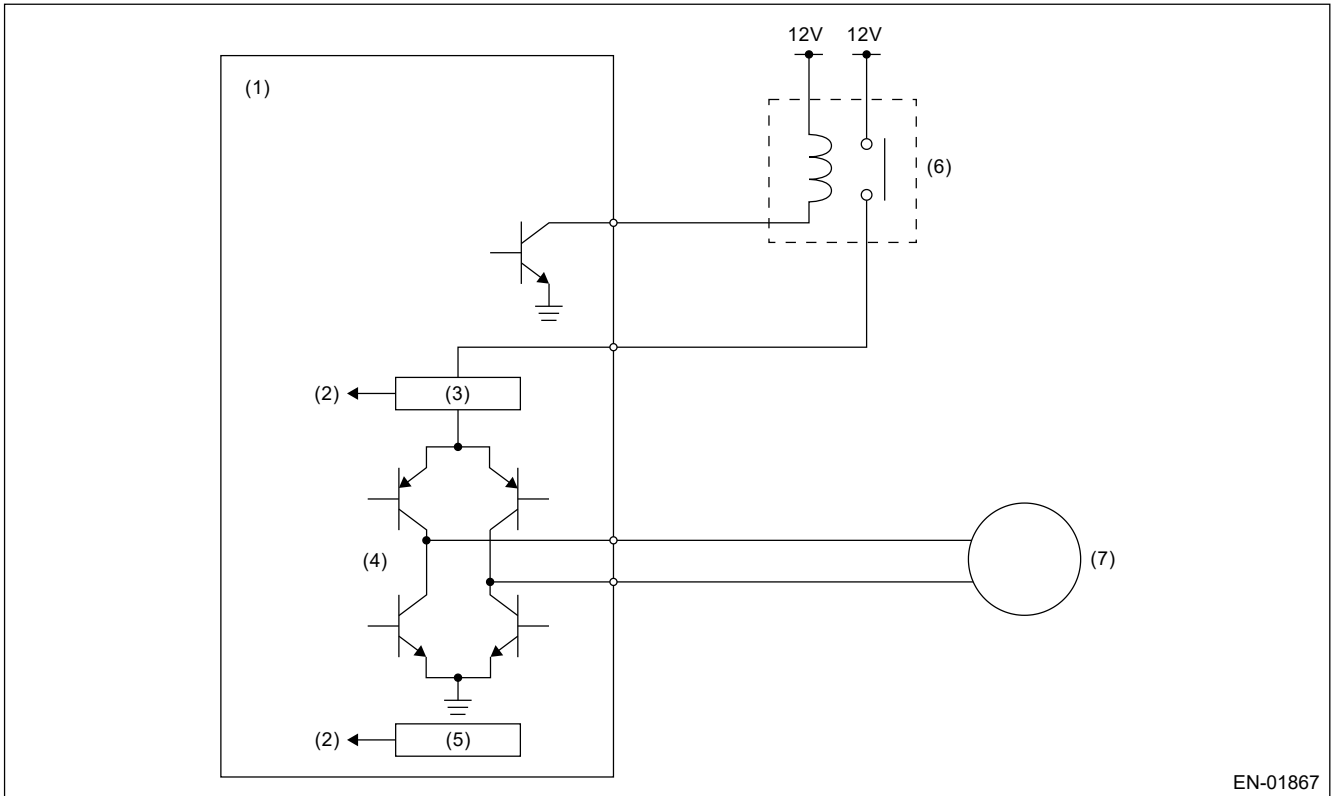
No

Replace the electronic throttle control.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Throttle Body.](#)

1. OUTLINE OF DIAGNOSIS

Judge as NG when the motor current becomes large or drive circuit is heated.

2. COMPONENT DESCRIPTION



EN-01867

- (1) Engine control module (ECM) (4) Drive circuit (6) Electronic throttle control relay
 (2) Detecting circuit (5) Temperature detection circuit (7) Motor
 (3) Overcurrent detection circuit

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 6.2V$
Electronic throttle control relay output	ON

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Overcurrent signal from driver	ON

Time needed for diagnosis: 512ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2102 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT LOW



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance
- Engine stalls.

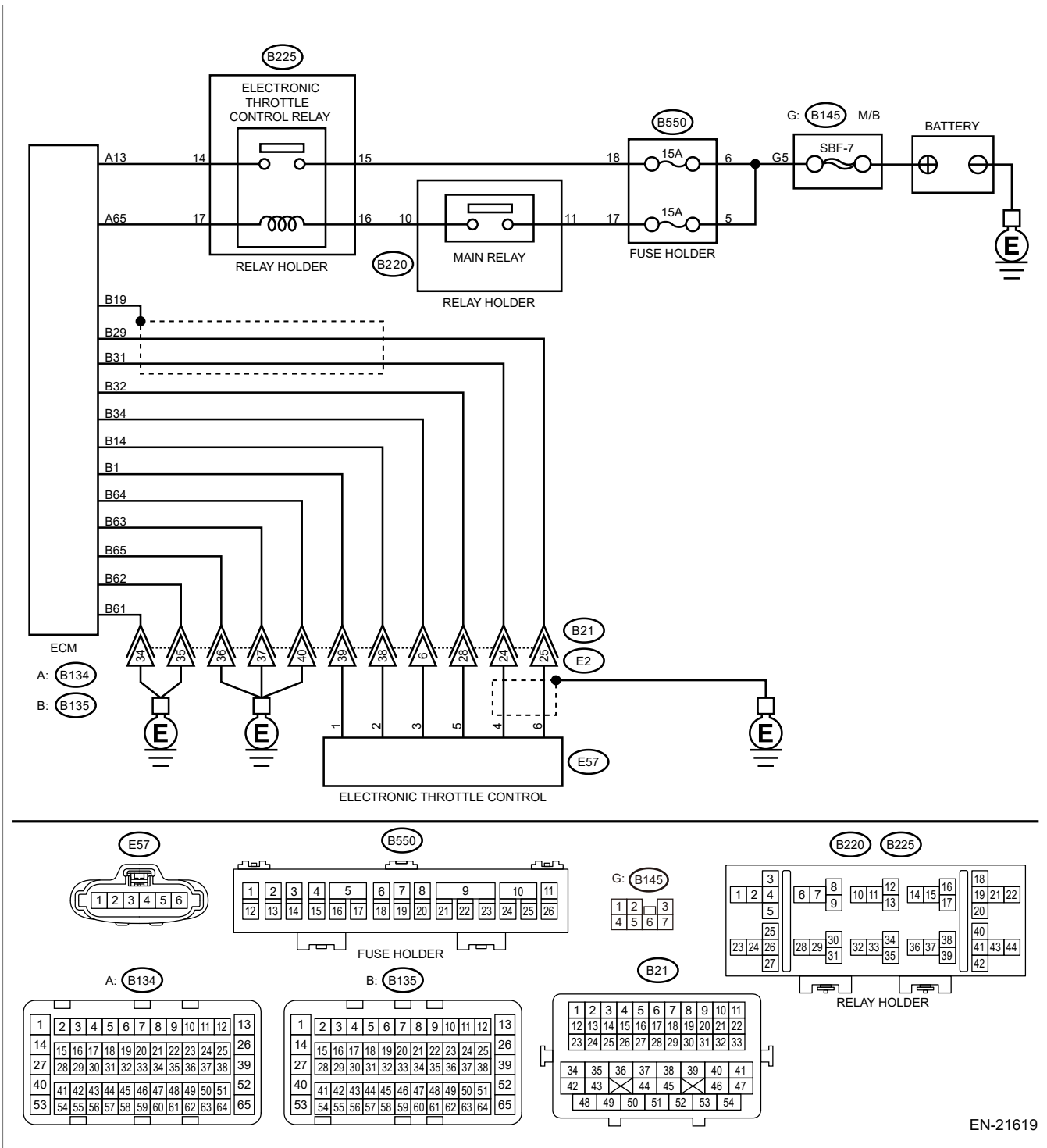
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21619

1. CHECK ELECTRONIC THROTTLE CONTROL RELAY.

1. Turn the ignition switch to OFF.
2. Remove the electronic throttle control relay.
3. Connect the battery to terminals No. 16 and No. 17 of electronic throttle control relay.
4. Measure the resistance between electronic throttle control relay terminals.


Terminals




No. 14 —No. 15:

Is the resistance less than 1 Ω ?

Yes

 [Go to 2.](#)

No

Replace the electronic throttle control relay.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Electronic Throttle Control Relay.](#)

2. CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY.


Measure the voltage between electronic throttle control relay connector and chassis ground.

Connector & terminal

(B225) No. 15 (+) — Chassis ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 3.](#)

No

Repair the open or short to ground in the power supply circuit.

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY CONNECTOR.

1. Disconnect the connector from ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between electronic throttle control relay connector and chassis ground.

Connector & terminal


(B225) No. 17 (+) — Chassis ground (–):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power in the harness between ECM connector and electronic throttle control relay connector.

No

 [Go to 4.](#)

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the resistance between electronic throttle control relay connector and chassis ground.


Connector & terminal

(B225) No. 14 — Chassis ground:

(B225) No. 15 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM connector and electronic throttle control relay connector.

5. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY CONNECTOR.

Measure the resistance between ECM connector and electronic throttle control relay connector.

Connector & terminal

(B134) No. 65 — (B225) No. 17:

(B134) No. 13 — (B225) No. 14:

Is the resistance less than 1 Ω ?

Yes

Repair the poor contact of ECM connector.

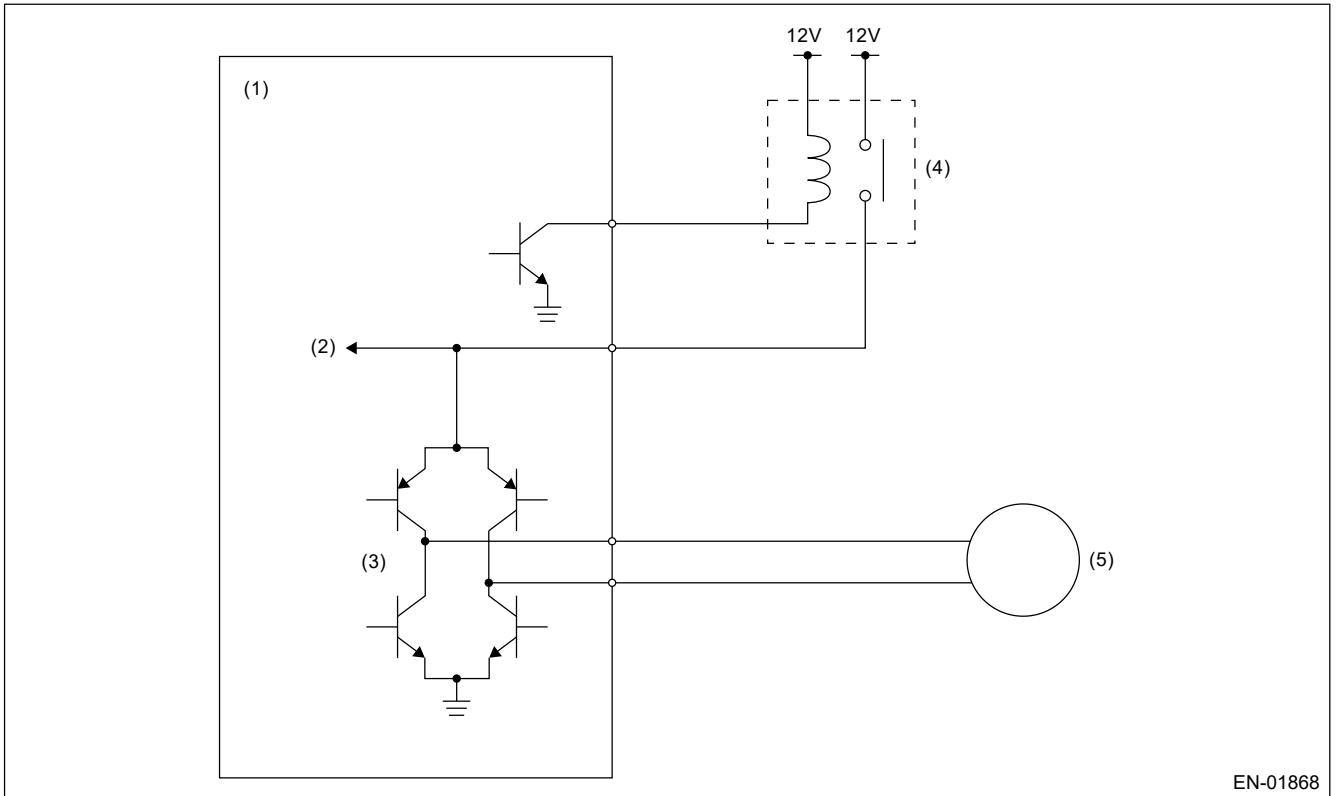
No

Repair the open circuit in harness between ECM connector and electronic throttle control relay connector.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the electronic throttle control power is not supplied even when ECM sets the electric control throttle relay to ON.

2. COMPONENT DESCRIPTION



EN-01868

- (1) Engine control module (ECM) (3) Drive circuit (5) Motor
 (2) Voltage detection circuit (4) Electronic throttle control relay

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 11V$
Electronic throttle control relay output	ON

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Motor power voltage	$\leq 5V$

Time needed for diagnosis: 352ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2103 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

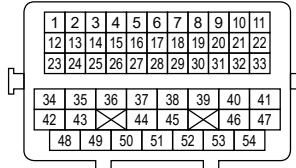
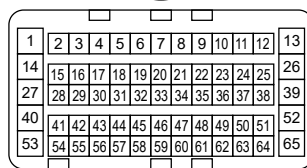
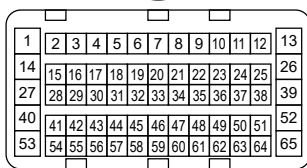
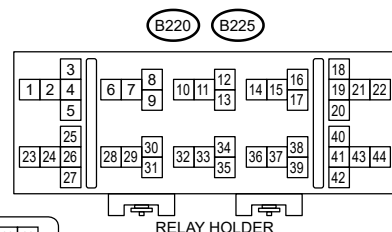
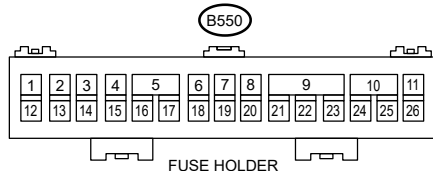
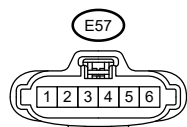
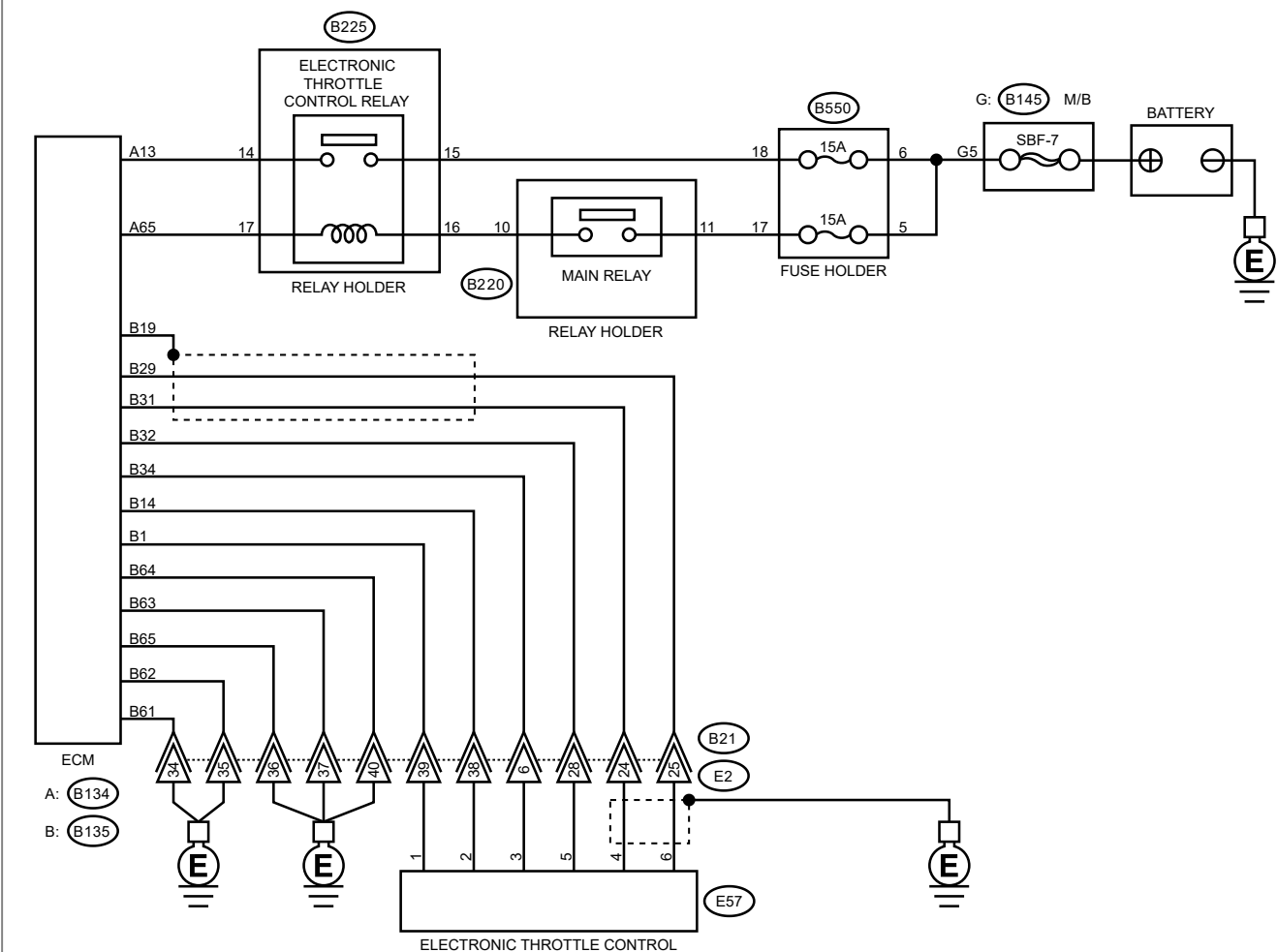
Caution:

- After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode. and Inspection Mode](#)  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





EN-21619

1. CHECK ELECTRONIC THROTTLE CONTROL RELAY.

1. Turn the ignition switch to OFF.
2. Remove the electronic throttle control relay.
3. Measure the resistance between electronic throttle control relay terminals.

Terminals


No. 14 —No. 15:

Is the resistance 1 MΩ or more?

Yes

 [Go to 2.](#)

No

Replace the electronic throttle control relay.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Electronic Throttle Control Relay.](#)

2. CHECK SHORT CIRCUIT OF ELECTRONIC THROTTLE CONTROL RELAY POWER SUPPLY.

1. Turn the ignition switch to ON.
2. Measure the voltage between electronic throttle control relay connector and chassis ground.

Connector & terminal


(B225) No. 14 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power in the harness between ECM connector and electronic throttle control relay connector.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 65 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

Repair the poor contact of ECM connector.

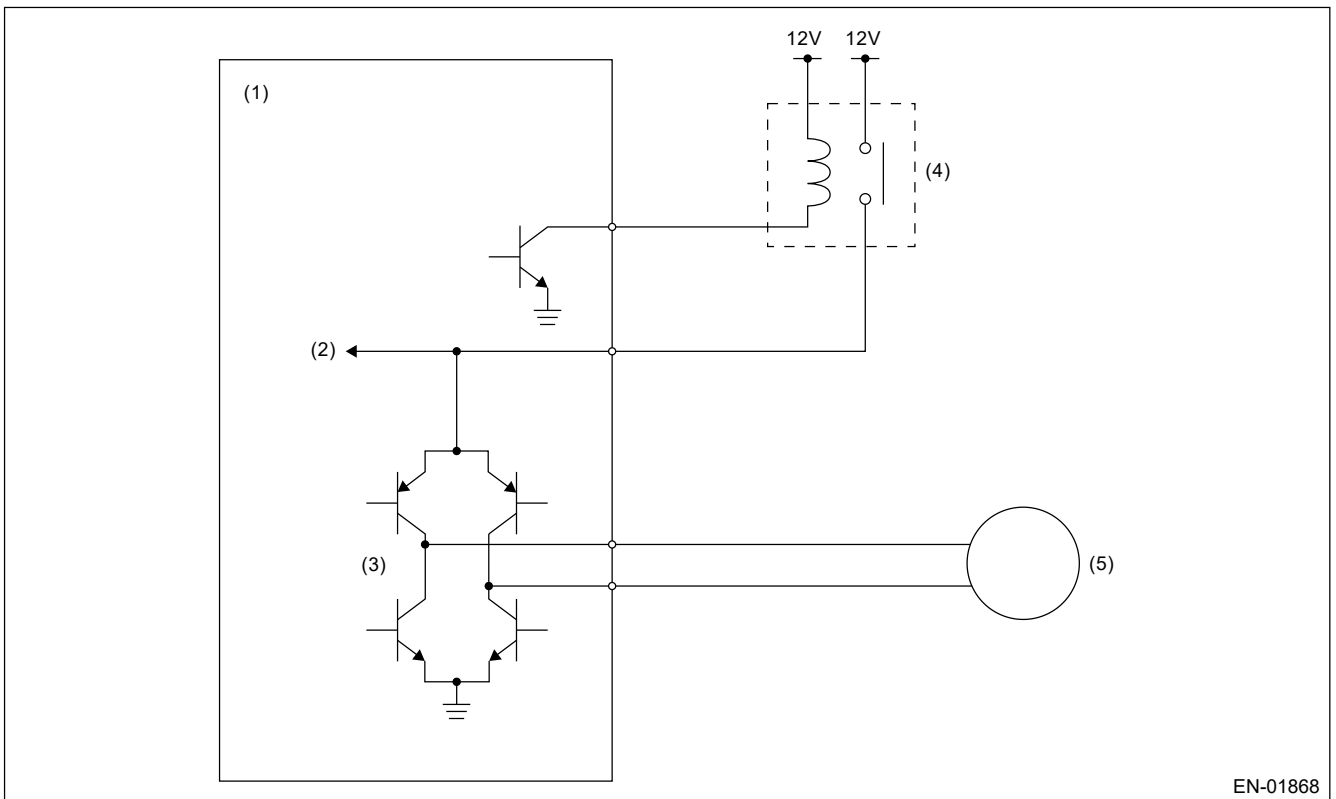
No

Repair the short circuit to ground in harness between ECM connector and electronic throttle control relay connector.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the electronic throttle control power is supplied even when ECM sets the electronic throttle control relay to OFF.

2. COMPONENT DESCRIPTION



EN-01868

- (1) Engine control module (ECM) (3) Drive circuit (5) Motor
 (2) Voltage detection circuit (4) Electronic throttle control relay

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 6V$
Electronic throttle control relay output	OFF

4. GENERAL DRIVING CYCLE

- When ignition switch ON → OFF
- → Ignition switch OFF → ON (only after clearing memory)

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Motor power voltage	$\geq 5V$


Time needed for diagnosis: 600ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2109 THROTTLE/PEDAL POSITION SENSOR "A" MINIMUM STOP PERFORMANCE

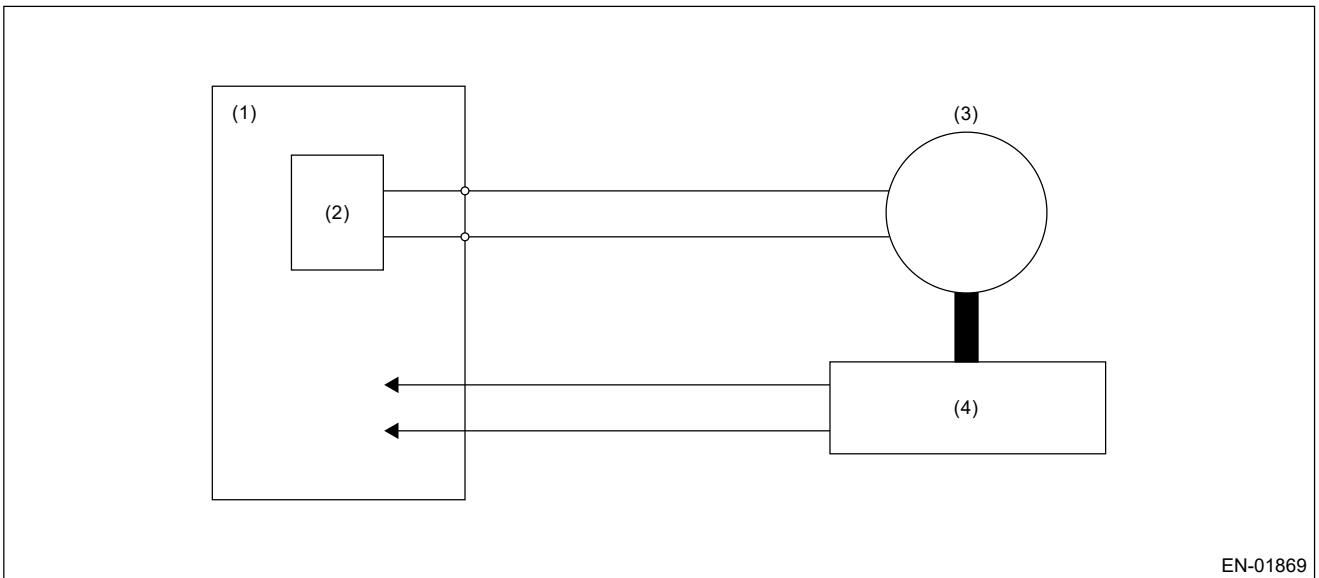
Note:

For the diagnostic procedure, refer to DTC P2101.  Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2101 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE.

1. OUTLINE OF DIAGNOSIS

Judge as NG when full close point learning cannot be conducted or an abnormal value is detected.

2. COMPONENT DESCRIPTION



- (1) Engine control module (ECM)
- (2) Drive circuit
- (3) Motor
- (4) Throttle position sensor

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 6V

4. GENERAL DRIVING CYCLE

Perform the diagnosis at full closed point learning.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value

Throttle sensor opening angle at full close point learning	< -4.02 % or > 4.02 %
or Throttle opening angle when the ignition switch is ON – Throttle minimum stop position	< 1.162°


Time needed for diagnosis: 8ms – 80ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2119 THROTTLE ACTUATOR "A" CONTROL THROTTLE BODY RANGE/PERFORMANCE

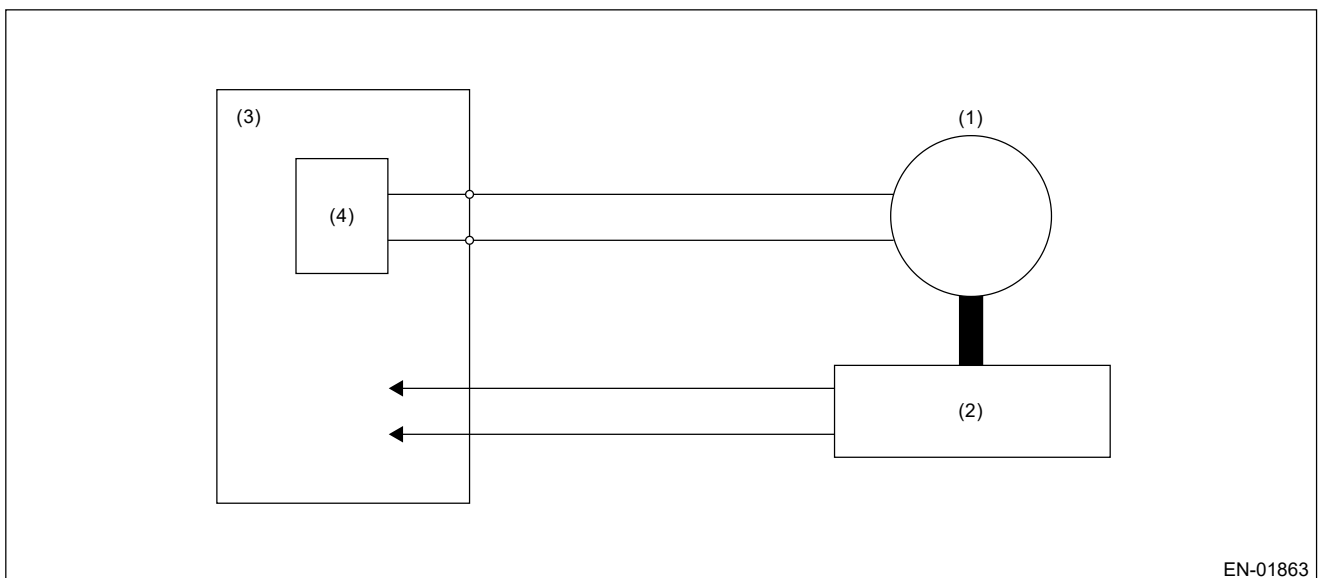
Note:

For the diagnostic procedure, refer to DTC P2101.  Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2101 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the target opening angle and actual opening angle is mismatched or the current to motor is the specified duty or more for specified time continuously.

2. COMPONENT DESCRIPTION



- (1) Motor
- (2) Throttle position sensor
- (3) Engine control module (ECM)
- (4) Drive circuit

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 6.2V
Electronic throttle control relay	ON

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously when the electronic throttle control is operating.

5. DIAGNOSTIC METHOD

Judge as NG if the criteria below are met.

Diagnosis 1

Judgment value

Malfunction Criteria	Threshold Value
Output duty to drive circuit	≥ 95%

Time needed for diagnosis:

- Engine speed ≥ 500 rpm: 2000ms
- Engine speed < 500 rpm: 5000ms

Diagnosis 2

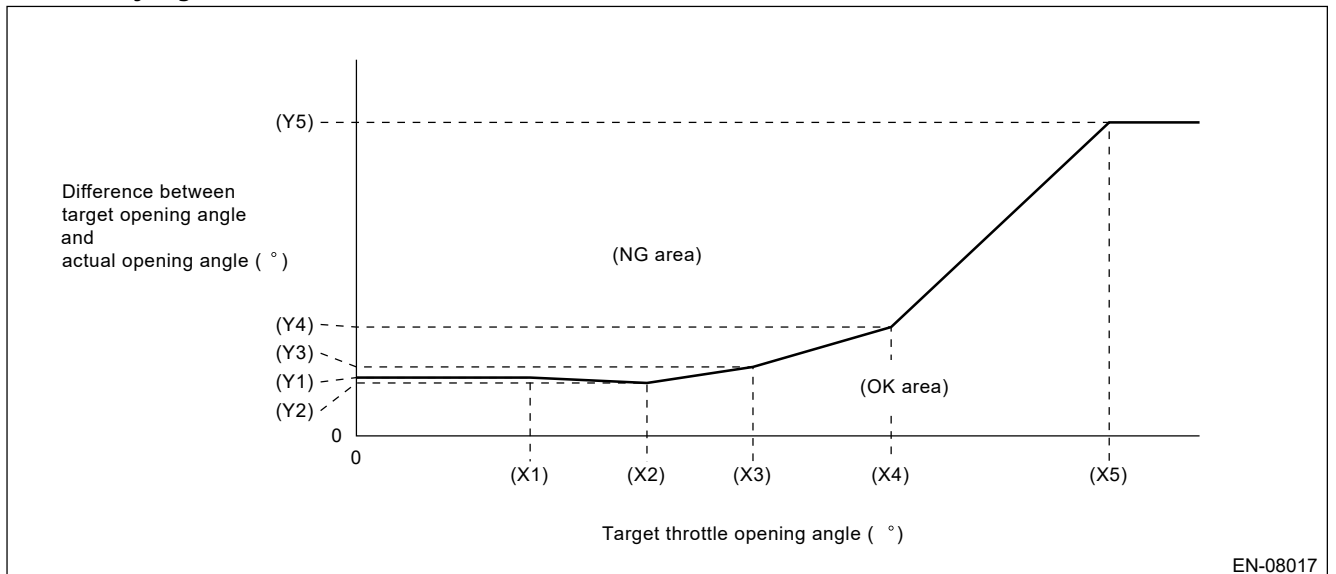
Judgment value

Malfunction Criteria	Threshold Value
Difference between target opening angle and actual opening angle	Within NG range of Details of judgment value

Time needed for diagnosis:

- Engine speed ≥ 500 rpm: Refer to **Details of Judgment time.**
- Engine speed < 500 rpm: 5000 ms

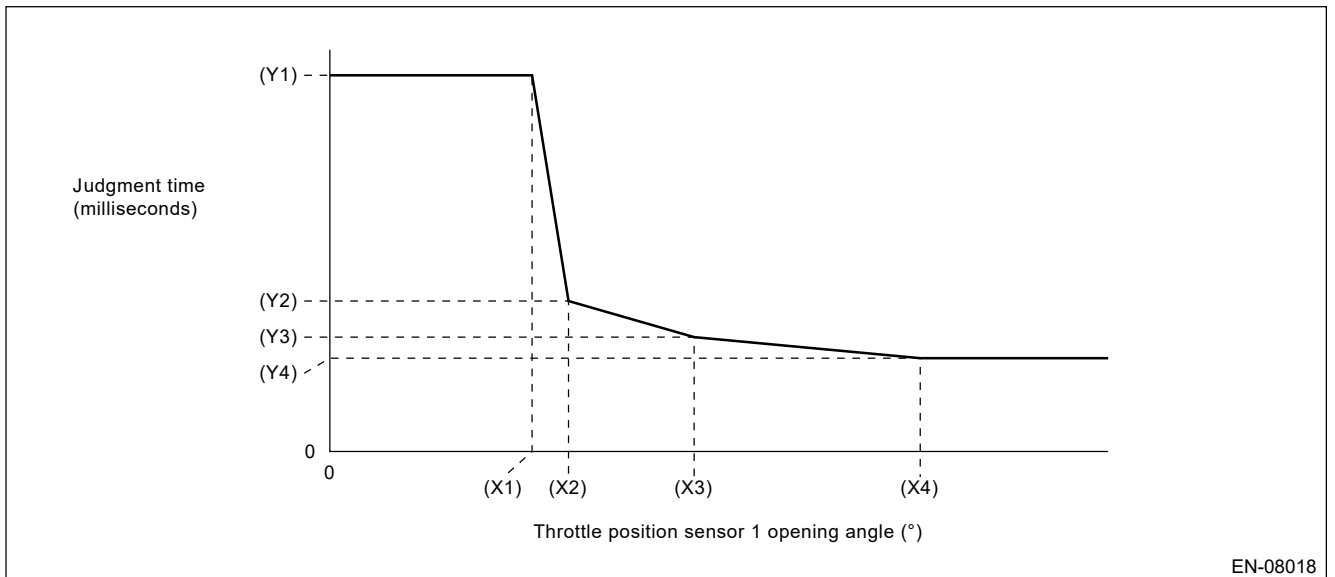
Details of judgment value



EN-08017

(X1) 6.915°	(X2) 11.565°	(X3) 15.785°
(X4) 21.285°	(X5) 29.965°	
(Y1) 4.65°	(Y2) 4.22°	(Y3) 5.5°
(Y4) 8.68°	(Y5) 25°	

Details of Judgment time



(X1) 8.049999237°

(X2) 9.5°

(X3) 14.5°

(X4) 23.5°

(Y1) 1000ms

(Y2) 400ms

(Y3) 304ms

(Y4) 248ms

Note:

Judgment time when actual opening angle < target opening angle is always 1000 milliseconds.

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT LOW



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

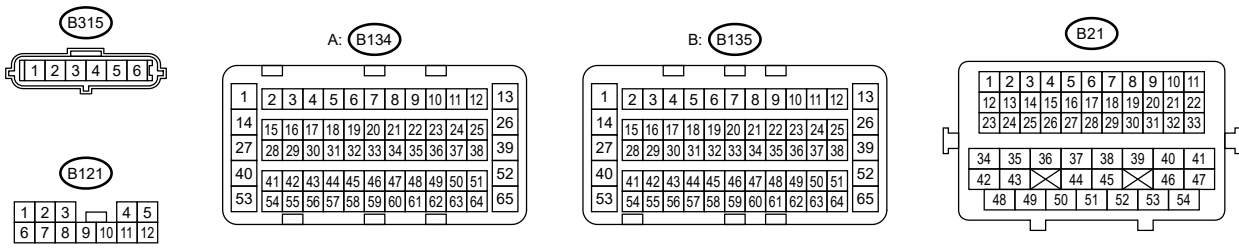
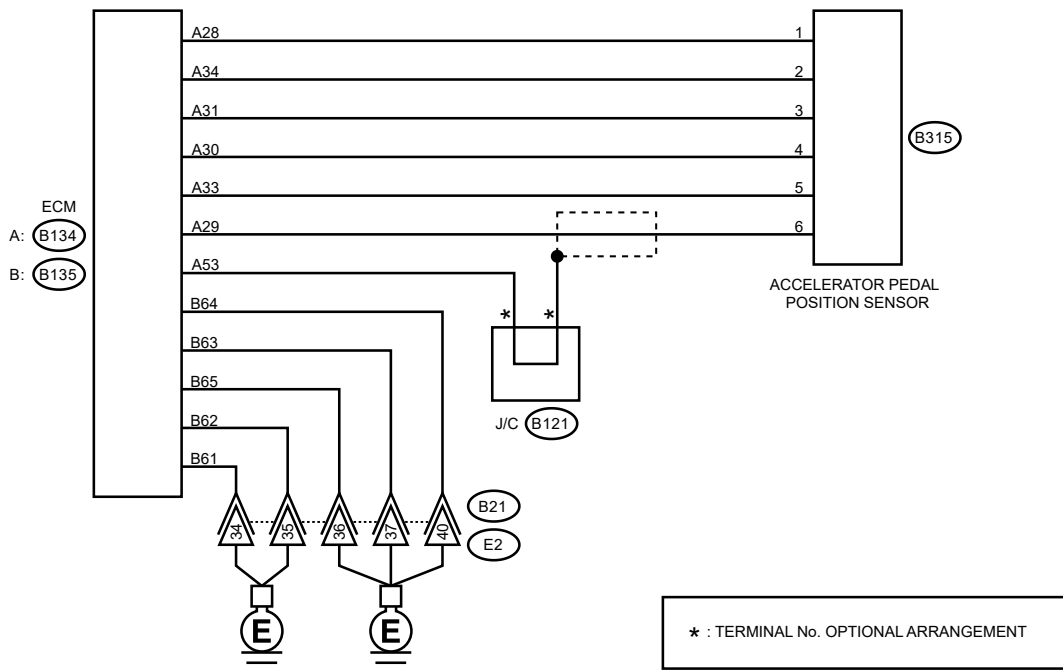
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21590

1. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the accelerator pedal position sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

- (B134) No. 30 — Chassis ground:
- (B134) No. 29 — Chassis ground:
- (B134) No. 29 — (B134) No. 4:

Is the resistance 1 MΩ or more?

Yes

Go to 2.

No

Repair the short circuit to ground in harness between ECM connector and accelerator pedal position sensor connector.

2. CHECK SHORT CIRCUIT INSIDE THE ECM.



1. Connect the connector to ECM.
2. Measure the resistance between accelerator pedal position sensor connector and chassis ground.

Connector & terminal

(B315) No. 6 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

Replace the accelerator pedal. [Ref. to SPEED CONTROL SYSTEMS\(H4DO\)>Accelerator Pedal.](#)

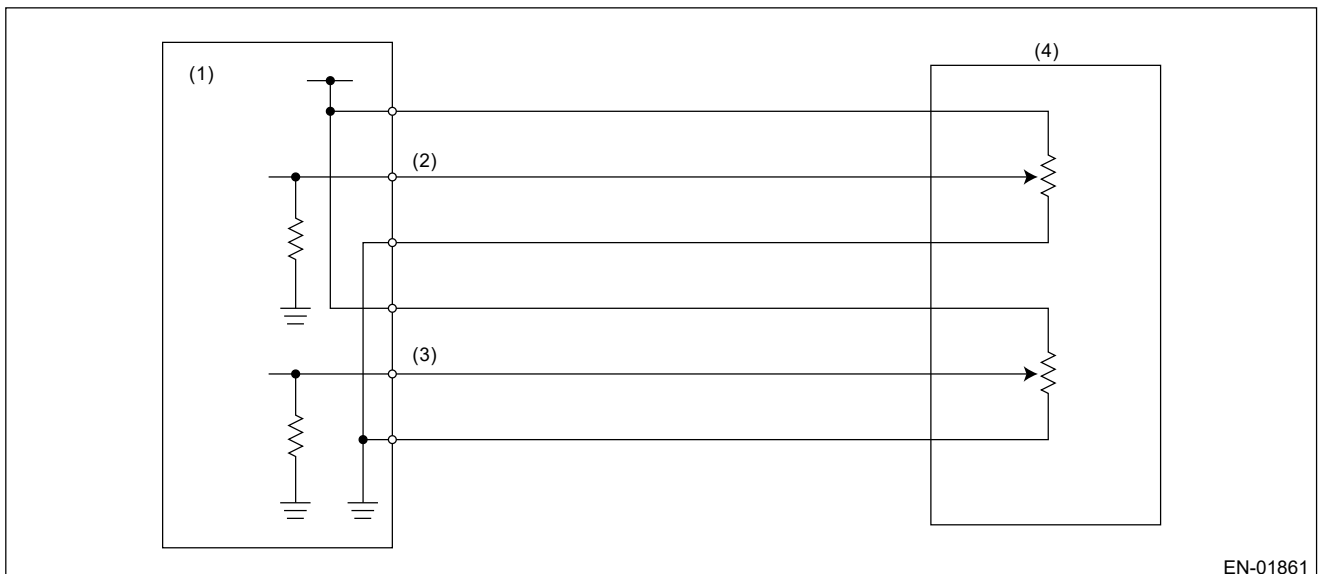
No

Repair the short circuit to ground in harness between ECM connector and accelerator pedal position sensor connector. Replace the ECM if defective. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of accelerator pedal position sensor 1.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-01861

- (1) Engine control module (ECM) (2) Accelerator pedal position
(3) Accelerator pedal position sensor 2 signal (4) Accelerator pedal position sensor

sensor 1 signal

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 6V$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 1 input voltage	$< 0.298V$

Time needed for diagnosis: 100ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

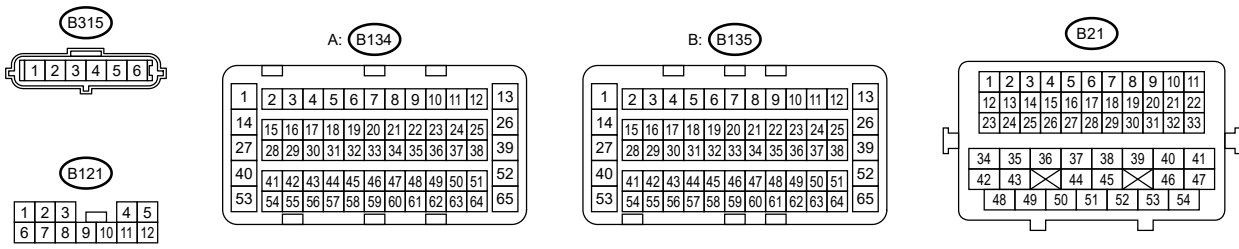
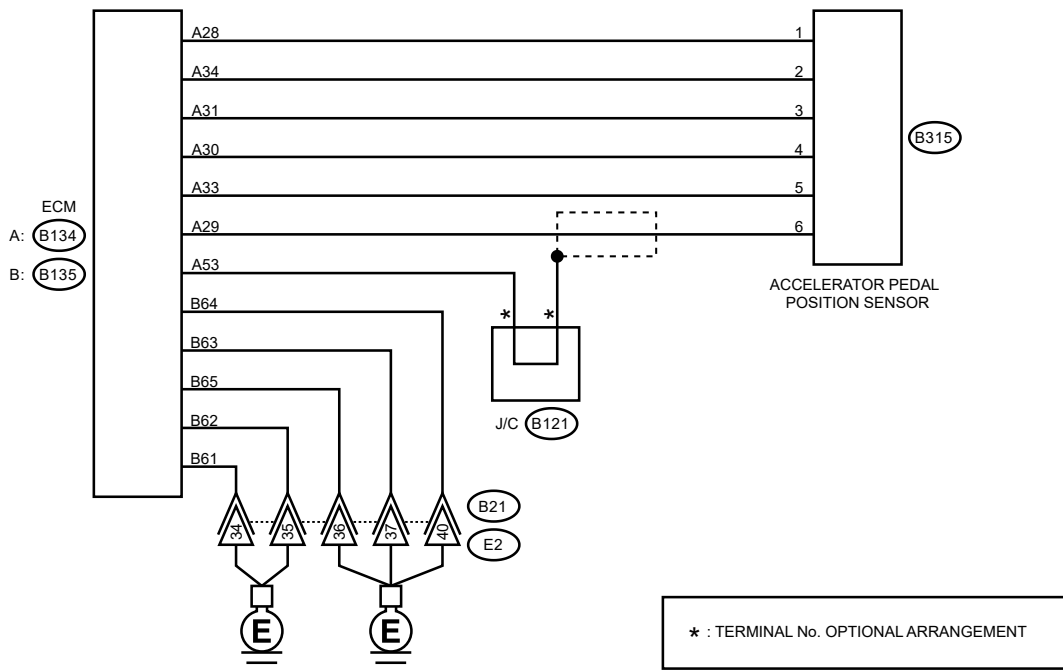
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21590

1. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the accelerator pedal position sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and accelerator pedal position sensor connector.

Connector & terminal

(B134) No. 29 — (B315) No. 6:

(B134) No. 33 — (B315) No. 5:

Is the resistance less than 1 Ω?

Yes

Go to 2.

No

Repair the open circuit of harness between ECM connector and accelerator pedal position sensor connector.

2. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.



1. Connect the connector to ECM.
2. Measure the resistance between accelerator pedal position sensor connector and chassis ground.

Connector & terminal

(B315) No. 5 — Chassis ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and engine ground**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.



1. Turn the ignition switch to ON.
2. Measure the voltage between accelerator pedal position sensor connector and chassis ground.

Connector & terminal

(B315) No. 6 (+) — Chassis ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power supply in harness between ECM connector and accelerator pedal position sensor connector.

No

 [Go to 4.](#)

4. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.

Connector & terminal

(B134) No. 30 — (B134) No. 29:

Is the resistance 1 MΩ or more?

Yes

Repair the poor contact of accelerator pedal position sensor connector. Replace the accelerator pedal if defective.  [Ref. to SPEED CONTROL SYSTEMS\(H4DO\)>Accelerator Pedal.](#)

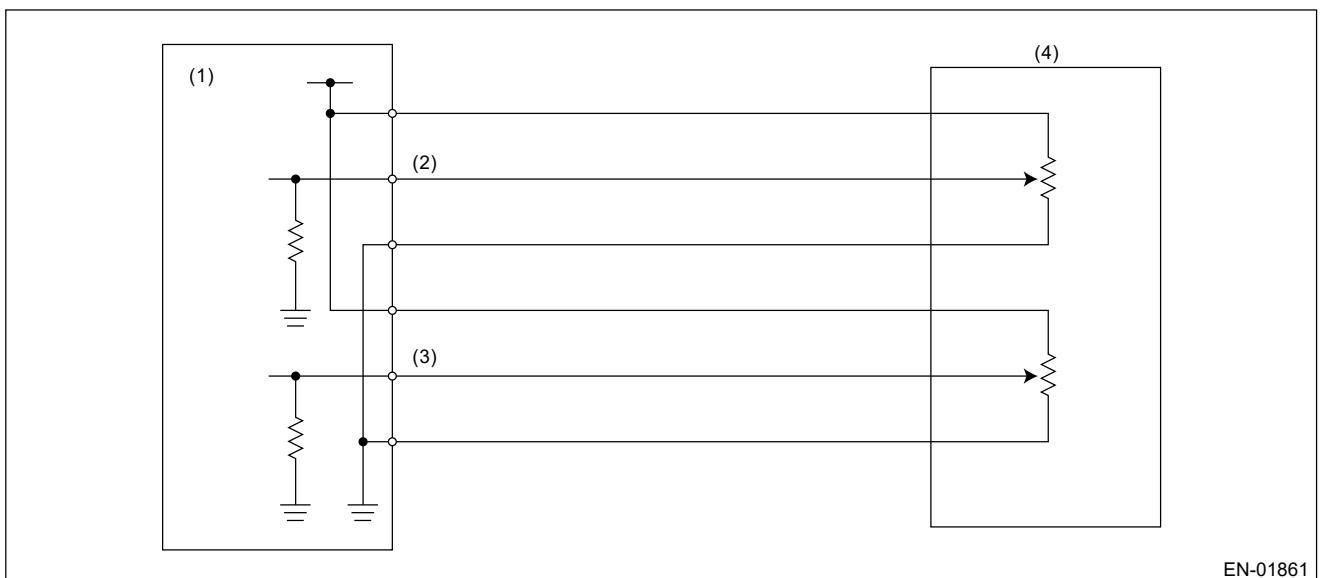
No

Repair the short circuit to power supply in harness between ECM connector and accelerator pedal position sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of accelerator pedal position sensor 1.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Engine control module (ECM)

(3) Accelerator pedal position sensor 2 signal

(4) Accelerator pedal position sensor

(2) Accelerator pedal position sensor 1 signal

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 6V$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 1 input voltage	$\geq 4.757V$

Time needed for diagnosis: 32ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2127 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

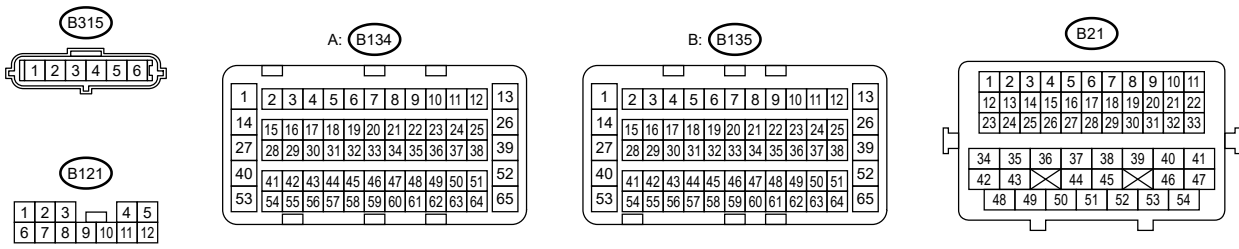
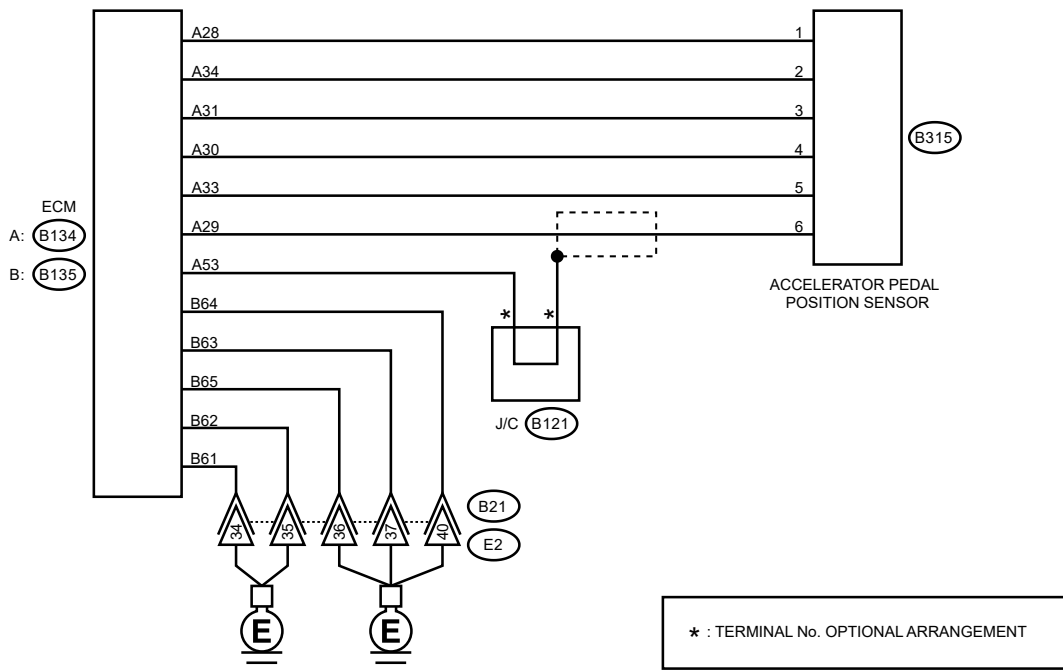
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21590

1. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the accelerator pedal position sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

- (B134) No. 28 — Chassis ground:
- (B134) No. 31 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

[Go to 2.](#)

No

Repair the short circuit to ground in harness between ECM connector and accelerator pedal position sensor connector.

2. CHECK SHORT CIRCUIT INSIDE THE ECM.



1. Connect the connector to ECM.
2. Measure the resistance between accelerator pedal position sensor connector and chassis ground.

Connector & terminal

(B315) No. 3 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

Replace the accelerator pedal. [Ref. to SPEED CONTROL SYSTEMS\(H4DO\)>Accelerator Pedal.](#)

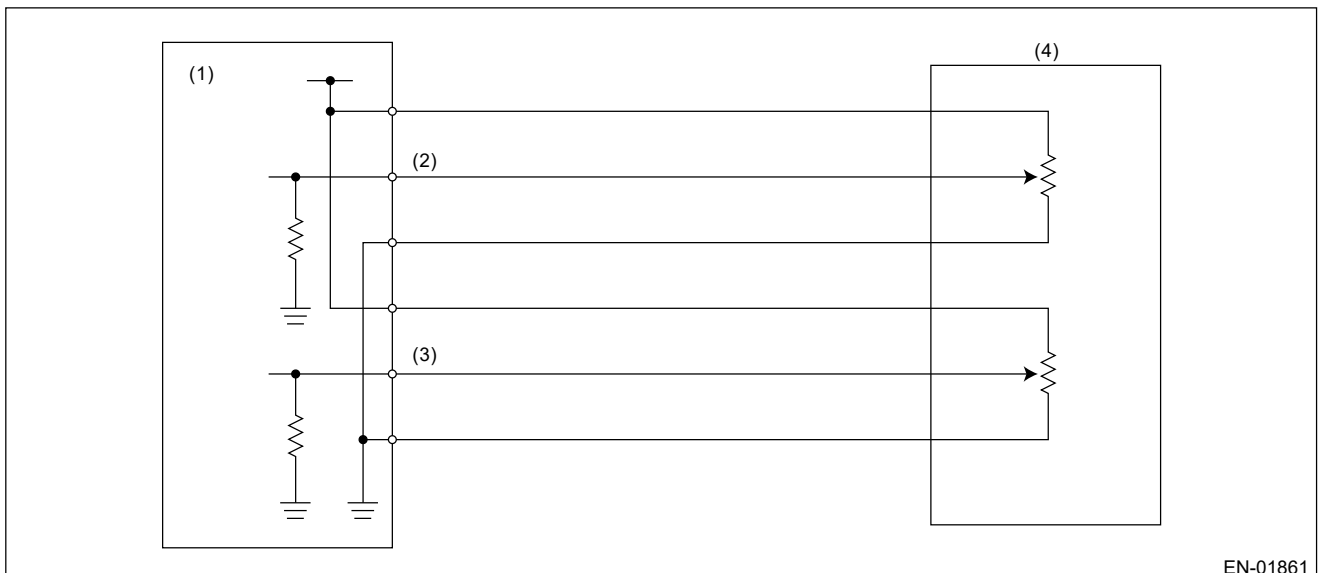
No

Repair the short circuit to ground in harness between ECM connector and accelerator pedal position sensor connector. Replace the ECM if defective. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of accelerator pedal position sensor 2.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-01861

(1) Engine control module (ECM)

(3) Accelerator pedal position sensor 2 signal

(4) Accelerator pedal position sensor

(2) Accelerator pedal position

sensor 1 signal

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 6V$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 2 input voltage	$< 0.298V$

Time needed for diagnosis: 100ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2128 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

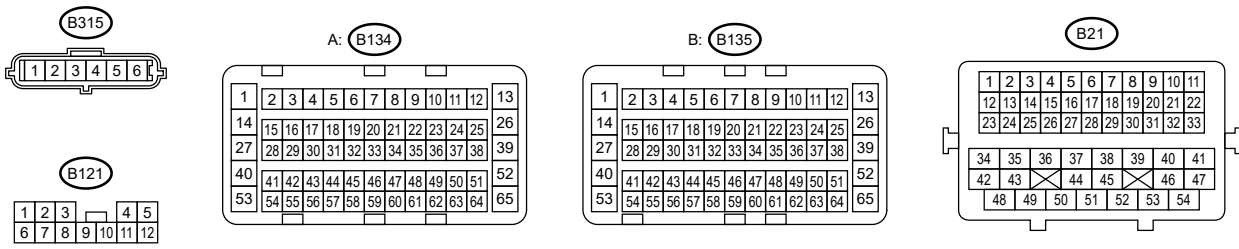
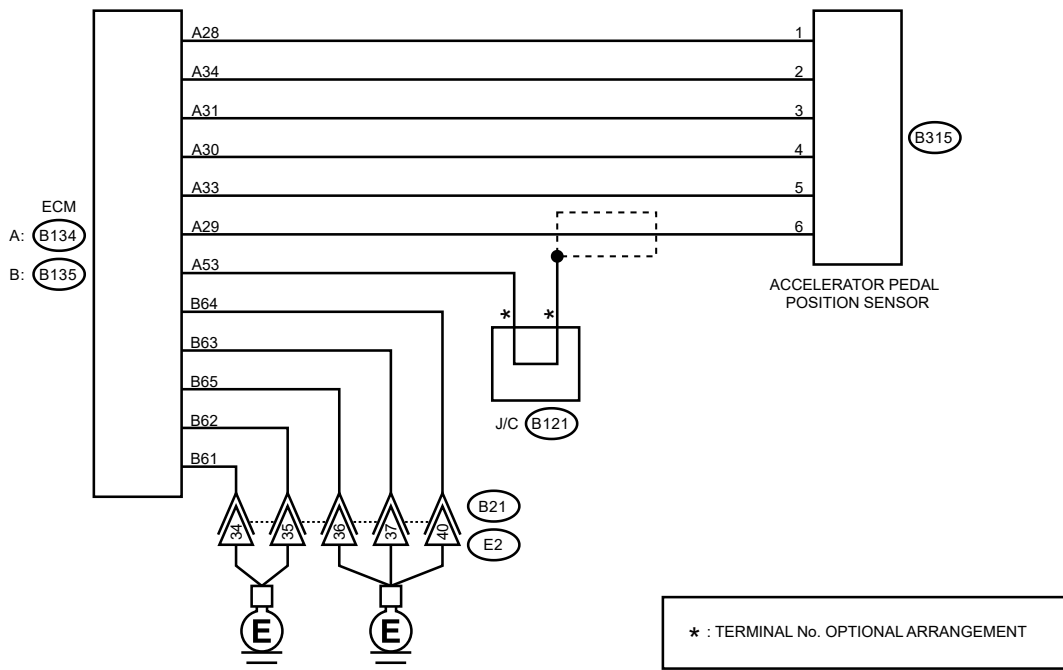
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21590

1. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the accelerator pedal position sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and accelerator pedal position sensor connector.

Connector & terminal

(B134) No. 31 — (B315) No. 3:

(B134) No. 34 — (B315) No. 2:

Is the resistance less than 1 Ω?

Yes

Go to 2.

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and accelerator pedal position sensor connector**
- **Poor contact of joint connector**

2. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.


1. Connect the connector to ECM.
2. Measure the resistance between accelerator pedal position sensor connector and chassis ground.

Connector & terminal

(B315) No. 2 — Chassis ground:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and engine ground**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.

1. Turn the ignition switch to ON.
2. Measure the voltage between accelerator pedal position sensor connector and chassis ground.

Connector & terminal

(B315) No. 3 (+) — Chassis ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power supply in harness between ECM connector and accelerator pedal position sensor connector.

No

 [Go to 4.](#)

4. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.

Connector & terminal

(B135) No. 22 — (B134) No. 31:

Is the resistance 1 MΩ or more?

Yes

Repair the poor contact of accelerator pedal position sensor connector. Replace the accelerator pedal if defective.  [Ref. to SPEED CONTROL SYSTEMS\(H4DO\)>Accelerator Pedal.](#)

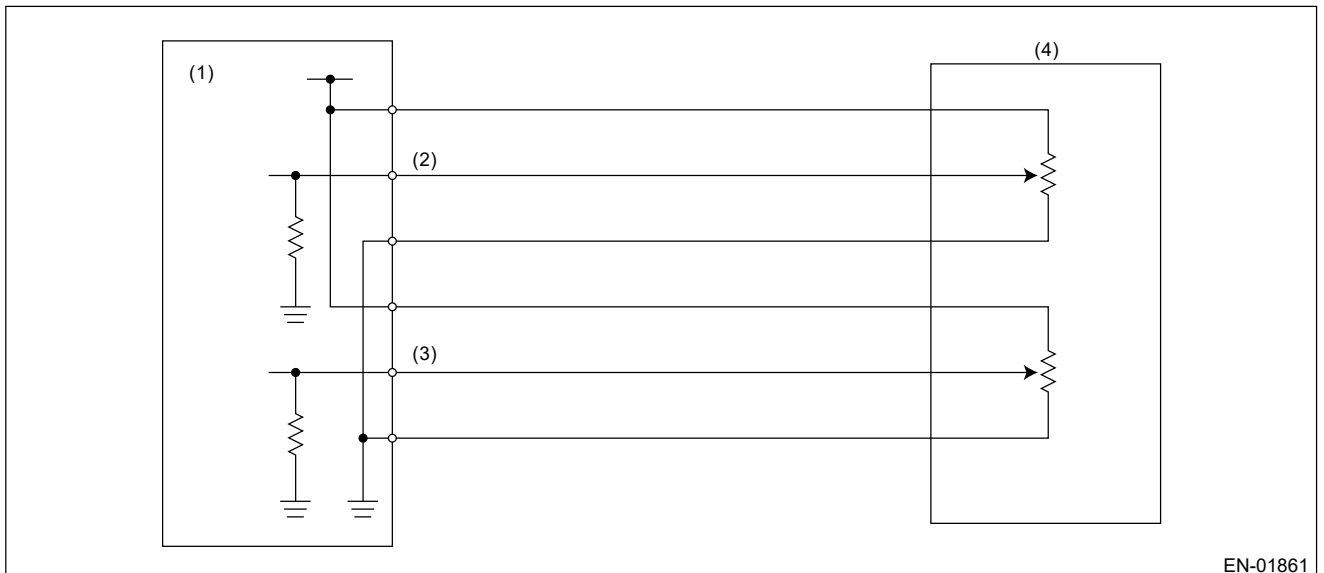
No

Repair the short circuit to power supply in harness between ECM connector and accelerator pedal position sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of accelerator pedal position sensor 2.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-01861

- (1) Engine control module (ECM) (3) Accelerator pedal position sensor 2 signal (4) Accelerator pedal position sensor
- (2) Accelerator pedal position sensor 1 signal

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 6V$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 2 input voltage	$\geq 4.757V$

Time needed for diagnosis: 100ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2135 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE CORRELATION



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

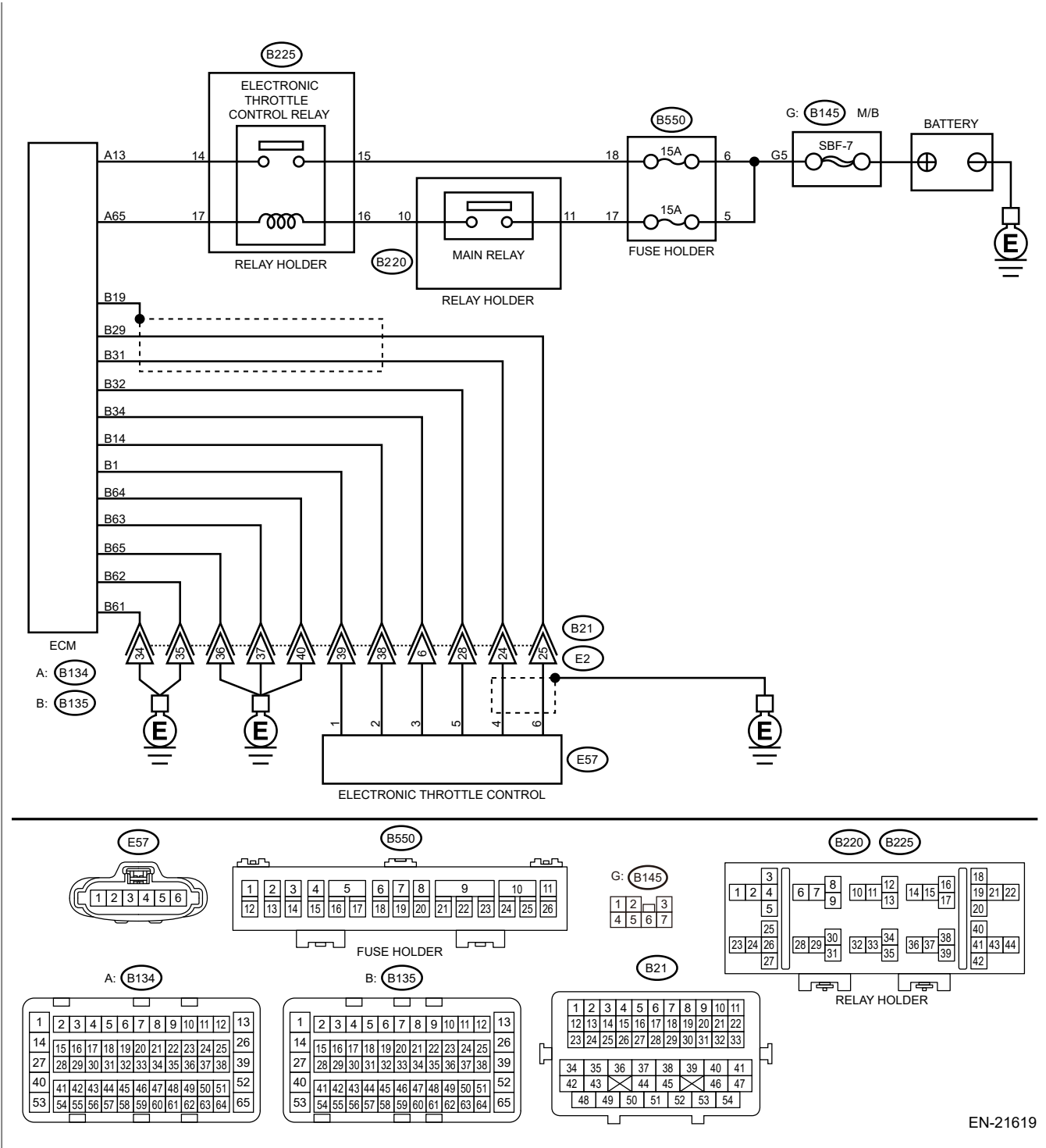
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21619

1. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from electronic throttle control.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM connector and chassis ground.




Connector & terminal

- (B135) No. 32 — Chassis ground:
- (B135) No. 29 — Chassis ground:
- (B135) No. 29 — (B135) No. 19:
- (B135) No. 31 — Chassis ground:
- (B135) No. 31 — (B135) No. 19:

Is the resistance 1 M Ω or more?

Yes

 [Go to 2.](#)

No

Repair the ground short circuit of harness between ECM connector and electronic throttle control connector.

2. CHECK SHORT CIRCUIT INSIDE THE ECM.

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal


- (E57) No. 6 — Engine ground:
- (E57) No. 4 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 3.](#)

No

Repair the ground short circuit of harness between ECM connector and electronic throttle control connector. Replace the ECM if defective.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and electronic throttle control connector.

Connector & terminal

- (B135) No. 29 — (E57) No. 6:
- (B135) No. 31 — (E57) No. 4:
- (B135) No. 34 — (E57) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and electronic throttle control connector**
- **Poor contact of coupling connector**

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 3 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 5.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and engine ground**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

5. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to ON.
2. Measure the voltage between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 6 (+) — Engine ground (-):


(E57) No. 4 (+) — Engine ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in the harness between ECM connector and electronic throttle control connector.

No

 [Go to 6.](#)

6. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.

Connector & terminal

(B135) No. 32 — (B135) No. 29:

(B135) No. 32 — (B135) No. 31:

Is the resistance 1 MΩ or more?

Yes

Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Throttle Body.](#)

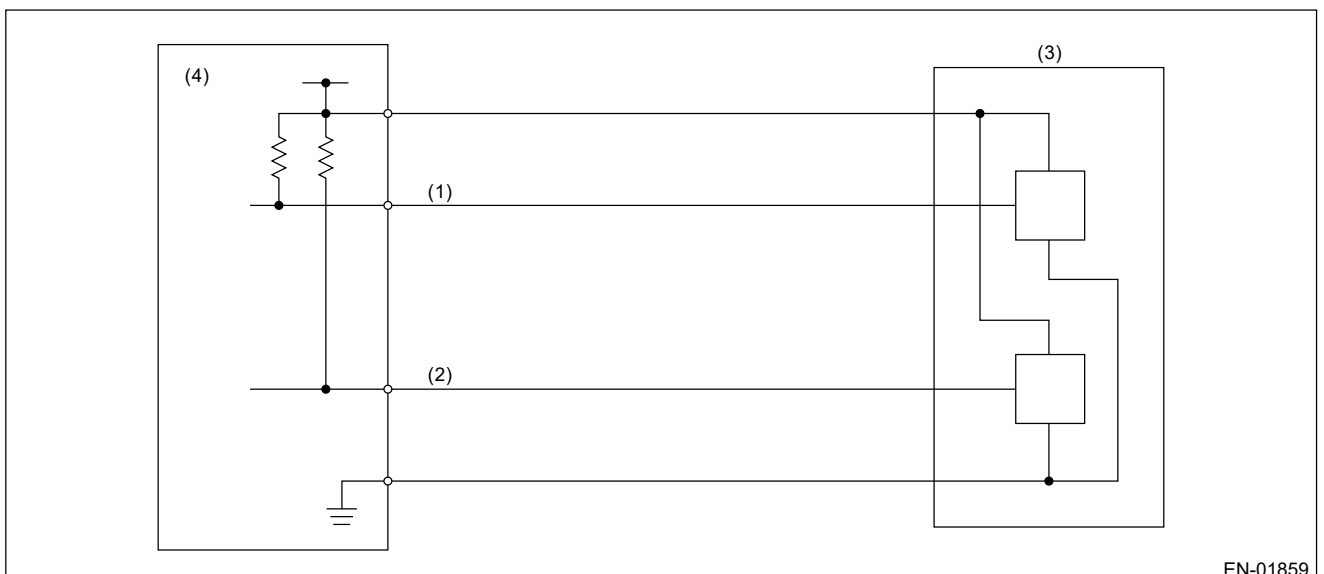
No

Repair the short circuit to power in the harness between ECM connector and electronic throttle control connector.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the signal level of throttle position sensor 1 is different from the throttle position sensor 2.

2. COMPONENT DESCRIPTION



(1) Throttle position sensor 1 signal

(3) Throttle position sensor

(4) Engine control module (ECM)

(2) Throttle position sensor 2 signal

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 6V

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

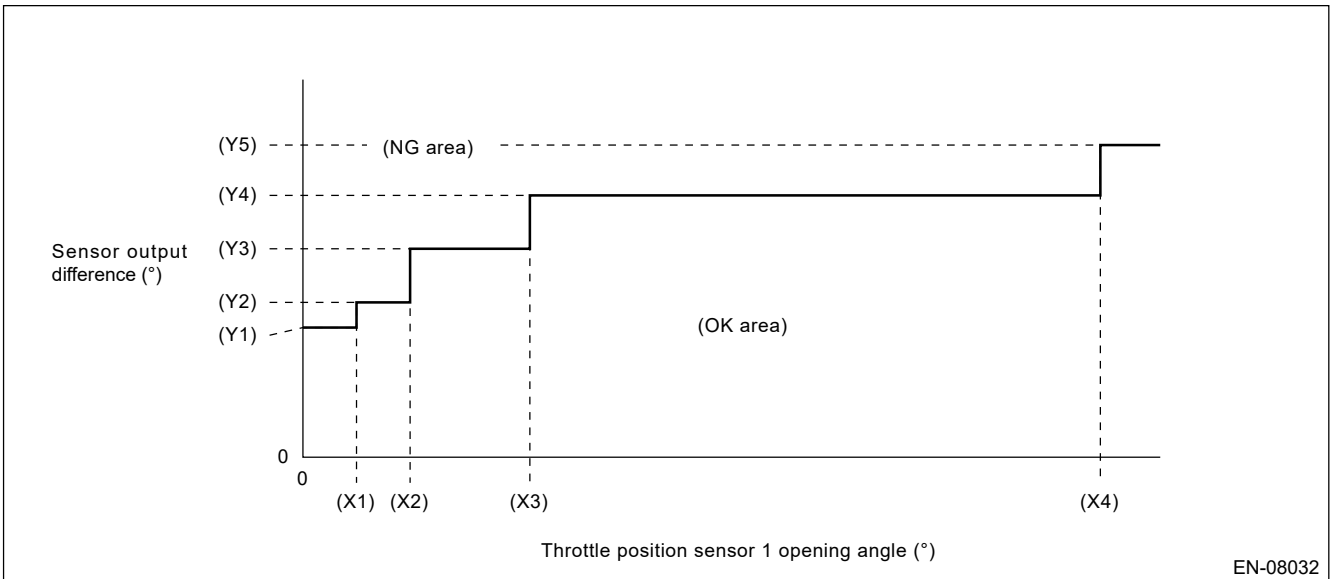
5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal difference between two sensors	Within NG range of Details of judgment value

Details of judgment value



EN-08032

- | | | |
|--------------|--------------|-------------|
| (X1) 2.125° | (X2) 4.25° | (X3) 9° |
| (X4) 31.625° | | |
| (Y1) 4.736° | (Y2) 5.736° | (Y3) 7.861° |
| (Y4) 9.986° | (Y5) 11.986° | |

Time needed for diagnosis: 212ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2138 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE CORRELATION



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

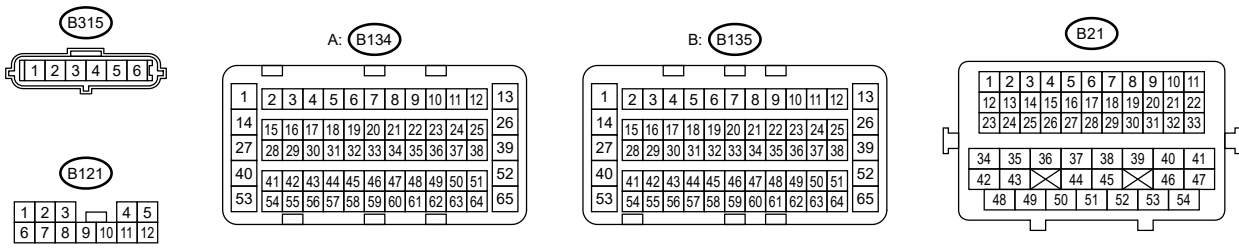
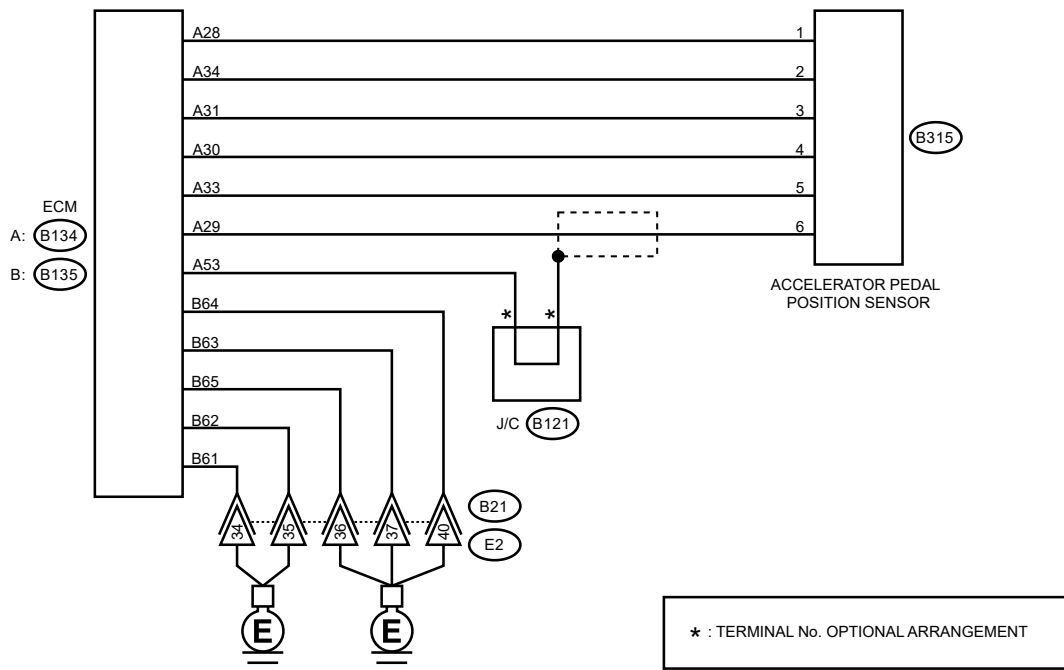
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21590

1. CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.



1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

Main accelerator pedal position sensor signal

(B134) No. 29 (+) — Chassis ground (-):

Sub accelerator pedal position sensor signal


(B134) No. 31 (+) — Chassis ground (-):

Is the difference in measured values for the main accelerator pedal position sensor signal and the sub accelerator pedal position sensor signal 0 V?

Yes

[Go to 3.](#)

No

 [Go to 2.](#)

2. CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.

1. Measure the voltage between accelerator pedal position sensor connector and chassis ground.


Connector & terminal

(B315) No. 6 (+) — Chassis ground (-):

(B315) No. 3 (+) — Chassis ground (-):

Is the difference in measured values for the main accelerator pedal position sensor signal and the sub accelerator pedal position sensor signal 0 V?

Yes

Replace the accelerator pedal.  [Ref. to SPEED CONTROL SYSTEMS\(H4DO\)>Accelerator Pedal.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and accelerator pedal position sensor connector**
- **Short circuit to ground in harness between ECM connector and accelerator pedal position sensor connector**

3. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.

Measure the resistance of harness between accelerator pedal position sensor connector and chassis ground.

Connector & terminal

(B315) No. 5 — Chassis ground:

(B315) No. 2 — Chassis ground:

Is the resistance less than 5 Ω ?

Yes

Repair the poor contact of ECM connector.

No

repair the harness and connector.

Note:

In this case, repair the following item:

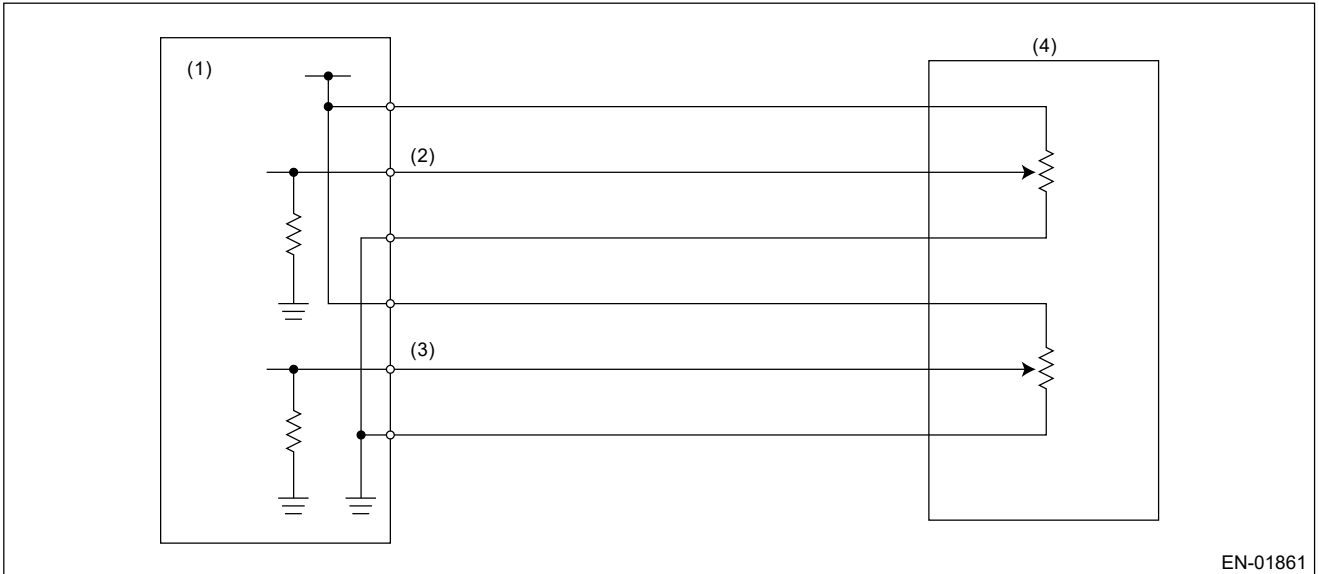
- **Open circuit of harness between ECM connector and accelerator pedal position sensor connector**
- **Open circuit of harness between ECM connector and engine ground**

- Poor contact of ECM connector
- Poor contact of joint connector

1. OUTLINE OF DIAGNOSIS

Judge as NG when the signal level of accelerator pedal position sensor 1 is different from the accelerator pedal position sensor 2.

2. COMPONENT DESCRIPTION



EN-01861

- (1) Engine control module (ECM) (3) Accelerator pedal position sensor 2 signal (4) Accelerator pedal position sensor
- (2) Accelerator pedal position sensor 1 signal

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 6V$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

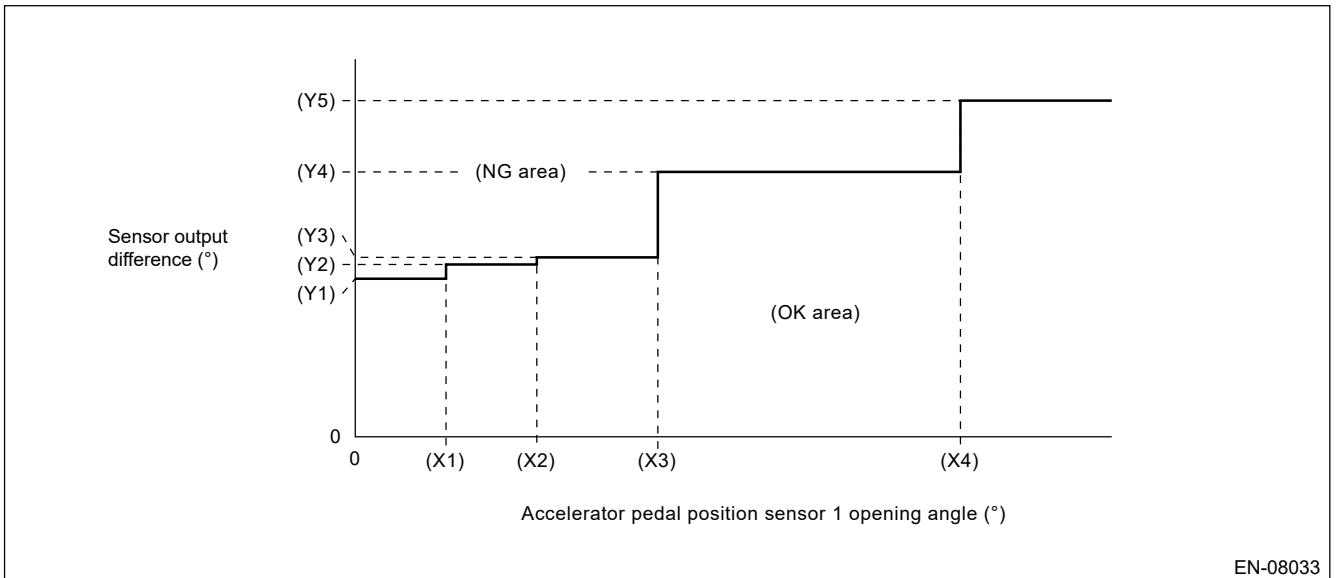
5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal difference between two sensors	Within NG range of Details of judgment value

Details of judgment value



(X1) 0.6°

(X2) 1.2°

(X3) 2°

(X4) 4°

(Y1) 1.465°

(Y2) 1.597°

(Y3) 1.663°

(Y4) 2.455°

(Y5) 3.116°

Time needed for diagnosis: 116ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2195 A/F /O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 1

DTC detecting condition:

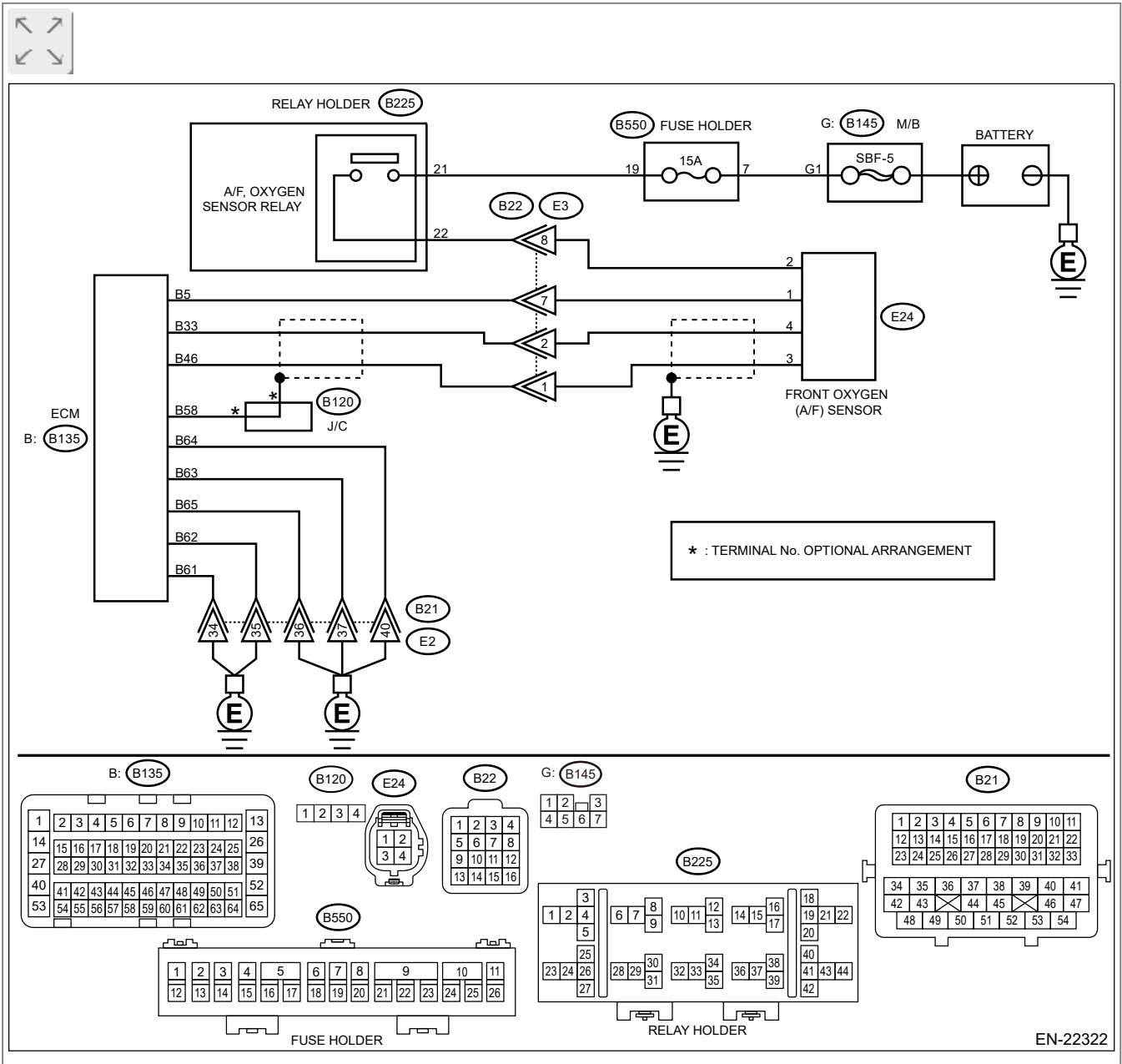
Detected when two consecutive driving cycles with fault occur.

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.



Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

Connector & terminal

(B135) No. 46 — (E24) No. 3:

(B135) No. 33 — (E24) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and front oxygen (A/F) sensor connector**
- **Poor contact of coupling connector**

3. CHECK FOR POOR CONTACT.




Check for poor contact of the front oxygen (A/F) sensor connector.

Is there poor contact of front oxygen (A/F) sensor connector?

Yes

Repair the poor contact of front oxygen (A/F) sensor connector.

No

Replace the front oxygen (A/F) sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Front Oxygen \(A/F\) Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect that λ value remains low.

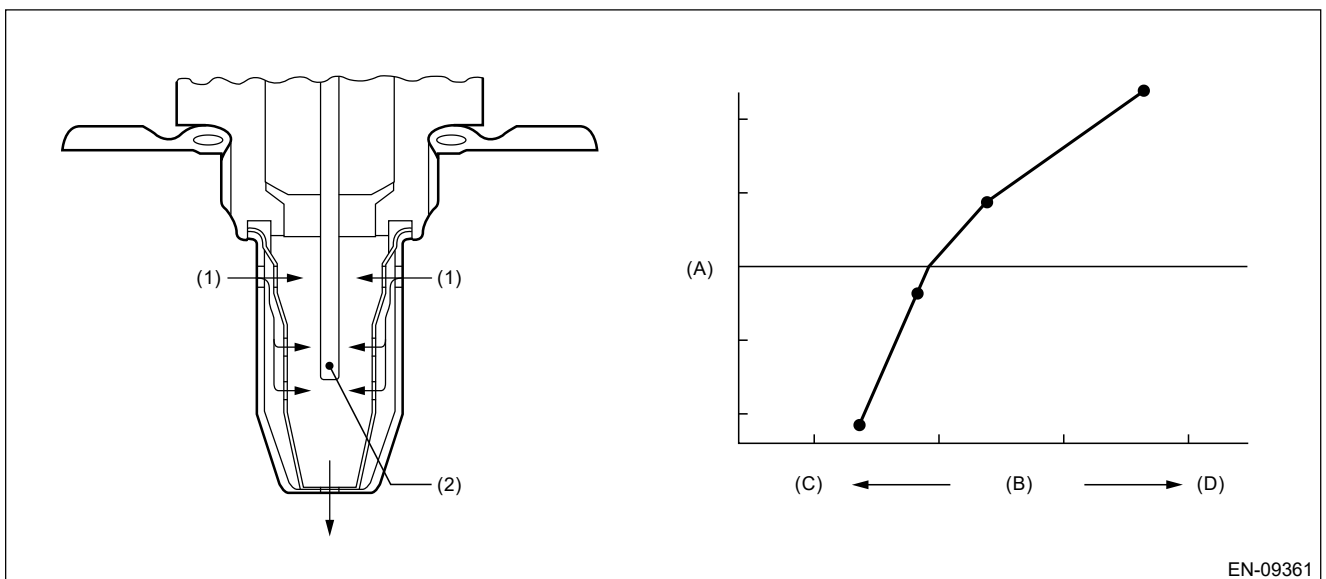
Judge as NG when lambda value is abnormal in accordance with λ value of front oxygen (A/F) sensor and running conditions such as vehicle speed, amount of intake air, engine coolant temperature, sub feedback control, etc.

λ value = Actual air fuel ratio/Theoretical air fuel ratio

$\lambda > 1$: Lean

$\lambda < 1$: Rich

2. COMPONENT DESCRIPTION



(A) Electromotive force

(B) Air fuel ratio

(C) Rich

(D) Lean

(1) Exhaust gas

(2) ZrO_2

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Barometric pressure	> 75.1 kPa (563mmHg, 22.2inHg)
Sub feedback	In operation
Amount of intake air	≥ 6 g/s (0.21oz/s)
Rear oxygen sensor sub feedback	Execution
Rear oxygen sensor output voltage – Feedback target voltage	-0.2 V -0.1 V
or	
Rear oxygen sensor sub feedback compensation	Minimum value

coefficient or Rear oxygen sensor sub feedback compensation coefficient	Maximum value
--	---------------

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
λ value	≤ 0.85

Time needed for diagnosis: 10000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2196 A/F /O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 1

DTC detecting condition:

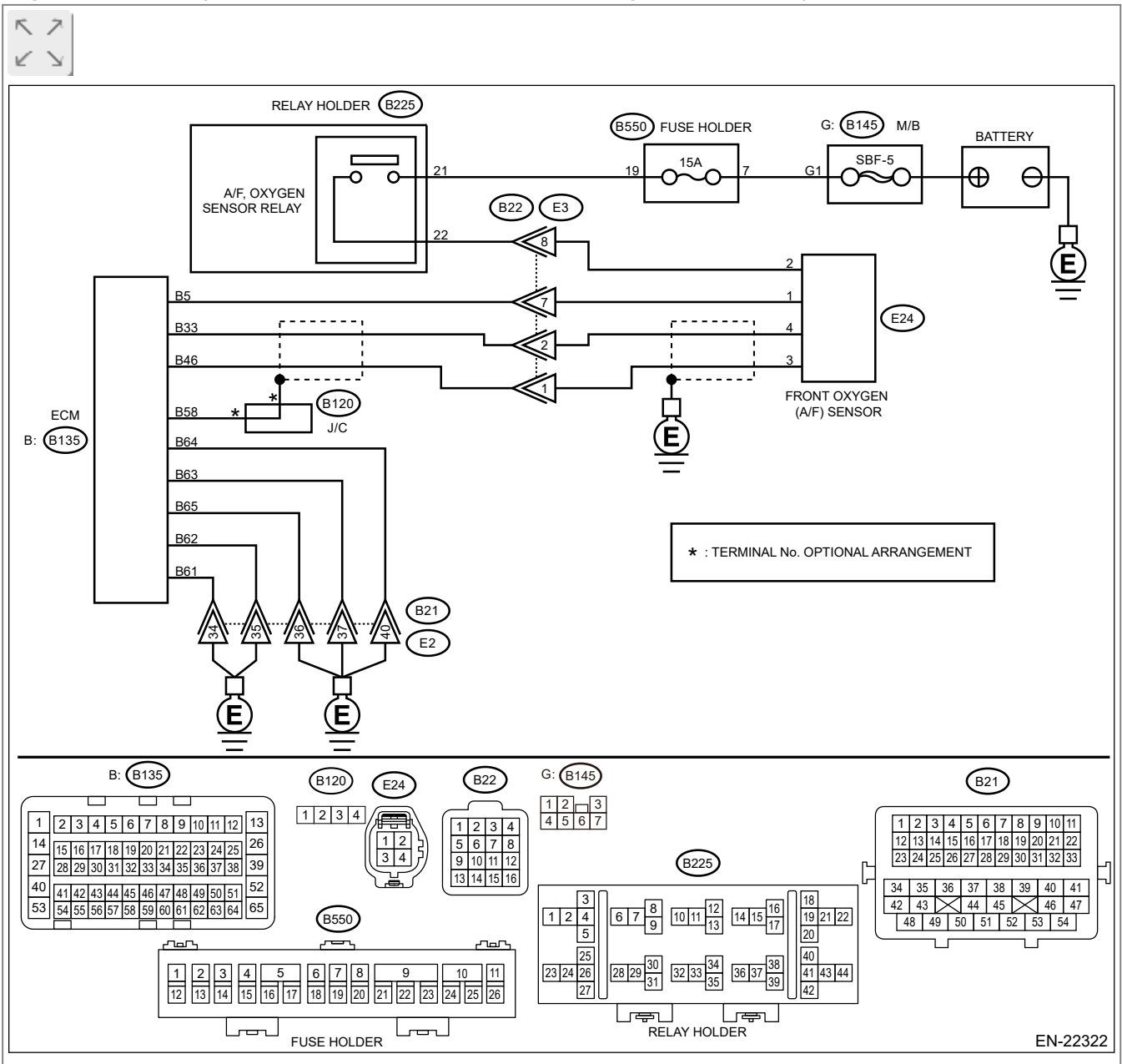
Detected when two consecutive driving cycles with fault occur.

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.




Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B135) No. 46 — Chassis ground:

(B135) No. 33 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 3.](#)

No

Repair the short circuit to ground in harness between ECM connector and front oxygen (A/F) sensor connector.

3. CHECK OUTPUT SIGNAL FOR ECM.



1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B135) No. 46 (+) — Chassis ground (-):

Is the voltage 4.5 V or more?

Yes

 [Go to 5.](#)

No

 [Go to 4.](#)

4. CHECK OUTPUT SIGNAL FOR ECM.


Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B135) No. 33 (+) — Chassis ground (—):

Is the voltage 4.95 V or more?

Yes

 [Go to 5.](#)

No

Replace the front oxygen (A/F) sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Front Oxygen \(A/F\) Sensor.](#)

5. CHECK OUTPUT SIGNAL FOR ECM.

Measure the voltage between ECM connector and chassis ground.


Connector & terminal

(B135) No. 46 (+) — Chassis ground (—):

(B135) No. 33 (+) — Chassis ground (—):

Is the voltage 8 V or more?

Yes

Repair the short circuit to power in the harness between ECM connector and front oxygen (A/F) sensor connector. After repair, replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)

No

Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Detect that λ value remains high.

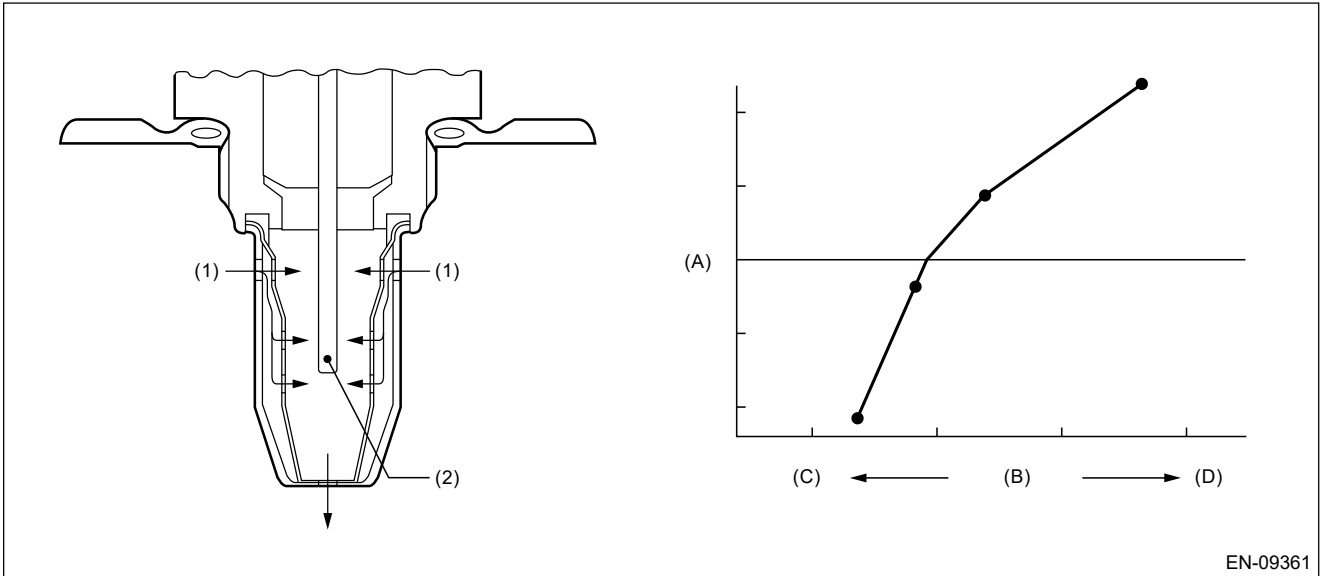
Judge as NG when lambda value is abnormal in accordance with λ value of front oxygen (A/F) sensor and running conditions such as vehicle speed, amount of intake air, engine coolant temperature, sub feedback control, etc.

λ value = Actual air fuel ratio/Theoretical air fuel ratio

$\lambda > 1$: Lean

$\lambda < 1$: Rich

2. COMPONENT DESCRIPTION



- (A) Electromotive force
- (B) Air fuel ratio
- (C) Rich
- (D) Lean
- (1) Exhaust gas
- (2) ZrO₂

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Barometric pressure	> 75.1kPa (563mmHg, 22.2inHg)
Sub feedback	In operation
Amount of intake air	≥ 6g/s (0.21oz/s)
Rear oxygen sensor sub feedback	Execution
Rear oxygen sensor output voltage – Feedback target voltage	-0.2V – 0.1V
or	
Rear oxygen sensor sub feedback compensation coefficient	Minimum value
or	
Rear oxygen sensor sub feedback compensation coefficient	Maximum value

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value

λ value	≥ 1.15
-----------------	-------------

Time needed for diagnosis: 10000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P219C CYLINDER 1 AIR-FUEL RATIO IMBALANCE



DTC detecting condition:

- Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Engine stalls.
- Improper idling

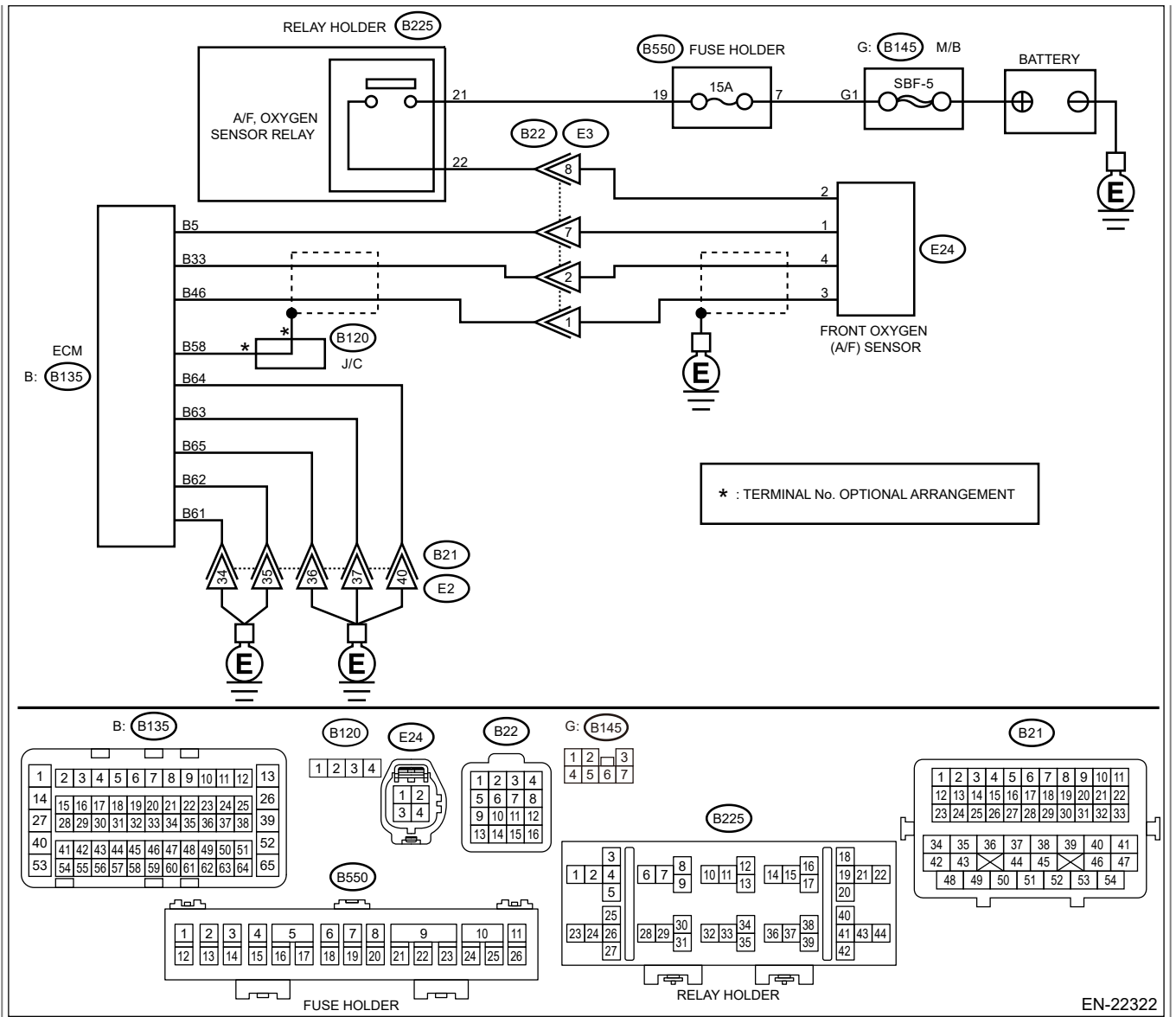
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

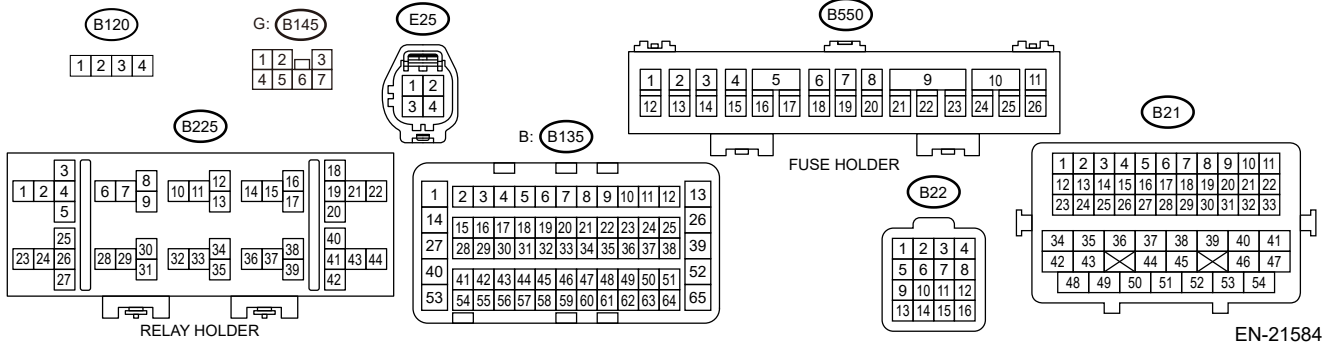
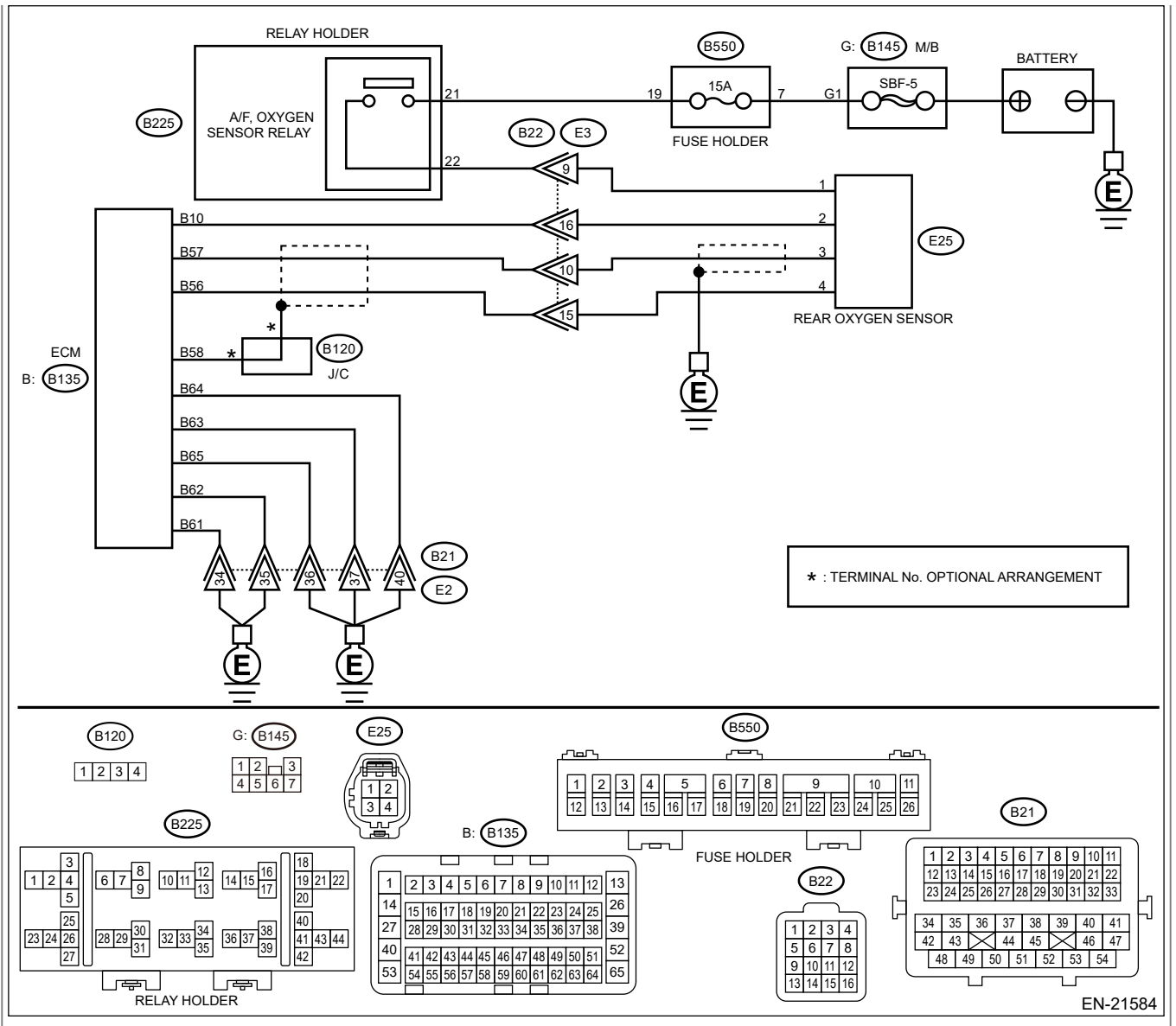
- Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.

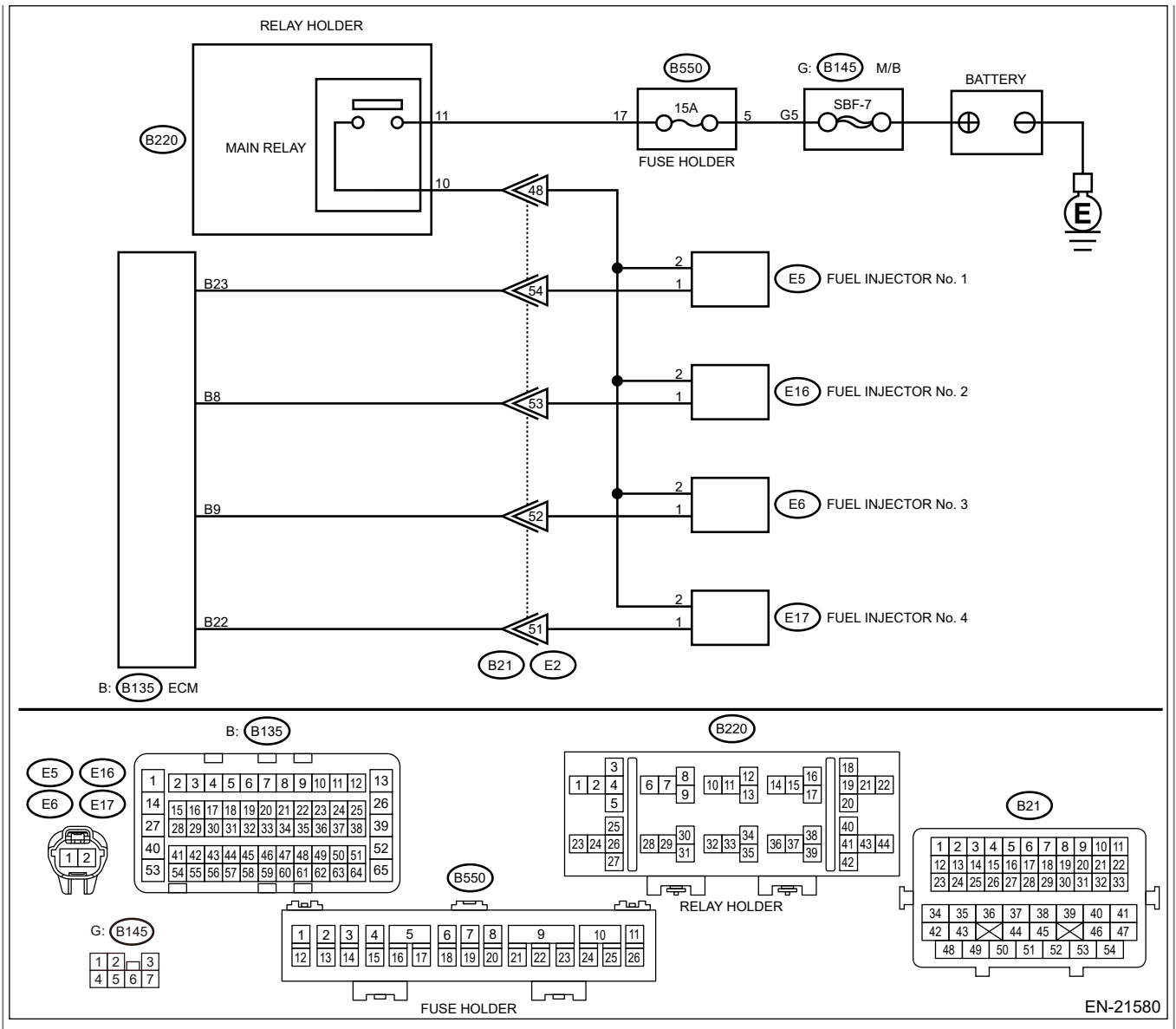




EN-22322







1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.

Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

Connector & terminal

(E158) No. 46 — (E24) No. 3:

(E158) No. 33 — (E24) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit of harness between ECM connector and front oxygen (A/F) sensor connector.

3. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(E158) No. 46 — Chassis ground:

(E158) No. 33 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair the short circuit to ground in harness between ECM connector and front oxygen (A/F) sensor connector.

4. CHECK OUTPUT SIGNAL FOR ECM.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.

Connector & terminal


(E24) No. 3 (+) — Chassis ground (-):

Is the voltage 4.5 V or more?

Yes

 [Go to 6.](#)

No

 [Go to 5.](#)

5. CHECK OUTPUT SIGNAL FOR ECM.


Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.

Connector & terminal


(E24) No. 4 (+) — Chassis ground (–):

Is the voltage 4.95 V or more?

Yes

 [Go to 6.](#)

No

 [Go to 7.](#)

6. CHECK OUTPUT SIGNAL FOR ECM.

Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.


Connector & terminal

(E24) No. 3 (+) — Chassis ground (–):

(E24) No. 4 (+) — Chassis ground (–):

Is the voltage 8 V or more?

Yes

Repair the short circuit to power in the harness between ECM connector and front oxygen (A/F) sensor connector. After repair, replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)

No

Repair the poor contact of ECM connector.


7. CHECK EXHAUST SYSTEM.

Are there holes or loose bolts on exhaust system?

Yes

Repair the exhaust system.

No

 [Go to 8.](#)

8. CHECK AIR INTAKE SYSTEM.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes

Repair the air intake system.

No

 [Go to 9.](#)


9. CHECK FUEL PRESSURE.

Warning:

Place “NO OPEN FLAMES” signs near the working area.

Caution:

Be careful not to spill fuel.


1. Connect the front oxygen (A/F) sensor connector.
2. Measure the fuel pressure.  [Ref. to MECHANICAL\(H4DO\)>Fuel Pressure>INSPECTION.](#)

Caution:



Before attaching/detaching a fuel pressure gauge, release the fuel pressure.

Is the measured value 340 — 400 kPa (3.5 — 4.1 kg/cm², 49 — 58 psi)?

Yes

 [Go to 10.](#)

No

Check the fuel pump and fuel delivery line.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Pump>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Delivery and Evaporation Lines>INSPECTION.](#)

10. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Coolant Temp.].

Note:

- **Subaru Select Monitor**


For detailed procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)

- **General scan tool**


For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Coolant Temp.] 75°C (167°F) or more?

Yes

 [Go to 11.](#)

No

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Coolant Temperature Sensor.](#)

11. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. For CVT models, set the select lever to "P" range or "N" range, and for MT models, place the shift lever in the neutral position.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Using the Subaru Select Monitor or a general scan tool, read the value of [Mass Air Flow].

Note:

- **Subaru Select Monitor**


For detailed procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)

- **General scan tool**


For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Mass Air Flow] 2.0 — 5.0 g/s (0.26 — 0.66 lb/m)?

Yes

 [Go to 12.](#)


No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

12. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.


1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. For CVT models, set the select lever to "P" range or "N" range, and for MT models, place the shift lever in the neutral position.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Open the front hood.
6. Measure the ambient temperature.
7. Using the Subaru Select Monitor or a general scan tool, read the value of [Intake Air Temp.].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Subtract ambient temperature from [Intake Air Temp.]. Is the obtained value $-10 - 50^{\circ}\text{C}$ ($-18 - 90^{\circ}\text{F}$)?

Yes

 [Go to 13.](#)


No

Check the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

13. CHECK REAR OXYGEN SENSOR DATA.


1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and keep the engine speed at 3,000 rpm. (2 minutes maximum)
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

Note:

- **Depress the clutch pedal (MT model)**
- **Subaru Select Monitor**
For detailed procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Oxygen sensor #12] 0.490 V or more?

Yes

 [Go to 14.](#)

No


 [Go to 15.](#)

14. CHECK REAR OXYGEN SENSOR DATA.

1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and rapidly reduce the engine speed from 3,000 rpm.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor

#12].

Note:


- **Depress the clutch pedal (MT model)**
- **Subaru Select Monitor**
For detailed procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Oxygen sensor #12] 0.250 V or less?

Yes

 [Go to 16.](#)

No

 [Go to 15.](#)

15. CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.

Has water entered the connector?

Yes

Completely remove any water inside.


No

 [Go to 17.](#)



16. CHECK FRONT OXYGEN (A/F) SENSOR USING REAR OXYGEN SENSOR SIGNAL.

1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), then keep the engine idling for 5 minutes or more.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to the Data Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.


Is the value of [Oxygen sensor #12] kept at 0.250 V or less for 5 minutes or more?

 Replace the front oxygen (A/F) sensor.  [Ref. to FUEL INJECTION \(FUEL](#)

Yes

[SYSTEMS\)\(H4DO\)>Front Oxygen \(A/F\) Sensor.](#)

No

 [Go to 17.](#)

17. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from rear oxygen sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.


Connector & terminal

(E158) No. 57 — (E25) No. 3:

(E158) No. 56 — (E25) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 18.](#)

No

Repair the open circuit of harness between ECM connector and rear oxygen sensor connector.

18. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.


1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between rear oxygen sensor connector and chassis ground.

Connector & terminal


(E25) No. 3 (+) — Chassis ground (-):

Is the voltage 0.2 — 0.5 V?

Yes

Replace the rear oxygen sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Front Oxygen \(A/F\) Sensor.](#)

No

 [Go to 19.](#)

19. CHECK OUTPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and chassis ground on faulty cylinders.

Connector & terminal

DTC P219C; #1 (E158) No. 23 (+) — Chassis ground (-):

DTC P219D; #2 (E158) No. 8 (+) — Chassis ground (-):

DTC P219E; #3 (E158) No. 9 (+) — Chassis ground (-):


DTC P219F; #4 (E158) No. 22 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 24.](#)

No

 [Go to 20.](#)

20. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector on faulty cylinders.
3. Measure the resistance between fuel injector connector and engine ground on faulty cylinders.

Connector & terminal

DTC P219C; #1 (E5) No. 1 — Engine ground:


DTC P219D; #2 (E16) No. 1 — Engine ground:

DTC P219E; #3 (E6) No. 1 — Engine ground:

DTC P219F; #4 (E17) No. 1 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 21.](#)

No

Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

21. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.



Measure the resistance of harness between ECM and fuel injector connector on faulty cylinders.

Connector & terminal

DTC P219C; #1 (E158) No. 23 — (E5) No. 1:


DTC P219D; #2 (E158) No. 8 — (E16) No. 1:

DTC P219E; #3 (E158) No. 9 — (E6) No. 1:

DTC P219F; #4 (E158) No. 22 — (E17) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 22.](#)

No

Open circuit in harness between ECM connector and fuel injector connector

22. CHECK FUEL INJECTOR.


Measure the resistance between fuel injector terminals on faulty cylinder.

Terminals


No. 1 —No. 2:

Is the resistance 5 — 20 Ω ?

Yes

 [Go to 23.](#)

No

Replace the faulty fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Injector.](#)

23. CHECK POWER SUPPLY LINE.

1. Turn the ignition switch to ON.
2. Measure the voltage between fuel injector connector of faulty cylinders and engine ground.

Connector & terminal

DTC P219C; #1 (E5) No. 2 (+) — Engine ground (-):

DTC P219D; #2 (E16) No. 2 (+) — Engine ground (-):

DTC P219E; #3 (E6) No. 2 (+) — Engine ground (-):

DTC P219F; #4 (E17) No. 2 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

Repair the poor contact of all connectors in fuel injector circuit.

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between the main relay and fuel injector connector on faulty cylinders**
- **Poor contact of coupling connector**
- **Poor contact of main relay connector**

24. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector on faulty cylinders.
3. Turn the ignition switch to ON.
4. Measure the voltage between ECM and chassis ground on faulty cylinders.

Connector & terminal

DTC P219C; #1 (E158) No. 23 (+) — Chassis ground (-):

DTC P219D; #2 (E158) No. 8 (+) — Chassis ground (-):

DTC P219E; #3 (E158) No. 9 (+) — Chassis ground (-):


DTC P219F; #4 (E158) No. 22 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power in harness between ECM connector and fuel injector connectors.

No

 [Go to 25.](#)

25. CHECK FUEL INJECTOR.




1. Turn the ignition switch to OFF.
2. Measure the resistance between fuel injector terminals on faulty cylinder.

Terminals


No. 1 —No. 2:

Is the resistance 5 — 20 Ω ?

Yes

 [Go to 26.](#)

No


Replace the faulty fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Injector.](#)

26. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR/CRANKSHAFT POSITION SENSOR.




Is the camshaft position sensor or crankshaft position sensor loosely installed?

Yes

Tighten the camshaft position sensor or crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Camshaft Position](#)

[Sensor>INSTALLATION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Crankshaft Position Sensor>INSTALLATION.](#)


No

 [Go to 27.](#)


27. CHECK CRANKSHAFT POSITION SENSOR PLATE.

Is the crankshaft position sensor plate rusted or does it have broken teeth?

Yes

Replace the crankshaft position sensor plate.  [Ref. to MECHANICAL\(H4DO\)>Cylinder Block.](#)

No

 [Go to 28.](#)


28. CHECK INSTALLATION CONDITION OF TIMING CHAIN.

Turn the crankshaft using ST, and align the alignment mark on crank sprocket with alignment mark on cylinder block.

ST 18252AA000 CRANKSHAFT SOCKET

Is the timing chain dislocated from its proper position?

Yes

Correct the installation condition of timing chain.  [Ref. to MECHANICAL\(H4DO\)>Timing Chain Assembly.](#)


No

 [Go to 29.](#)


29. CHECK FUEL LEVEL.

Is the fuel meter indication higher than the "Lower" level?


Yes

 [Go to 30.](#)

No

Refill the fuel so that the fuel meter indication is higher than the "Lower" level, and proceed to the next step.  [Go to 30.](#)

30. CHECK STATUS OF MALFUNCTION INDICATOR LIGHT.


1. Clear the memory using the Subaru Select Monitor or general scan tool.  [Ref. to](#)

[ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)


2. Start the engine, and drive the vehicle 10 minutes or more.

Does the malfunction indicator light illuminate or blink?

Yes

 [Go to 32.](#)

No

 [Go to 31.](#)

31. CHECK CAUSE OF MISFIRE.

Was the cause of misfire identified when the engine is running?

Yes

Finish diagnostics operation, if the engine has no abnormality.

No

Repair the poor contact of connector.

Note:

In this case, repair the following item:

- **Poor contact of ignition coil connector**
- **Poor contact of fuel injector connector on faulty cylinders**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

32. CHECK AIR INTAKE SYSTEM.

Is there any fault in air intake system?

Yes


Repair the air intake system.

Note:

Check the following items.


- **Are there air leaks or air suction caused by loose or dislocated nuts and bolts?**
- **Are there cracks or any disconnection of hoses?**

No

 [Go to 33.](#)


33. CHECK MISFIRE SYMPTOM.

1. Turn the ignition switch to ON.


2. Check for DTC.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)

Does the Subaru Select Monitor or general scan tool indicate only one DTC?

Yes

 [Go to 36.](#)

No

 [Go to 34.](#)


34. CHECK DTC.

Is DTC P0301 and P0303 displayed on the Subaru Select Monitor or general scan tool?

Yes

 [Go to 37.](#)


No

 [Go to 35.](#)

35. CHECK DTC.

Is DTC P0302 and P0304 displayed on the Subaru Select Monitor or general scan tool?

Yes

 [Go to 38.](#)

No

 [Go to 39.](#)

36. ONLY ONE CYLINDER.

Is there any fault in the cylinder?

Yes


Repair or replace faulty parts.

Note:

Check the following items.

- **Spark plug**
- **Ignition coil**
- **Fuel injector**
- **Compression ratio**

No

Go to DTC P0171.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0171 SYSTEM TOO LEAN BANK 1.](#)

37. GROUP OF #1 AND #3 CYLINDERS.



Are there any faults in #1 and #3 cylinders?

Yes


Repair or replace faulty parts.

Note:

Check the following items.

- **Spark plug**
- **Ignition coil**
- **Fuel injector**
- **Compression ratio**
- **Skipping timing belt teeth**

No

Go to DTC P0171.  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0171 SYSTEM TOO LEAN BANK 1.](#)

38. GROUP OF #2 AND #4 CYLINDERS.



Are there any faults in #2 and #4 cylinders?

Yes


Repair or replace faulty parts.

Note:

Check the following items.

- **Spark plug**
- **Ignition coil**
- **Fuel injector**
- **Compression ratio**
- **Skipping timing belt teeth**

No


Go to DTC P0171.  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0171 SYSTEM TOO LEAN BANK 1.](#)

39. CYLINDER AT RANDOM.



Is the engine idle rough?

Yes

Go to DTC P0171.  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0171 SYSTEM TOO LEAN BANK 1.](#)

Even if DTC is detected, the circuit has returned to a normal condition at this

No

time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary open or short circuit of harness or temporary poor contact of connector may be the cause.

1. OUTLINE OF DIAGNOSIS

To detect malfunctions, the diagnostic uses a predictive model, individual cylinder fuel control, and the primary oxygen sensor measurement. The diagnostic does not directly attempt to separate the primary oxygen sensor measurement into individual cylinder contributions, but uses a predictive model to do so. Individual cylinders STFT are independently adjusted to obtain the moving 720 degree average lambda of all four cylinders using feedback from primary oxygen sensor. If any individual cylinder's STFT is different than the average of the other cylinder's STFT by a calibratable amount, that cylinder will be identified as failing.

Monitor Method

This diagnostic monitor performs a functional check of the fuel system to determine an air-fuel ratio cylinder imbalance, as required by the regulations in Section (e)(6.2.1)(c). This method uses a parameter called "imbalance value" which is calculated for each cylinder. The "imbalance value" is the difference between the individual STFT of the specific cylinder and the average value of the individual STFT of the other three cylinders. These imbalance values are compared to each other in order to determine the "imbalanced cylinder", which is the cylinder with the maximum "imbalance value". A diagnostic value is calculated for the "imbalanced cylinder". When this diagnostic value is more than the predetermined threshold (lean malfunction) or less than the predetermined threshold (rich malfunction), a DTC for the most imbalanced cylinder is determined.

DTC for "Imbalanced cylinder" is following.

P219C: Cylinder 1 Air-Fuel Ratio Imbalance

P219D: Cylinder 2 Air-Fuel Ratio Imbalance

P219E: Cylinder 3 Air-Fuel Ratio Imbalance

P219F: Cylinder 4 Air-Fuel Ratio Imbalance

Malfunction Criteria.

Rich malfunction (negative) Diagnostic value < Threshold

or

Lean malfunction (positive) Diagnostic value > Threshold

Diagnostic value = "Imbalance value n" of the "Imbalanced cylinder"

(n: Cylinder number (#1 or #2 or #3 or #4))

•Imbalance value n = iSTFTn - Average (other 3 iSTFTs)

For example: Imbalance value #1 = iSTFT # 1 - (iSTFT # 2 + iSTFT # 3 + iSTFT # 4) / 3.

•Imbalanced cylinder: The cylinder with maximum (ABS (Imbalance value #1, #2, #3, #4)) is selected

•iSTFT: Individual cylinder STFT (Refer to the following about the detail)

Individual Cylinder STFT (iSTFT n (k))

Individual cylinder STFT (= iSTFT n (k)) are calculated by integral control and individual cylinder λ deviation $u(k)$ converges to target (no deviation).

$iSTFT\ n\ (k) = iSTFT\ n\ (k-1) + C(tgt - u(k))$

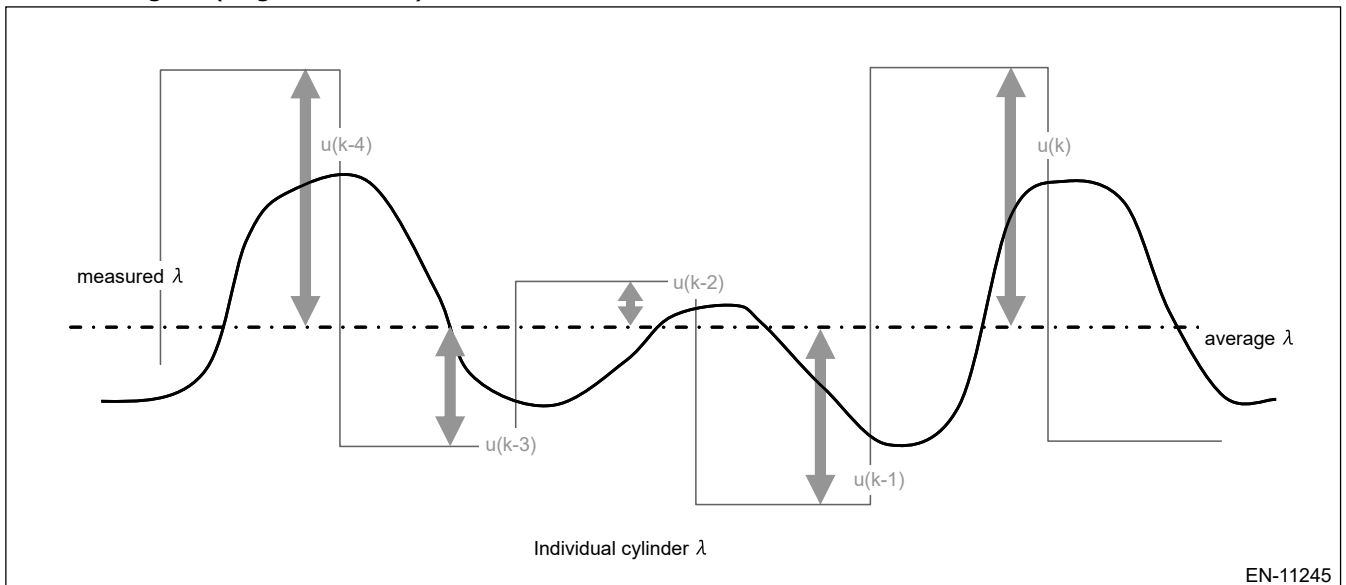
iSTFT n (k) = Individual cylinder STFT

$u(k)$: Estimated individual cylinder λ deviation*

tgt: Target (No deviation = zero)

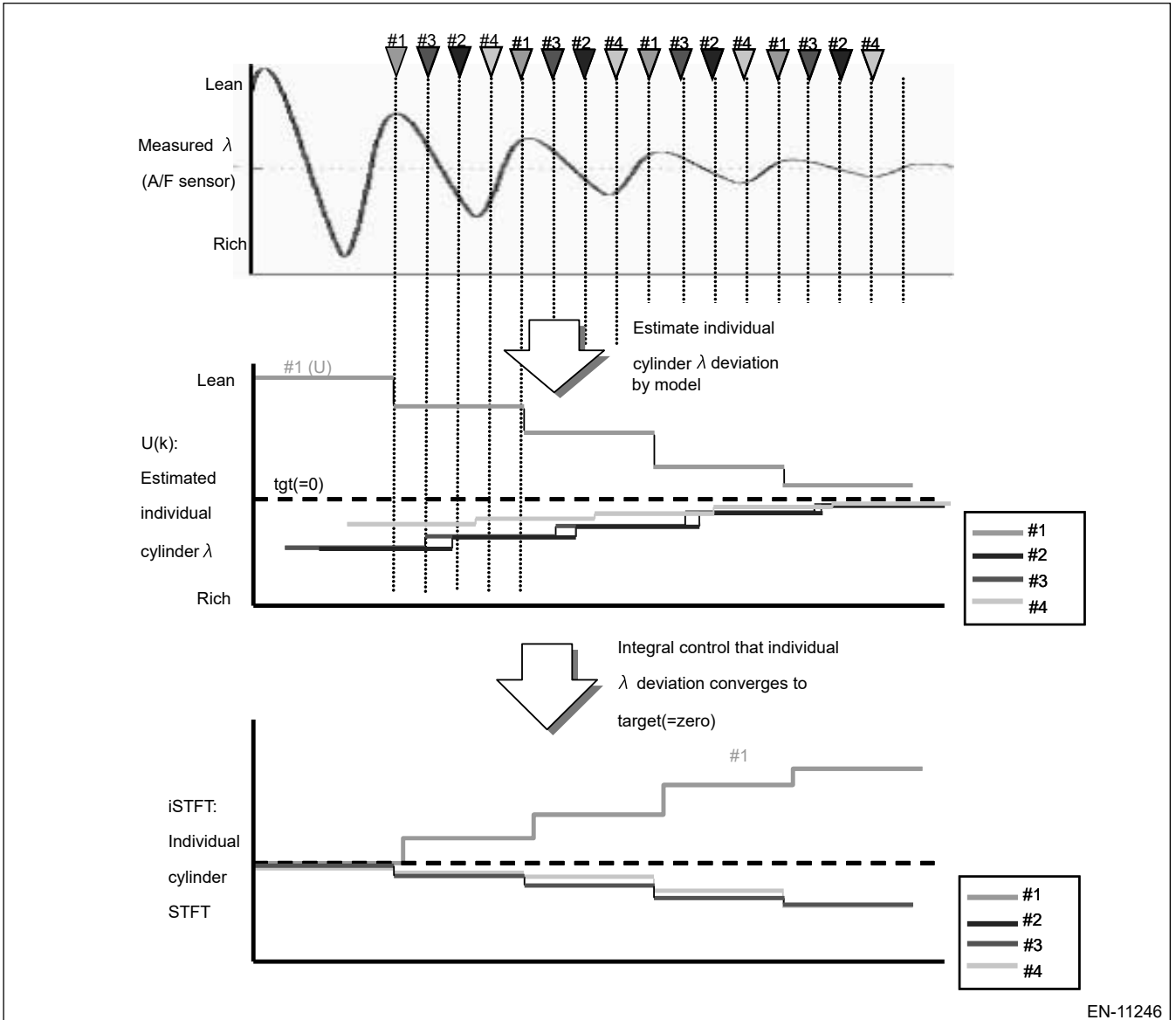
C: Control gain (negative value)

C: Control gain (negative value)



*individual cylinder λ deviation: $u(k)$

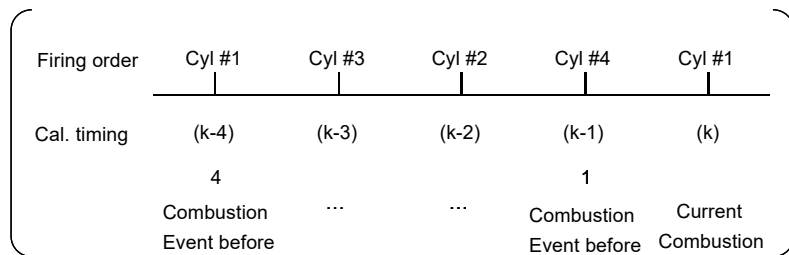
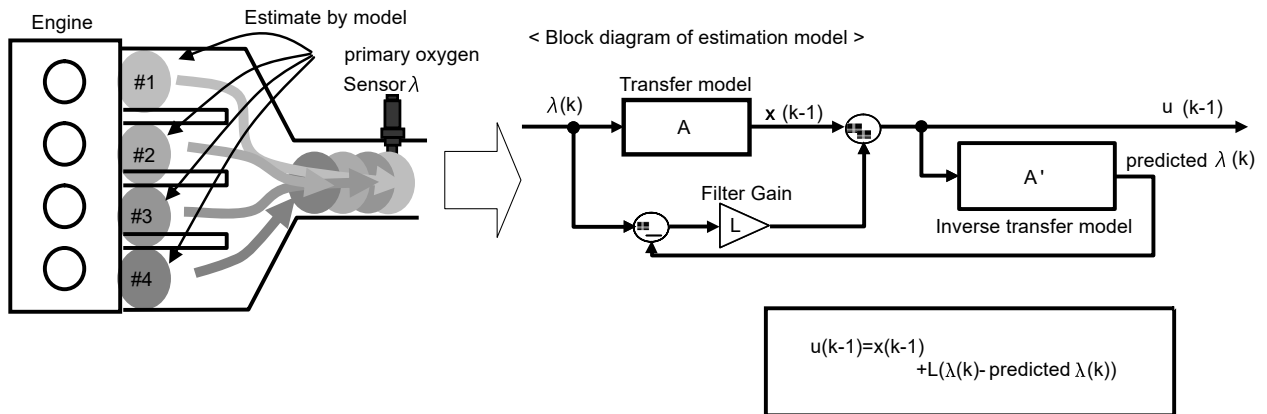
= Individual cylinder λ - average λ during 720°CA



Estimated individual cylinder λ deviation "u(k)" is calculated by model (as described below).

Estimation Model for individual cylinder λ deviation (u(k))

Subaru developed a model for estimating individual cylinder λ deviation* by the output signal of the primary oxygen sensor (mounted on the collector section of the exhaust manifold). This estimation model makes it possible to control cylinder A/F individually. The estimation model is designed as follows.



$\lambda(k)$: Measured λ

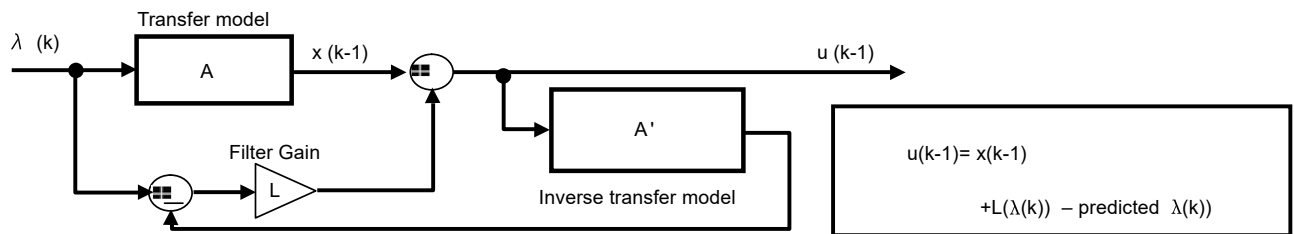
$u(k-1)$: Estimated individual cylinder λ deviation (after filter)

$x(k-1)$: Estimated individual cylinder λ deviation (before filter)

predicted $\lambda(k)$: Estimated λ

Model equations for individual cylinder λ deviation ($u(k)$)

" $u(k-1)$ ": Estimated individual cylinder λ deviation is calculated by the following model.



< Model equations >

Transfer model "A" Measured λ (A/F sensor) \rightarrow Individual cylinder λ

$$x(k-1) = \frac{(\lambda(k) - a_1 \lambda(k-1) - a_2 \lambda(k-2) - a_3 \lambda(k-3) - a_4 \lambda(k-4))}{b_1} - \frac{(b_2 x(k-2) + b_3 x(k-3) + b_4 x(k-4))}{b_1}$$

Inverse transfer model "A'" Individual cylinder $\lambda \rightarrow$ Measured λ (A/F sensor)

$$\text{predicted } \lambda(k) = -a_1 \text{predicted } \lambda(k-1) + a_2 \text{predicted } \lambda(k-2) + a_3 \text{predicted } \lambda(k-3) + a_4 \text{predicted } \lambda(k-4) + (b_1 u(k-1) + b_2 u(k-2) + b_3 u(k-3) + b_4 u(k-4))$$

EN-11248

$a_1 \sim 4, b_1 \sim 4$: Model parameters calibrated by primary oxygen sensor output λ and 'measured' individual cylinder λ .
(These parameters are calibrated and fixed prior to production. However these models are calculating the predicted λ of each cylinder during real world driving.)

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Status of each cylinder correction value = Accumulated time since operation started* (Refer to Table) *Accumulated time is cumulatively calculated (If the secondary parameter is not satisfied for the status of	$\geq 400 \text{time(s)}$ (12.8 sec)

each cylinder correction value, accumulated time will not be reset)	
---	--

Table: Status of each cylinder correction value

Secondary Parameters	Execution condition
Main feedback	In operation
Engine speed	≤ 4000rpm
Engine load	≥ 0.6 g/rev
Amount of intake air	≥ 10 g/sec

3. GENERAL DRIVING CYCLE

Perform the diagnosis every time after the enable conditions have been established.

4. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Imbalance value n of imbalance cylinder	> 0.2 or < -0.5
Imbalance value n = i correction value n - average value (i correction value n of other three cylinders) i correction value n = correction value of each cylinder	
Imbalance cylinder: Maximum value of cylinder (absolute value (imbalance value n)) (n: Any of cylinder numbers (#1, #2, #3, #4))	


Time needed for diagnosis: 300time(s) (9.6 sec)

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P219D CYLINDER 2 AIR-FUEL RATIO IMBALANCE


Note:

For the diagnostic procedure, refer to DTC P219C.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P219C CYLINDER 1 AIR-FUEL RATIO IMBALANCE.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P219E CYLINDER 3 AIR-FUEL RATIO IMBALANCE


Note:

For the diagnostic procedure, refer to DTC P219C.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P219C CYLINDER 1 AIR-FUEL RATIO IMBALANCE.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P219F CYLINDER 4 AIR-FUEL RATIO IMBALANCE

Note:

For the diagnostic procedure, refer to DTC P219C.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P219C CYLINDER 1 AIR-FUEL RATIO IMBALANCE.](#)



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2270 O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 2

DTC detecting condition:

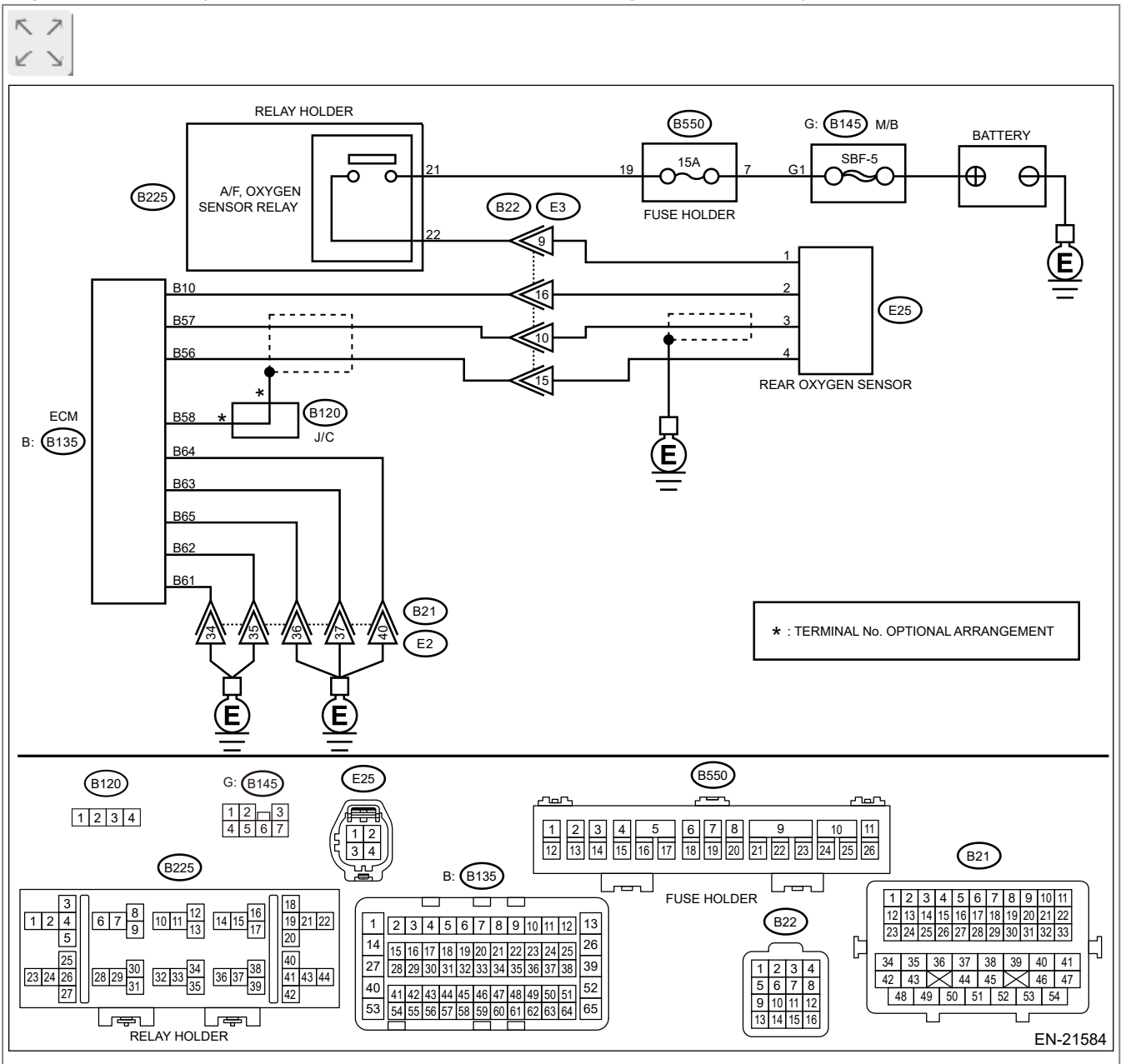
Detected when two consecutive driving cycles with fault occur.

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.

Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from rear oxygen sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.

Connector & terminal

(B135) No. 57 — (E25) No. 3:

(B135) No. 56 — (E25) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and rear oxygen sensor connector**
- **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between rear oxygen sensor connector and chassis ground.

Connector & terminal


(E25) No. 4 (+) — Chassis ground (-):

Is the voltage 1.48 V or more?

Yes

 [Go to 4.](#)

No

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)

4. CHECK EXHAUST SYSTEM.

Check exhaust system parts.

Note:

Check the following items.


- **Looseness and improper fitting of exhaust system parts**
- **Damage (crack, hole etc.) of parts**
- **Loose part and improper installation between front oxygen (A/F) sensor and rear oxygen sensor**

Is there any fault in exhaust system?

Yes

Repair or replace faulty parts.

No

Replace the rear oxygen sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Rear Oxygen Sensor.](#)

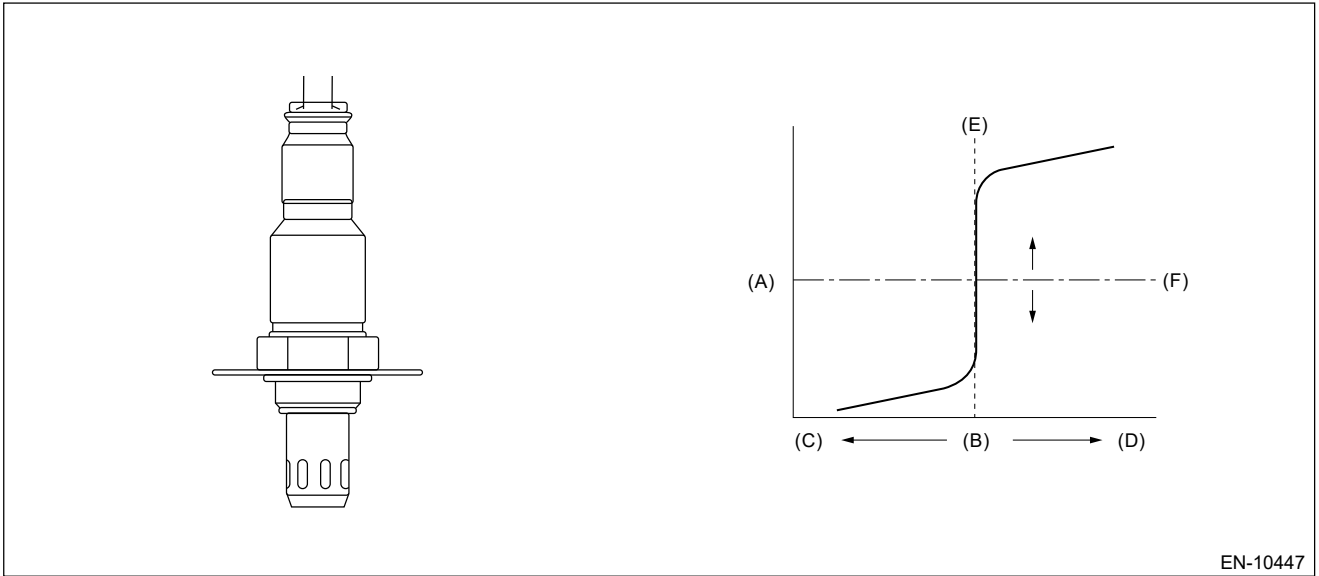
1. OUTLINE OF DIAGNOSIS

Detect the stuck of rear oxygen sensor voltage in lean state.

When rear oxygen sensor voltage remains below the threshold value for predetermined time, diagnosis interrupts target air fuel ratio for control and raises output voltage.

Judge as NG detecting the stuck in lean state when rear oxygen sensor voltage remains below the threshold value even after the interrupt control.

2. COMPONENT DESCRIPTION



EN-10447

- (A) Electromotive force (B) Air fuel ratio (C) Lean
 (D) Rich (E) Theoretical air fuel ratio (F) Comparative voltage

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Sub feedback	In operation
Amount of intake air	$\geq 10\text{g/s}$ (0.35oz/s)
Estimated temperature of the rear oxygen sensor element	$\geq 500^\circ\text{C}$ (932°F)
Enable conditions at interrupt control are as follows	
Air fuel ratio reduced from target air fuel ratio	= Value of Map
Continuous time when rear oxygen sensor output voltage is less than 0.5 V	$\geq 5000\text{ms}$

Map

Output voltage of rear oxygen sensor V	0.0	0.1	0.2	0.4	0.6
Air fuel ratio reduced from target air fuel ratio %	15	15	4	4	4

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage of rear oxygen sensor	< 0.55V

Time needed for diagnosis: 15000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2271 O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 2

DTC detecting condition:

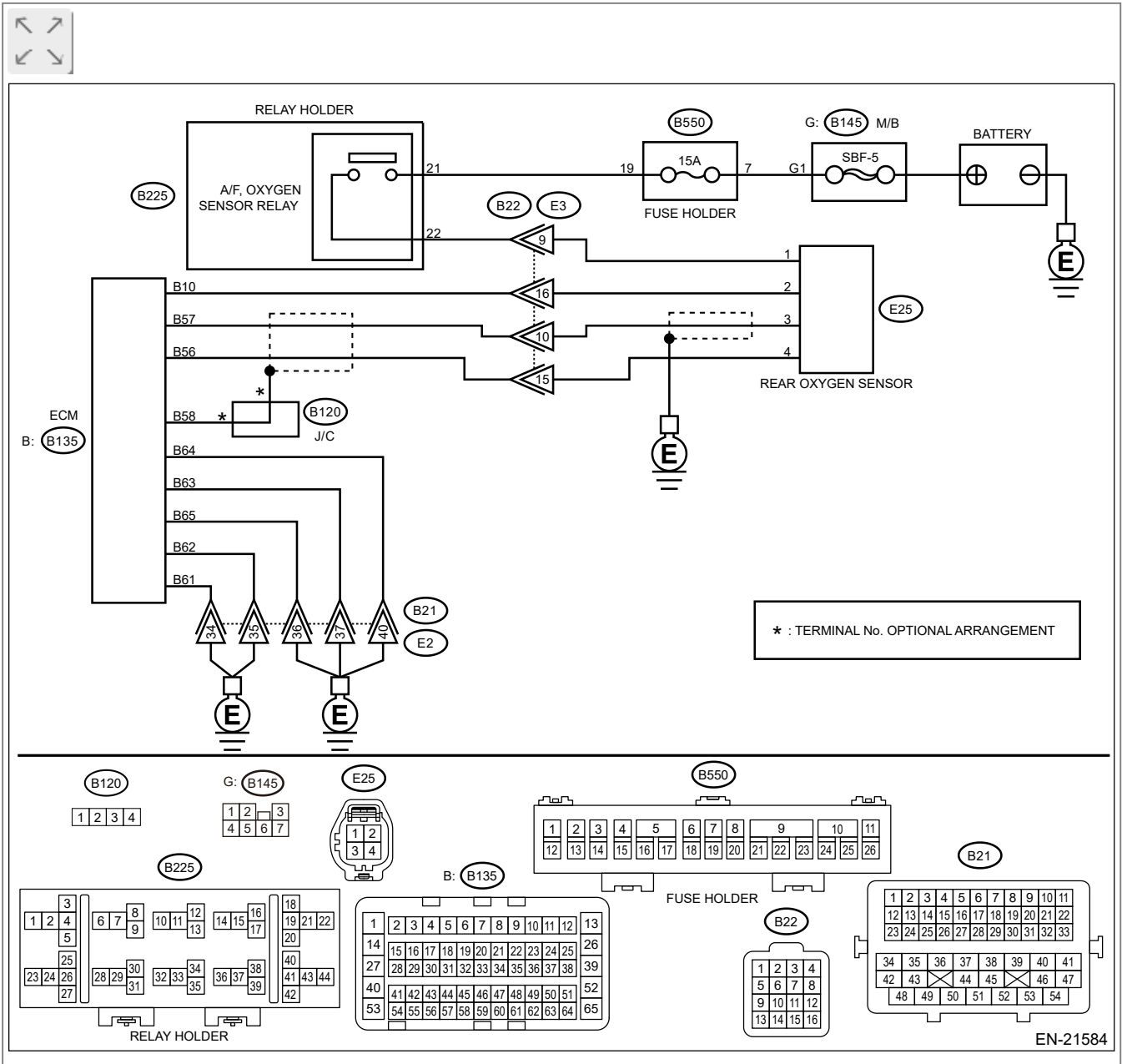
Detected when two consecutive driving cycles with fault occur.

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)




1. CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.

Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from rear oxygen sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.

Connector & terminal

(B135) No. 57 — (E25) No. 3:

(B135) No. 56 — (E25) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and rear oxygen sensor connector**
- **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.

Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B135) No. 57 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair the short circuit to ground in harness between ECM connector and rear oxygen sensor connector.

4. CHECK EXHAUST SYSTEM.



Check exhaust system parts.

Note:

Check the following items.


- **Looseness and improper fitting of exhaust system parts**
- **Damage (crack, hole etc.) of parts**
- **Loose part and improper installation between front oxygen (A/F) sensor and rear oxygen sensor**

Is there any fault in exhaust system?

Yes

Repair or replace faulty parts.

No

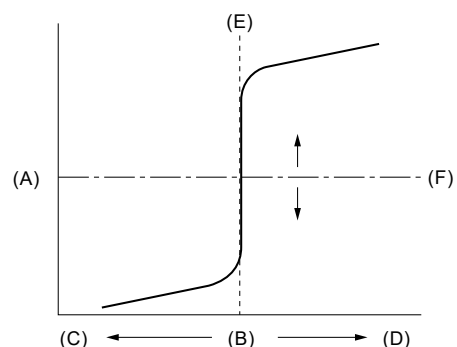
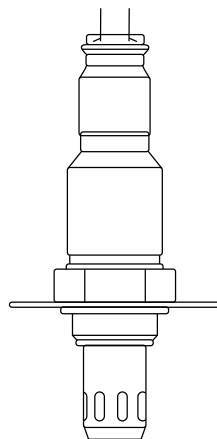
Replace the rear oxygen sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Rear Oxygen Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the stuck of rear oxygen sensor voltage in rich state.

Detect the stuck in rich state and judge as NG if rear oxygen sensor voltage remains above the threshold value for predetermined time.

2. COMPONENT DESCRIPTION



EN-10447

(A) Electromotive force

(B) Air fuel ratio

(C) Lean

(D) Rich

(E) Theoretical air fuel ratio

(F) Comparative voltage

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Deceleration fuel cut for 5000 ms or more	Experienced
Estimated temperature of the rear oxygen sensor element	$\geq 500^{\circ}\text{C}$ (932°F)

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage of rear oxygen sensor	$> 0.15\text{V}$

Time needed for diagnosis: 500ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2401 EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT LOW

DTC detecting condition:

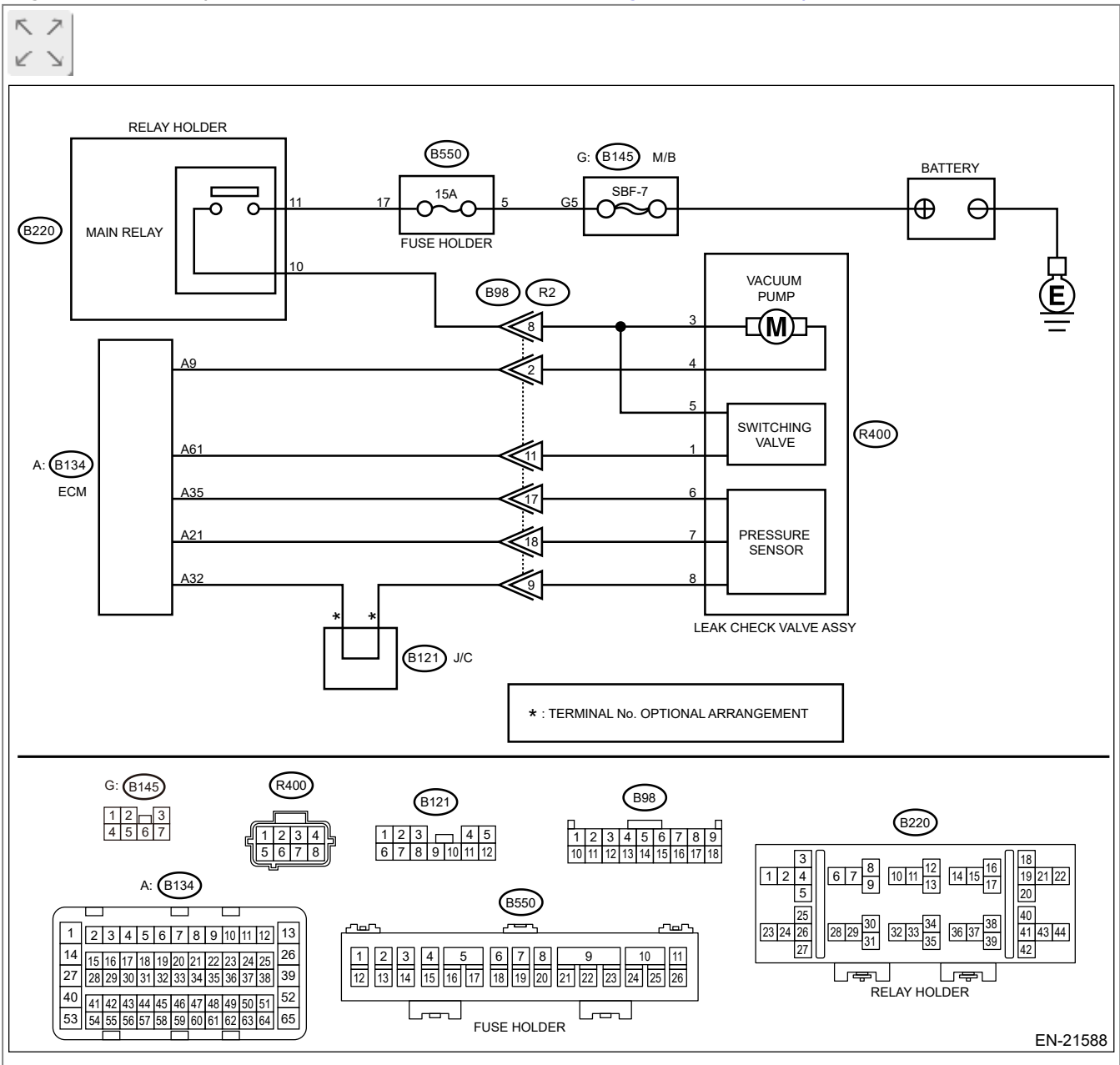
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.




1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and chassis ground.

Connector & terminal


(B134) No. 9 (+) – Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

 [Go to 3.](#)

2. CHECK FOR POOR CONTACT.



Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes

Repair the poor contact of ECM connector.

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary open or short circuit of harness or temporary poor contact of connector may be the cause.

3. CHECK POWER SUPPLY TO LEAK CHECK VALVE ASSEMBLY.




Measure the voltage between the leak check valve assembly connector and engine ground.

Connector & terminal

(R400) No. 3 (+) – Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

Repair the power supply circuit.

4. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the leak check valve assembly.
3. Disconnect the connector from ECM.
4. Measure the resistance between leak check valve assembly and chassis ground.

Connector & terminal

(R400) No. 4 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM connector and leak check valve assembly connector.

5. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.



Measure the resistance of harness between ECM connector and the leak check valve assembly connector.

Connector & terminal

(B134) No. 9 — (R400) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 6.](#)

No

repair the harness and connector.


Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and the leak check valve assembly connector**
- **Poor contact of coupling connector**

6. CHECK LEAK CHECK VALVE ASSEMBLY.



Check the vacuum pump of the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Leak Check Valve Assembly>INSPECTION > CHECK VACUUM PUMP.](#)

Is the vacuum pump of the leak check valve assembly OK?

Yes

Repair the poor contact in the leak check valve assembly connector.

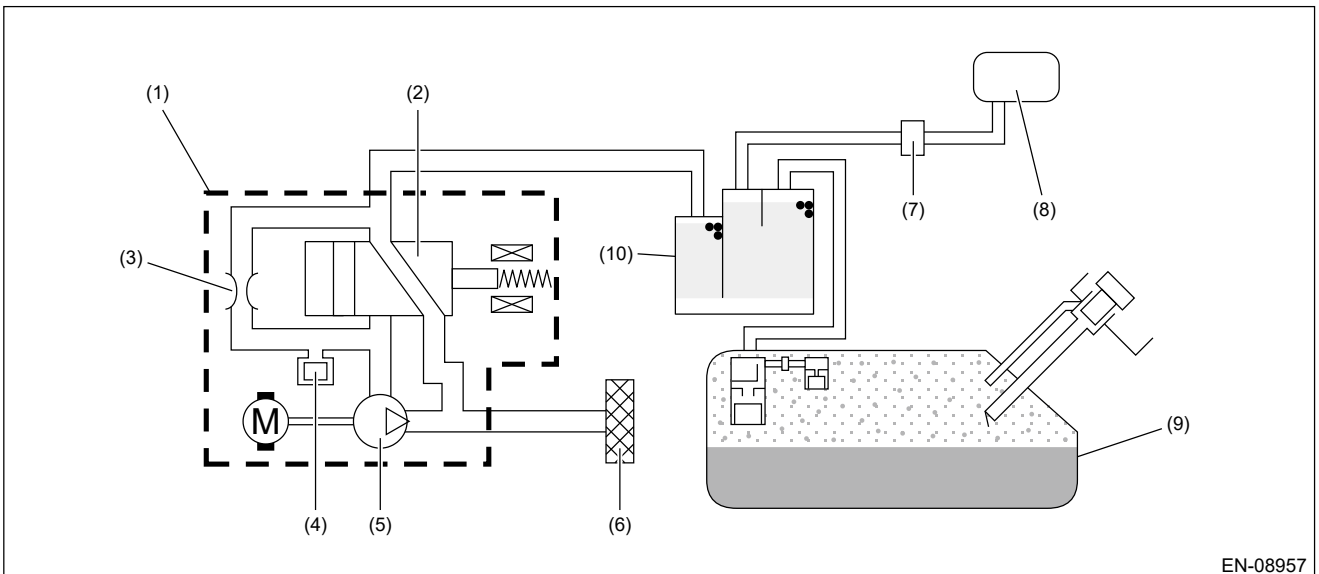
No

Replace the leak check valve assembly. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Leak Check Valve Assembly.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit in Evaporative Leak Check Module vacuum pump.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



- | | | |
|---|----------------------------------|---------------|
| (1) Leak check valve ASSY | (5) Vacuum pump | (9) Fuel tank |
| (2) Switching valve | (6) Drain filter | (10) Canister |
| (3) Reference orifice (0.02 inch orifice) | (7) Purge control solenoid valve | |
| (4) Pressure sensor | (8) Intake manifold | |

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9
Evaporative Leak Check Module vacuum pump drive signal	OFF

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	\leq Battery voltage $\times 0.34$ V

Time needed for diagnosis: 2500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2402 EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT HIGH

DTC detecting condition:

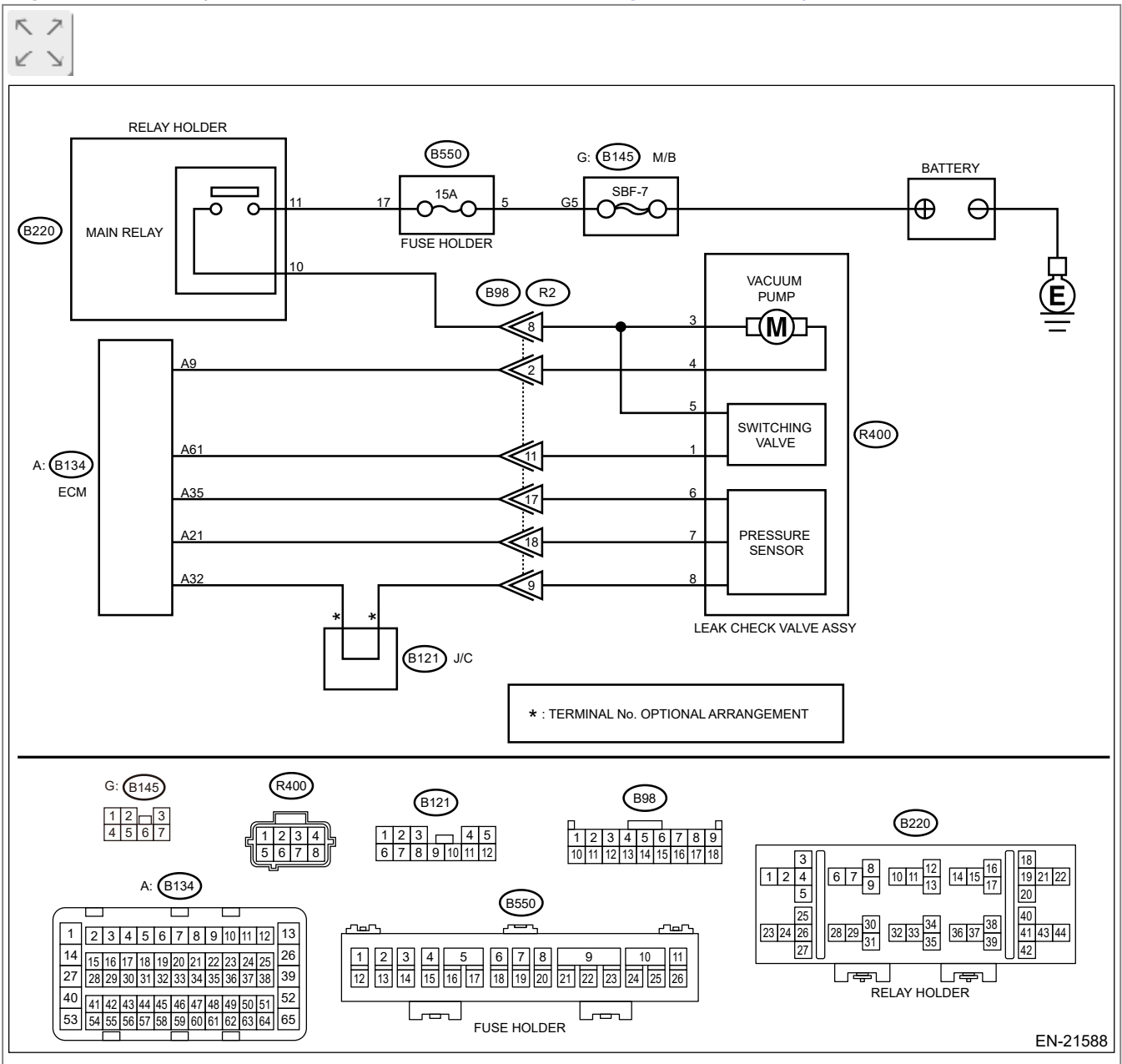
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the leak check valve assembly.
3. Turn the ignition switch to ON.
4. Measure the voltage between leak check valve assembly and chassis ground.

Connector & terminal


(R400) No. 4 (+) – Chassis ground (-):

Is the voltage 10 V or more?

Yes


Repair the short circuit to power in harness between ECM connector and leak check valve assembly connector.

No

 [Go to 2.](#)

2. CHECK LEAK CHECK VALVE ASSEMBLY.




1. Turn the ignition switch to OFF.
2. Check the vacuum pump of the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Leak Check Valve Assembly>INSPECTION > CHECK VACUUM PUMP.](#)

Is the vacuum pump of the leak check valve assembly OK?

Yes

Repair the poor contact in the leak check valve assembly connector.

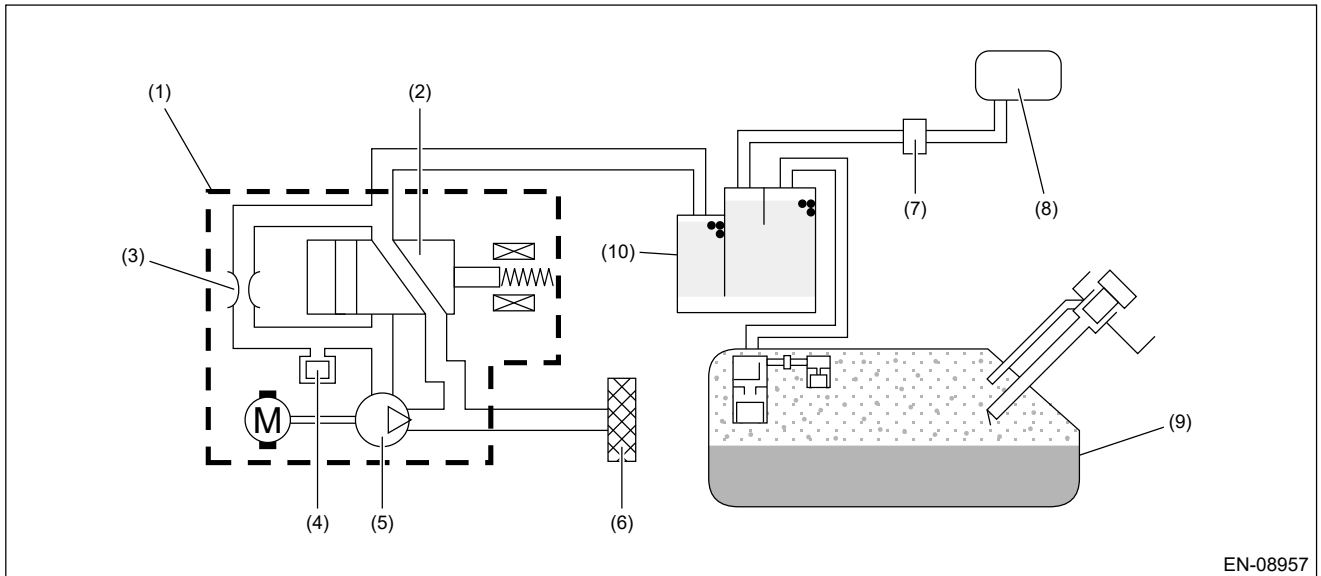
No

Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Leak Check Valve Assembly.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit in Evaporative Leak Check Module vacuum pump.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-08957

- (1) Leak check valve ASSY
- (2) Switching valve
- (3) Reference orifice (0.02 inch orifice)
- (4) Pressure sensor
- (5) Vacuum pump
- (6) Drain filter
- (7) Purge control solenoid valve
- (8) Intake manifold
- (9) Fuel tank
- (10) Canister

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9
Evaporative Leak Check Module vacuum pump drive signal	ON

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output current	$\geq 5A$

Time needed for diagnosis: 2500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2404 EVAP SYSTEM LEAK DETECTION PUMP SENSE CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

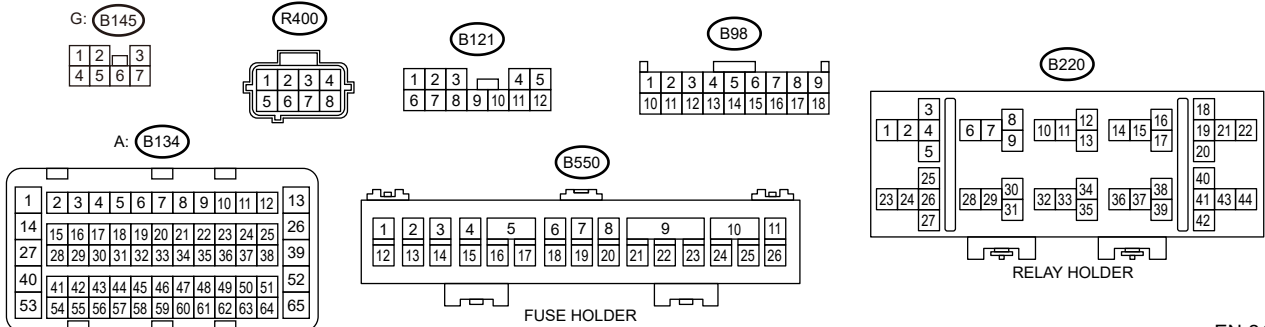
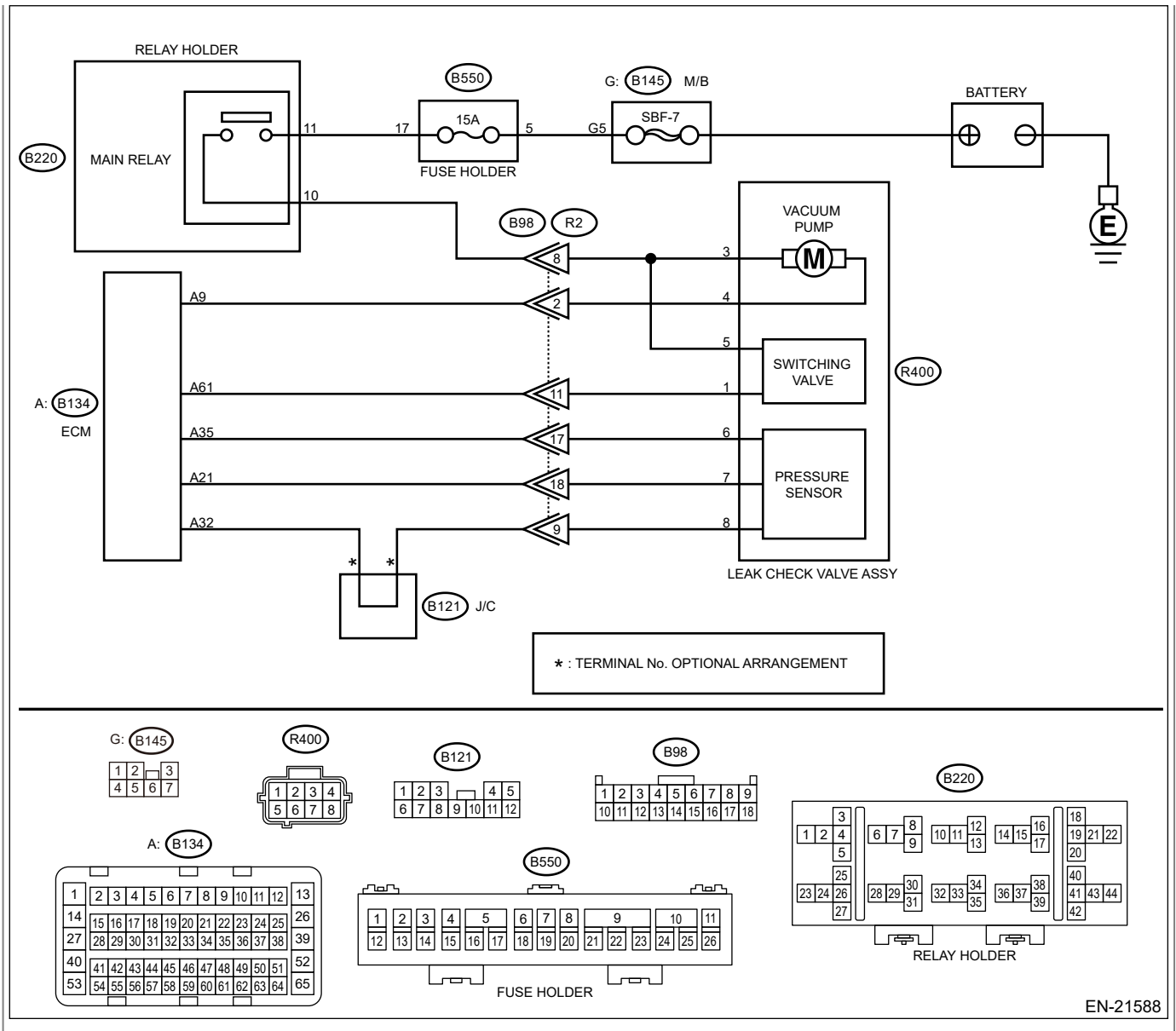
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21588

1. CHECK FOR ANY OTHER DTC ON DISPLAY.



Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".
[Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 2.](#)

2. CHECK LEAK CHECK VALVE ASSEMBLY PUMP.



Using the Subaru Select Monitor, operate the leak check valve assembly pump.

Note:

For detailed procedures, refer to Active Test.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Active Test.](#)

Does the leak check valve assembly pump operate?

Yes

 [Go to 6.](#)

No

 [Go to 3.](#)

3. CHECK POWER SUPPLY OF LEAK CHECK VALVE ASSEMBLY.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the leak check valve assembly.
3. Turn the ignition switch to ON.
4. Measure the voltage between the leak check valve assembly connector and chassis ground.

Connector & terminal

(R400) No. 3 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between the main relay and the leak check valve assembly connector**
- **Poor contact of main relay connector**
- **Poor contact of coupling connector**

4. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and the leak check valve assembly connector.

Connector & terminal

(B134) No. 9 — (R400) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 5.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and the leak check valve assembly connector**
- **Poor contact of coupling connector**

5. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.


1. Measure the resistance of harness between ECM connector and chassis ground.

Connector & terminal

(B134) No. 9 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Leak Check Valve Assembly.](#)

No

Repair the short circuit to ground in harness between ECM connector and leak check valve assembly connector.

6. CHECK LEAK CHECK VALVE ASSEMBLY SWITCHING VALVE.


Using the Subaru Select Monitor, operate the leak check valve assembly switching valve.

Note:

For detailed procedures, refer to Active Test.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Active Test.](#)

Does the leak check valve assembly switching valve operate?

Yes

 [Go to 10.](#)

No

 [Go to 7.](#)

7. CHECK POWER SUPPLY OF LEAK CHECK VALVE ASSEMBLY.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the leak check valve assembly.
3. Turn the ignition switch to ON.
4. Measure the voltage between the leak check valve assembly connector and chassis ground.

Connector & terminal

(R400) No. 5 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 8.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between the main relay and the leak check valve assembly connector**
- **Poor contact of main relay connector**
- **Poor contact of coupling connector**

8. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and the leak check valve assembly connector.

Connector & terminal

(B134) No. 61 — (R400) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 9.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and the leak check valve assembly connector**
- **Poor contact of coupling connector**

9. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.


1. Measure the resistance of harness between ECM connector and chassis ground.

Connector & terminal

(B134) No. 61 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Leak Check Valve Assembly.](#)

No


Repair the short circuit to ground in harness between ECM connector and leak check valve assembly connector.

10. CHECK EVAPORATIVE EMISSION CONTROL SYSTEM.

Perform drive cycle I. [Ref. to Target Not Found](#)

Is DTC P2404 displayed on the display?

Yes

Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Leak Check Valve Assembly.](#)

No


Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0455.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0455 EVAP SYSTEM \(CPC\) LEAK DETECTED \(LARGE LEAK\).](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2419 EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT LOW

DTC detecting condition:

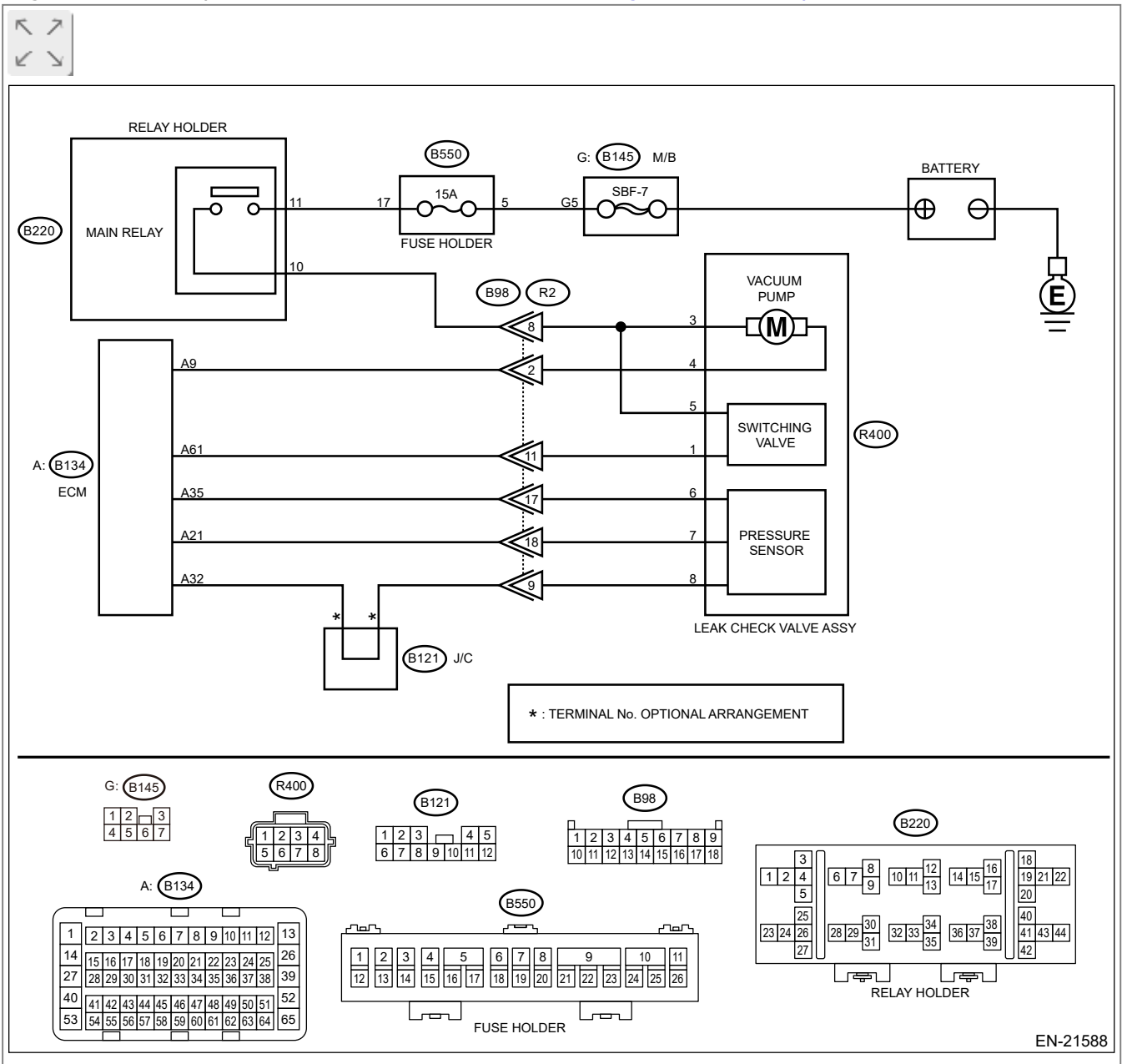
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.



1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and chassis ground.

Connector & terminal


(B135) No. 1 (+) – Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

 [Go to 3.](#)

2. CHECK FOR POOR CONTACT.



Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes

Repair the poor contact of ECM connector.

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary open or short circuit of harness or temporary poor contact of connector may be the cause.

3. CHECK POWER SUPPLY TO LEAK CHECK VALVE ASSEMBLY.




Measure the voltage between the leak check valve assembly connector and engine ground.

Connector & terminal

(R400) No. 5 (+) – Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

Repair the power supply circuit.

4. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from the leak check valve assembly.
3. Disconnect the connector from ECM.
4. Measure the resistance between leak check valve assembly and chassis ground.

Connector & terminal

(R400) No. 1 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM connector and leak check valve assembly connector.

5. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.



Measure the resistance of harness between ECM connector and the leak check valve assembly connector.

Connector & terminal

(B134) No. 61 — (R400) No. 1:

Is the resistance less than 1 Ω?

Yes

 [Go to 6.](#)

No

repair the harness and connector.


Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and the leak check valve assembly connector**
- **Poor contact of coupling connector**

6. CHECK LEAK CHECK VALVE ASSEMBLY.



Check the switching valve of the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Leak Check Valve Assembly>INSPECTION > CHECK SWITCHING VALVE.](#)

Is the switching valve of the leak check valve assembly OK?

Yes

Repair the poor contact in the leak check valve assembly connector.

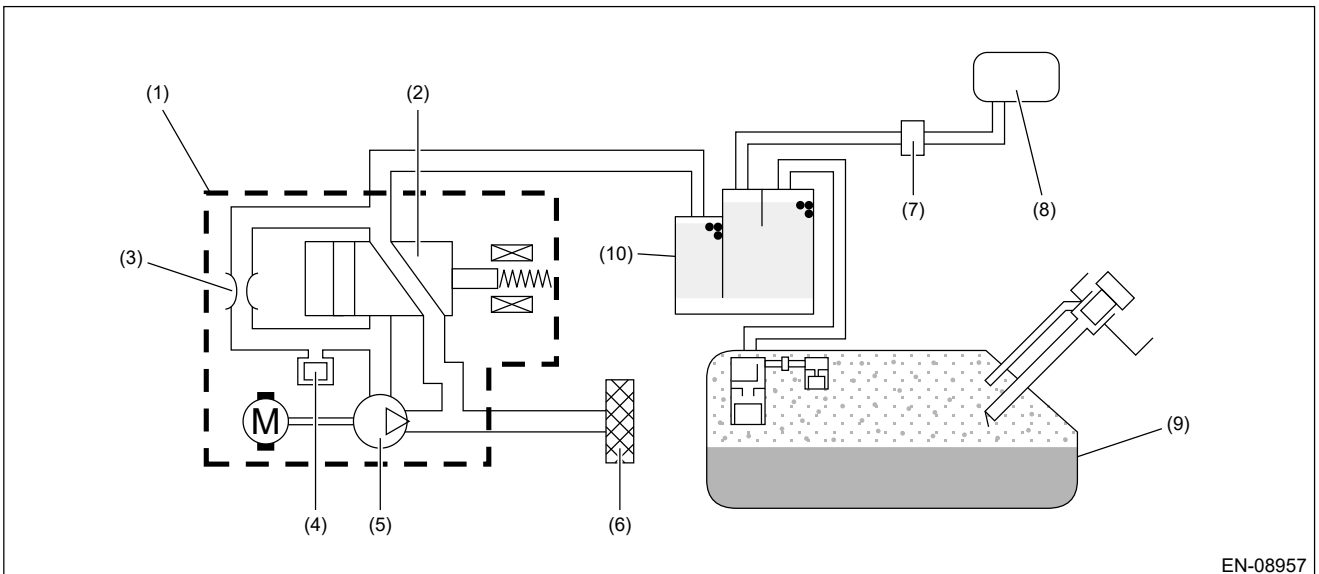
No

Replace the leak check valve assembly. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Leak Check Valve Assembly.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the leak check valve assembly switching valve.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



- (1) Leak check valve ASSY
- (2) Switching valve
- (3) Reference orifice (0.02 inch orifice)
- (4) Pressure sensor
- (5) Vacuum pump
- (6) Drain filter
- (7) Purge control solenoid valve
- (8) Intake manifold
- (9) Fuel tank
- (10) Canister

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9
Evaporative Leak Check Module switching valve drive signal	OFF

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	\leq Battery voltage $\times 0.34$ V

Time needed for diagnosis: 2500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2420 EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT HIGH

DTC detecting condition:

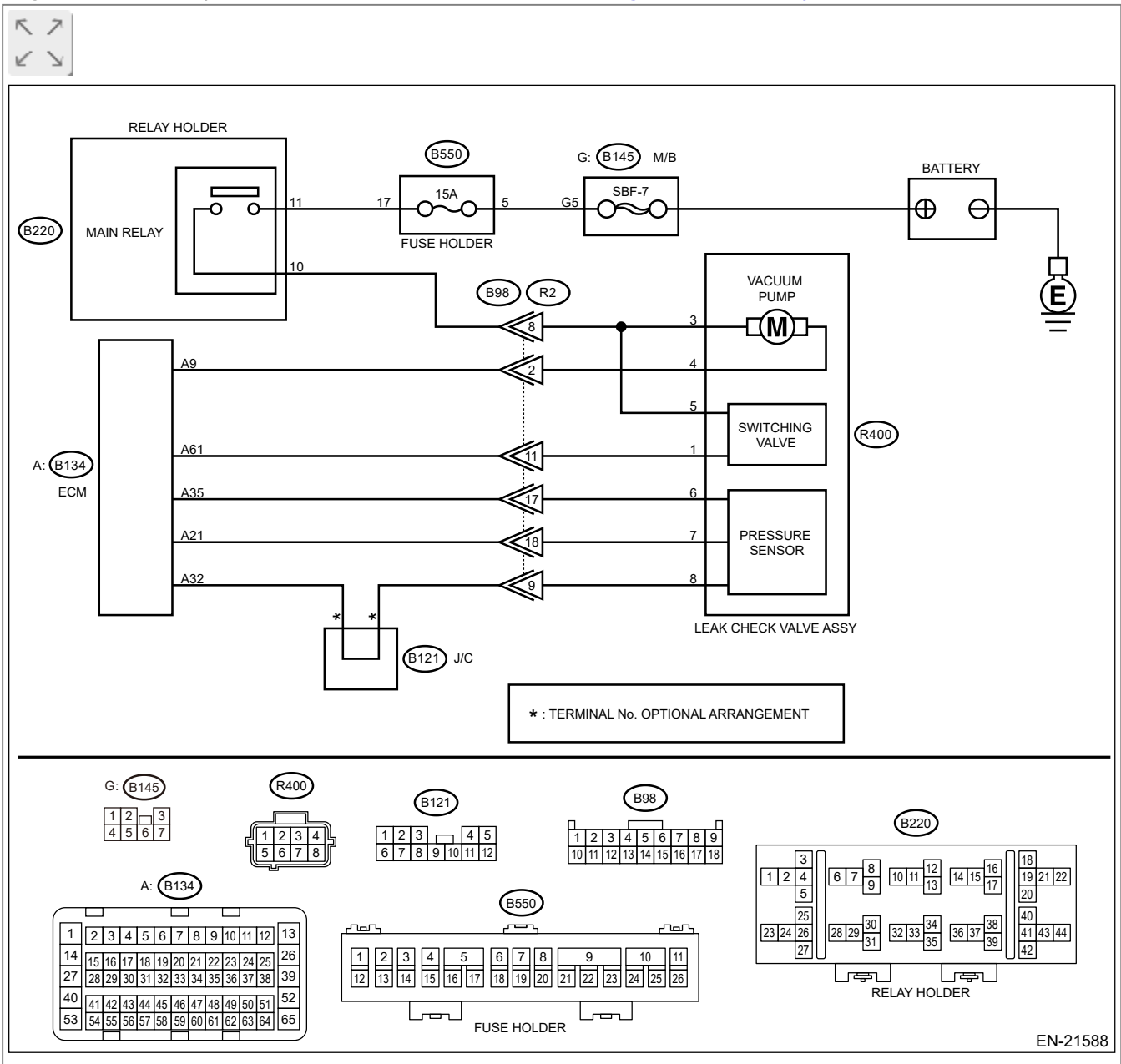
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the leak check valve assembly.
3. Turn the ignition switch to ON.
4. Measure the voltage between leak check valve assembly and chassis ground.

Connector & terminal

(R400) No. 1 (+) – Chassis ground (-):

Is the voltage 10 V or more?

Yes


Repair the short circuit to power in harness between ECM connector and leak check valve assembly connector.

No

 [Go to 2.](#)

2. CHECK LEAK CHECK VALVE ASSEMBLY.




1. Turn the ignition switch to OFF.
2. Check the switching valve of the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Leak Check Valve Assembly>INSPECTION > CHECK SWITCHING VALVE.](#)

Is the switching valve of the leak check valve assembly OK?

Yes

Repair the poor contact in the leak check valve assembly connector.

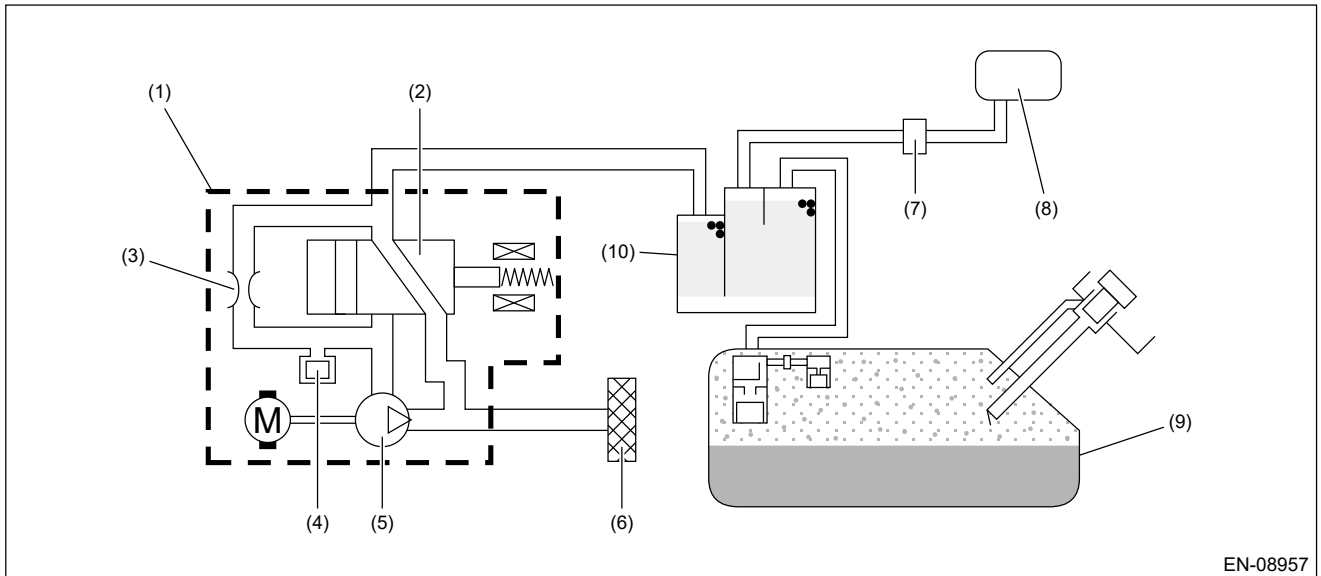
No

Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DO\)>Leak Check Valve Assembly.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the leak check valve assembly switching valve.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-08957

- (1) Leak check valve ASSY
- (2) Switching valve
- (3) Reference orifice (0.02 inch orifice)
- (4) Pressure sensor
- (5) Vacuum pump
- (6) Drain filter
- (7) Purge control solenoid valve
- (8) Intake manifold
- (9) Fuel tank
- (10) Canister

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9
Evaporative Leak Check Module switching valve drive signal	ON

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$\geq 12A$

Time needed for diagnosis: 2500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2530 IGNITION SWITCH RUN POSITION CIRCUIT



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

Improper idling

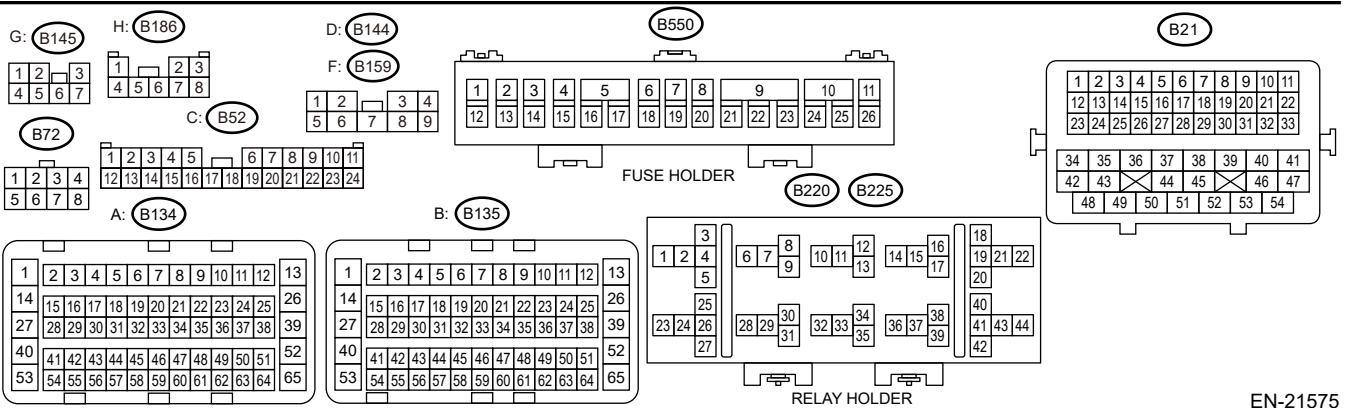
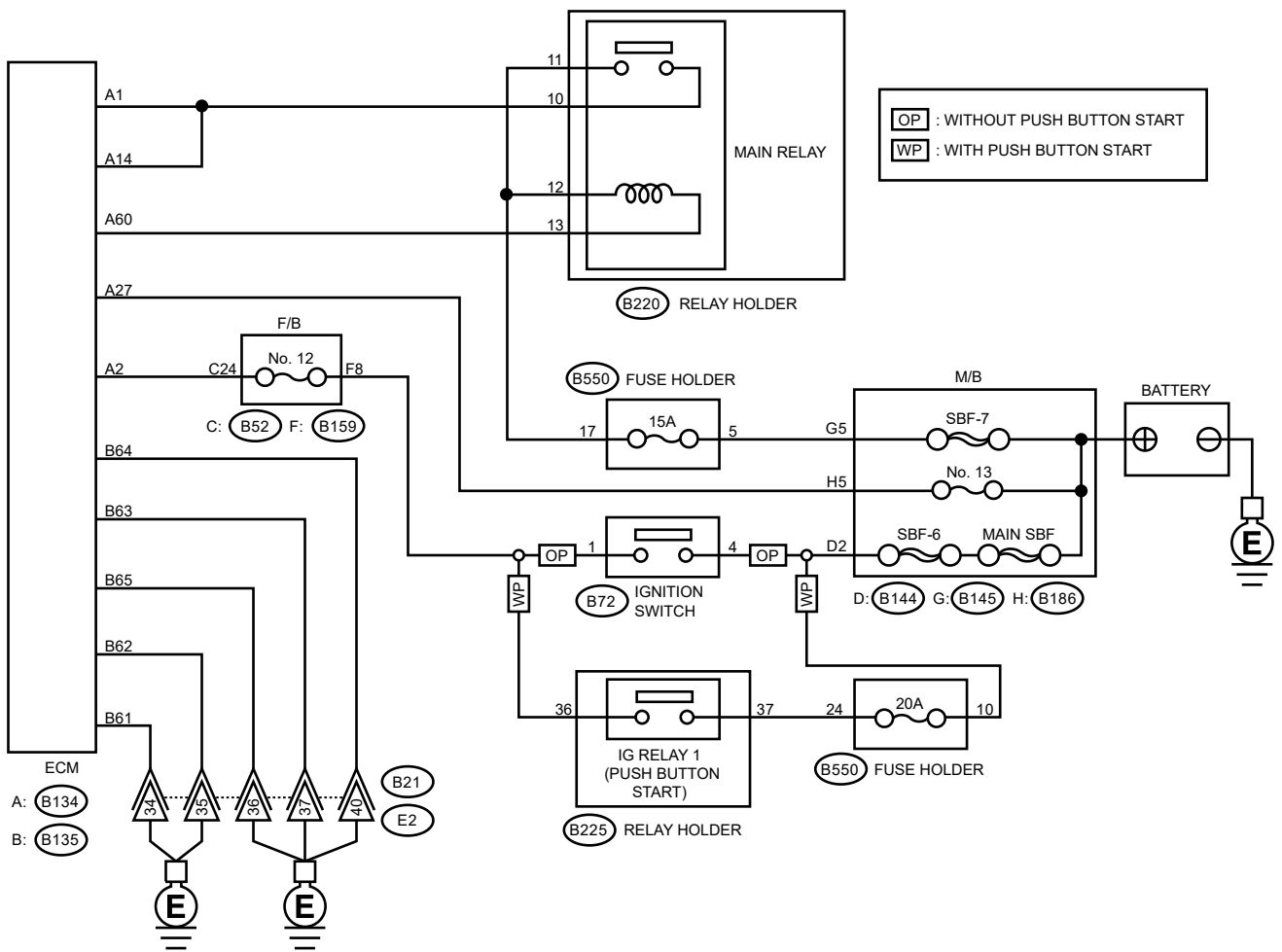
Caution:

- After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#) and Inspection Mode  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode..](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





EN-21575

1. CHECK ECM CONNECTOR.

Check the connecting condition of ECM connector.

Is the ECM connector correctly connected?



Go to 2.



Yes

No

Connect the ECM connector correctly.

2. CHECK INPUT VOLTAGE OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and engine ground while wiggling the harness between ECM connector and ignition switch connector (for models without push button start), or between ECM connector and IG relay 1 (push button start) connector (for models with push button start).

Connector & terminal

(B134) No. 2 (+) — Engine ground (–):

Is the voltage 8 V or more all the time?

Yes

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, the following items may be the cause of fault.

Model without push button start

- Open circuit or short circuit to ground in harness between ECM connector and ignition switch connector
- Poor contact of ignition switch connector
- Poor contact of ignition switch

Model with push button start

- Open circuit or short circuit to ground in harness between ECM connector and IG relay 1 (push button start) connector
- Poor contact in IG relay 1 (push button start) connector
- Poor contact in IG relay 1 (push button start)

No

repair the harness and connector.

Note:

In this case, repair the following item:

Model without push button start

- Open circuit or short circuit to ground in harness between ECM connector and ignition switch connector
- Poor contact of ignition switch connector
- Poor contact of ignition switch
- Faulty fuse (F/B No. 12)

Model with push button start

- Open circuit or short circuit to ground in harness between ECM connector and IG relay 1 (push button start) connector
- Poor contact in IG relay 1 (push button start) connector
- Poor contact in IG relay 1 (push button start)

- Faulty fuse (F/B No. 12)

1. OUTLINE OF DIAGNOSIS

Detect instantaneous open in ignition switch input circuit to ECM.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION

ECM monitors the voltage of the ignition switch input circuit. Judge as ignition switch ON when the voltage is the specified value or more.

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9V
Engine speed	≥ 500rpm

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established within the predetermined time.

Judgment value

Malfunction Criteria	Threshold Value
Number of instantaneous opens in ignition switch input circuit	≥ 5time(s)

Time needed for diagnosis: 5000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P2610 ECM/PCM ENGINE OFF TIMER PERFORMANCE

DTC detecting condition:


Detected when two consecutive driving cycles with fault occur.


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE..

1. CHECK FOR ANY OTHER DTC ON DISPLAY. 

Is any other DTC displayed?

Yes Check DTC using "List of Diagnostic Trouble Code (DTC)".  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>List of Diagnostic Trouble Code (DTC).

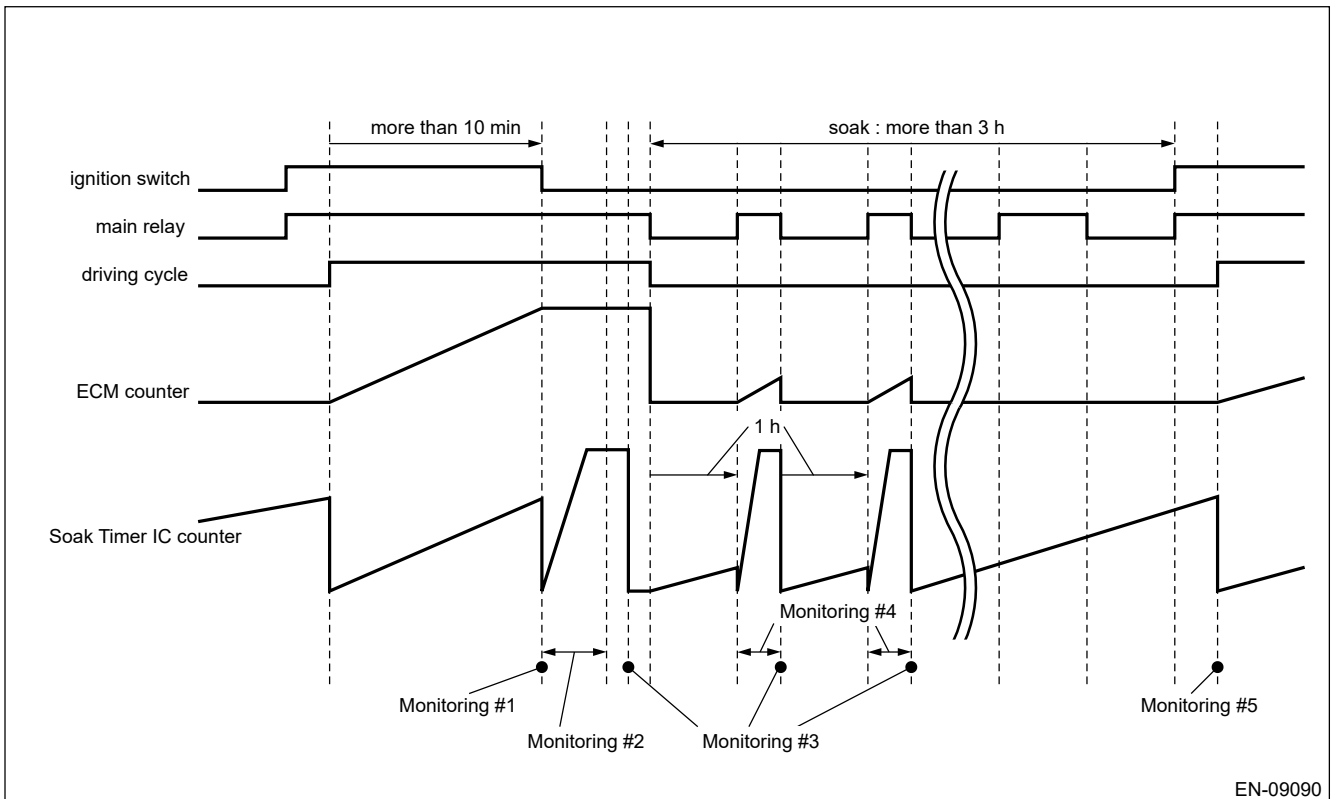
No Replace the ECM.  Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

Note:
The soak timer IC is built into the ECM.

1. OUTLINE OF DIAGNOSIS

Detect malfunction of soaking timer IC by the five diagnoses below.

Monitor Number	Explanation	Time required for diagnosis
Monitor #1 <Timer diagnosis>	Perform diagnosis of the soaking timer IC accuracy	196 ms
Monitor #2 <Full count diagnosis>	Perform diagnosis of the soaking timer IC counter function	4000 ms
Monitor #3 <Soaking timer IC setting diagnosis>	Perform diagnosis of communication between ECM and soaking timer IC	196 ms
Monitor #4 <Timer diagnosis (during soaking)>	Perform diagnosis of the soaking timer IC accuracy during soaking	3000 ms
Monitor #5 <Wake-up diagnosis>	Perform diagnosis of wake-up function	64 ms



EN-09090

2. COMPONENT DESCRIPTION

The soak timer IC is built into the ECM.

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
<Timer diagnosis>	
Battery voltage	$\geq 10.9 \text{ V}$
Ignition switch	OFF
Elapsed time after starting the engine	$> 600 \text{ s}$ and $< 61380 \text{ s}$
<Full count diagnosis>	
Battery voltage	$\geq 10.9 \text{ V}$
Ignition switch	OFF
Counter in ECM	$\geq 4 \text{ s}$
<Soaking timer IC setting diagnosis>	
Battery voltage	$\geq 10.9 \text{ V}$
Ignition switch	OFF
<Timer diagnosis (during soaking)>	
Battery voltage	$\geq 10.9 \text{ V}$
Ignition switch	OFF
<Wake-up diagnosis>	

Ignition switch	ON
Time in the soaking timer IC	> 3600s

4. GENERAL DRIVING CYCLE

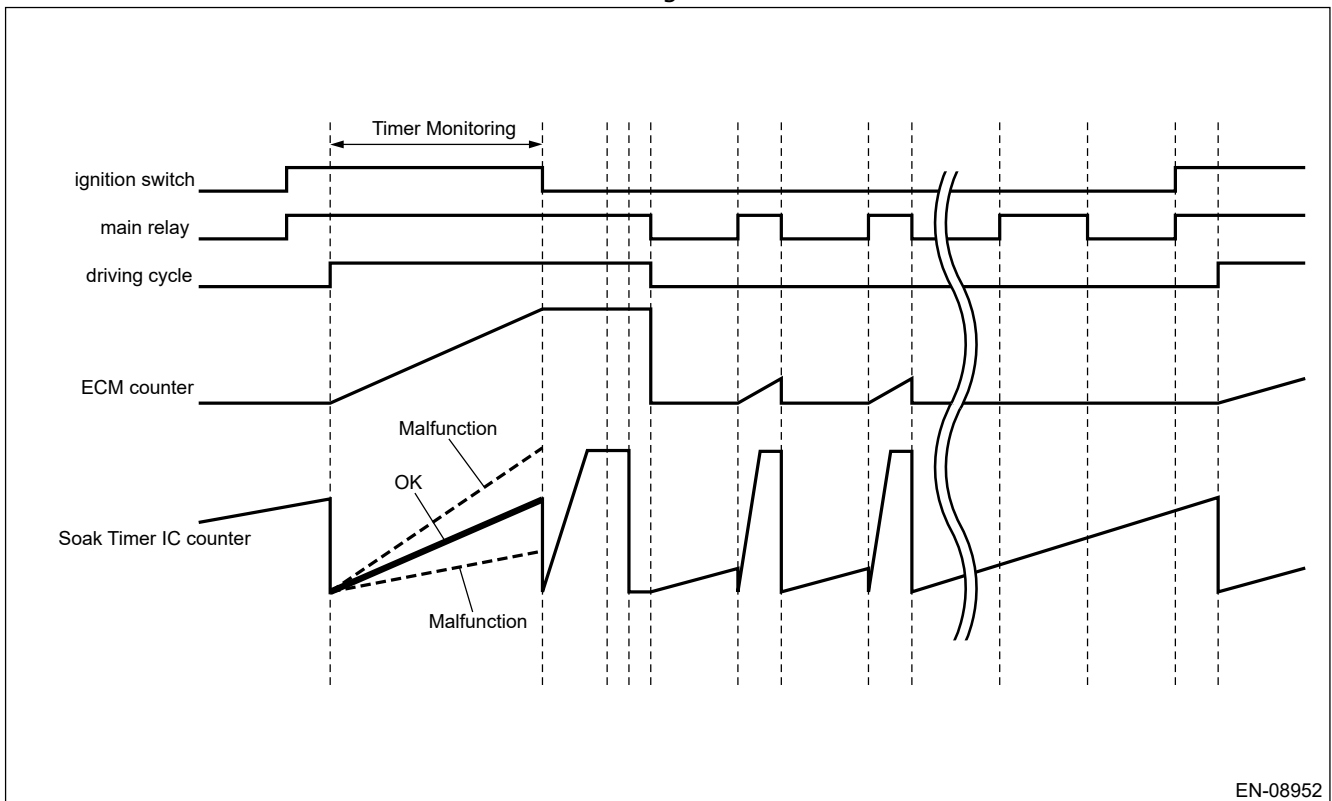
Perform the diagnosis only once when the ignition switch is OFF and when the ignition switch is ON after the soaking of one hour or more.

5. DIAGNOSTIC METHOD

<TIMER DIAGNOSIS>

Start the count up operation of counters in ECM and in soaking timer IC when the engine is started.

Judge as timer malfunction if the difference between the counter in ECM and counter in soaking timer IC exceeds the allowable limit when the ignition switch is OFF.



EN-08952

Judge as NG when the following conditions are established.

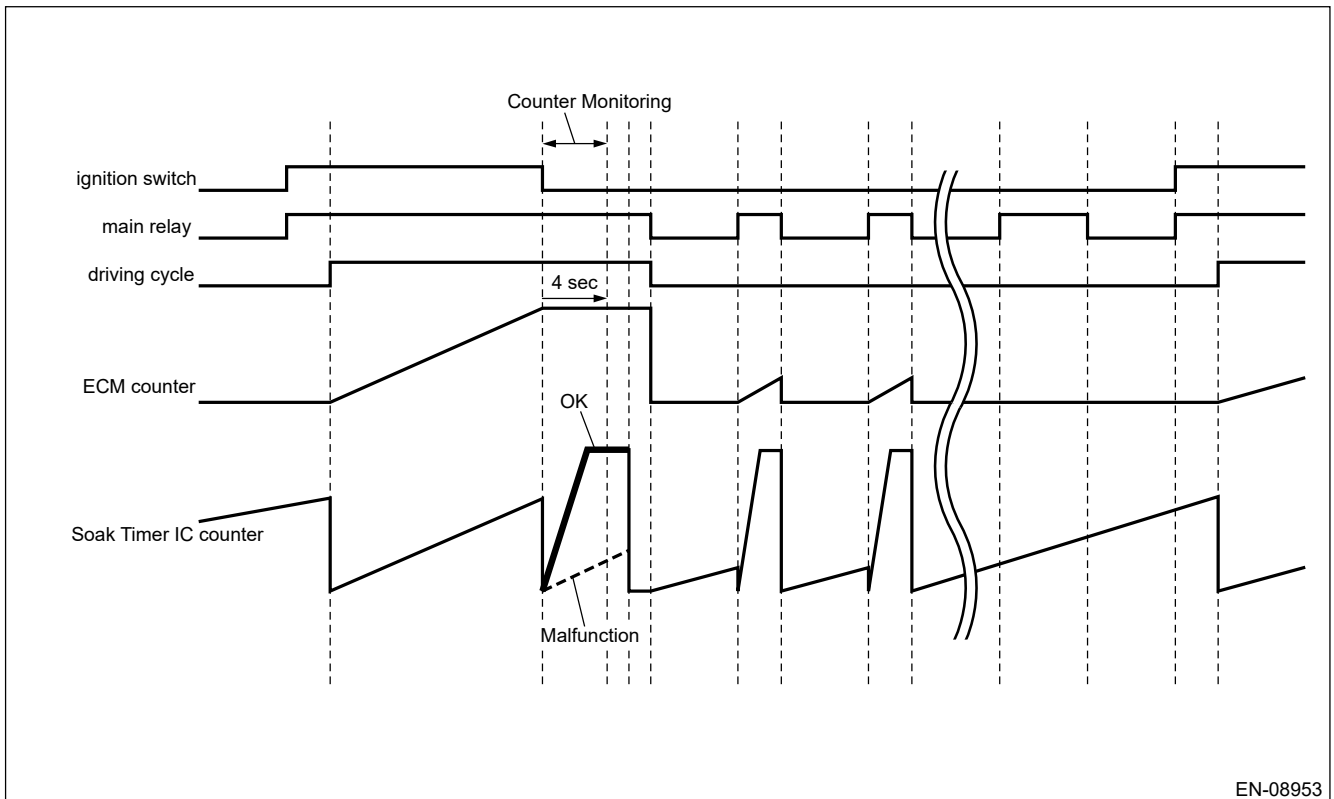
Judgment value

Malfunction Criteria	Threshold Value
$\frac{ \text{osoaktimcpu} - \text{osoaktimic} }{\text{osoaktimcpu}}$ osoaktimcpu = Counter in ECM osoaktimic = Counter in soaking timer IC	> 0.24

<FULL COUNT DIAGNOSIS>

Reset the counter in soaking timer IC and start the count up operation.

Judge as full count diagnosis malfunction if counter in soaking timer IC is not \$3FF (1023 count) after 4 seconds.



EN-08953

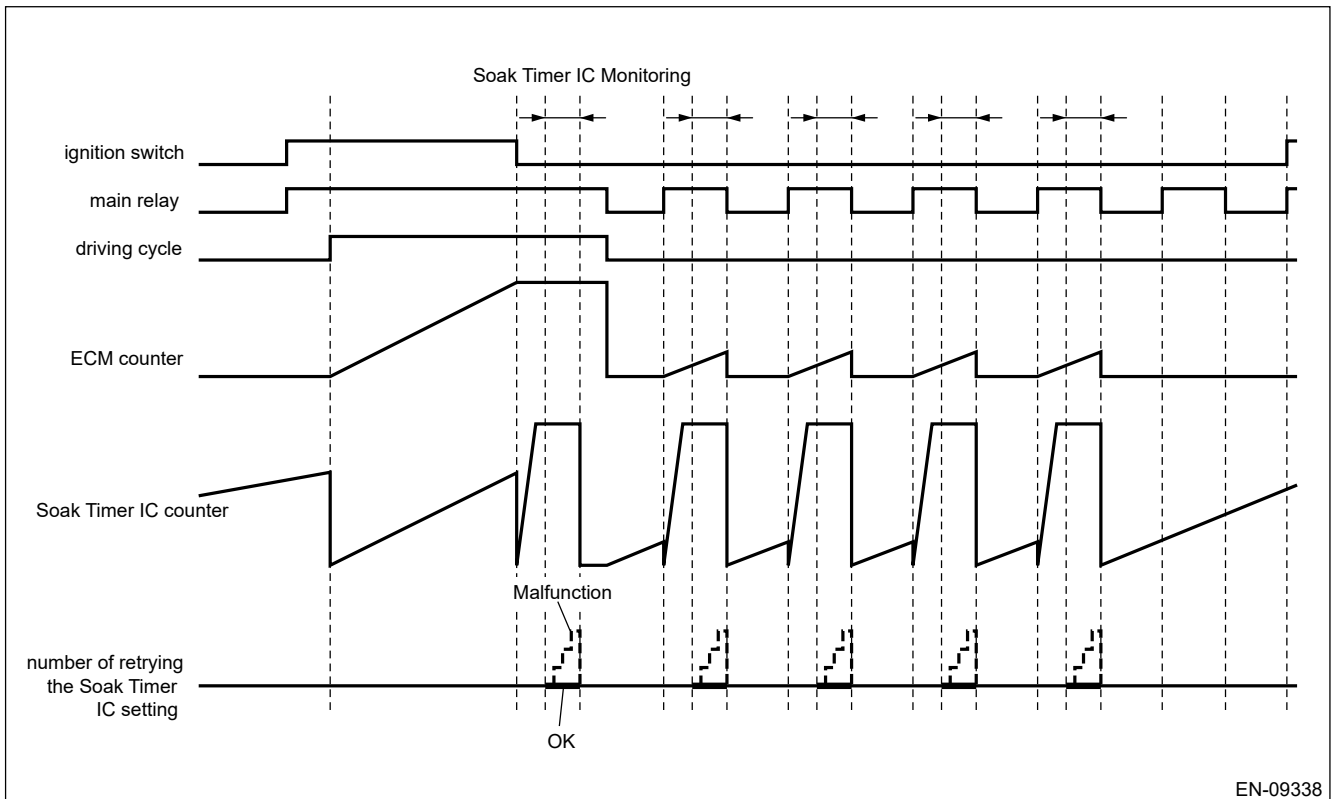
Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
osoakfcntic osoakfcntic = Counter in soaking timer IC	≠\$3FF (1023 count)

<SOAKING TIMER IC SETTING DIAGNOSIS>

When setting the activation setting time to soaking timer IC, compare the writing value to soaking timer IC with read out value. Judge as malfunction if the values do not match 3 times in a row.



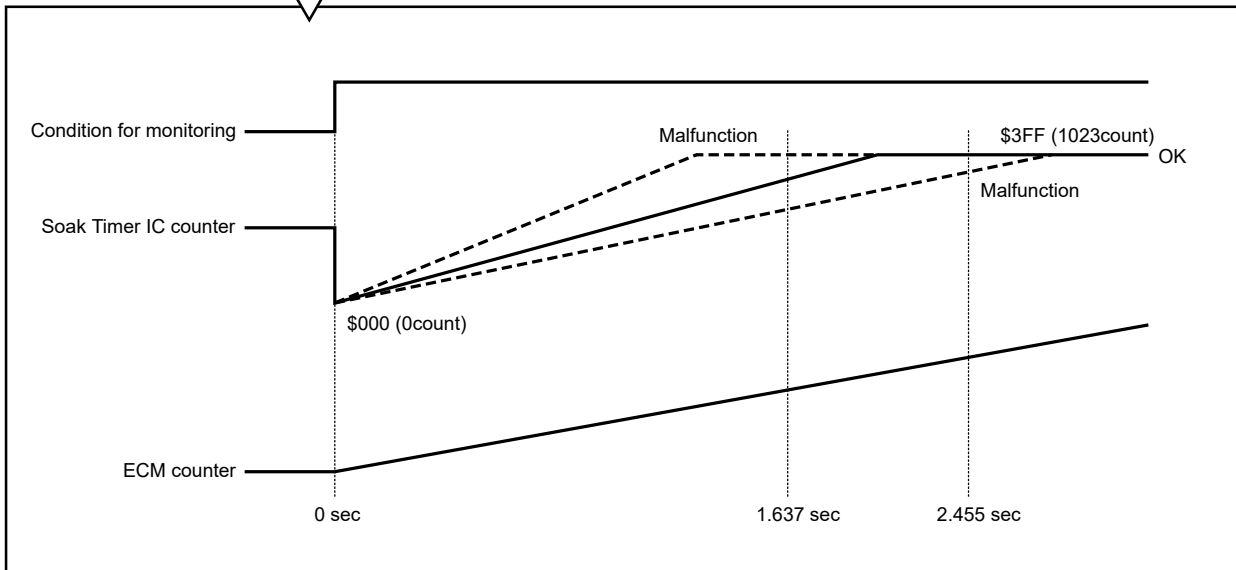
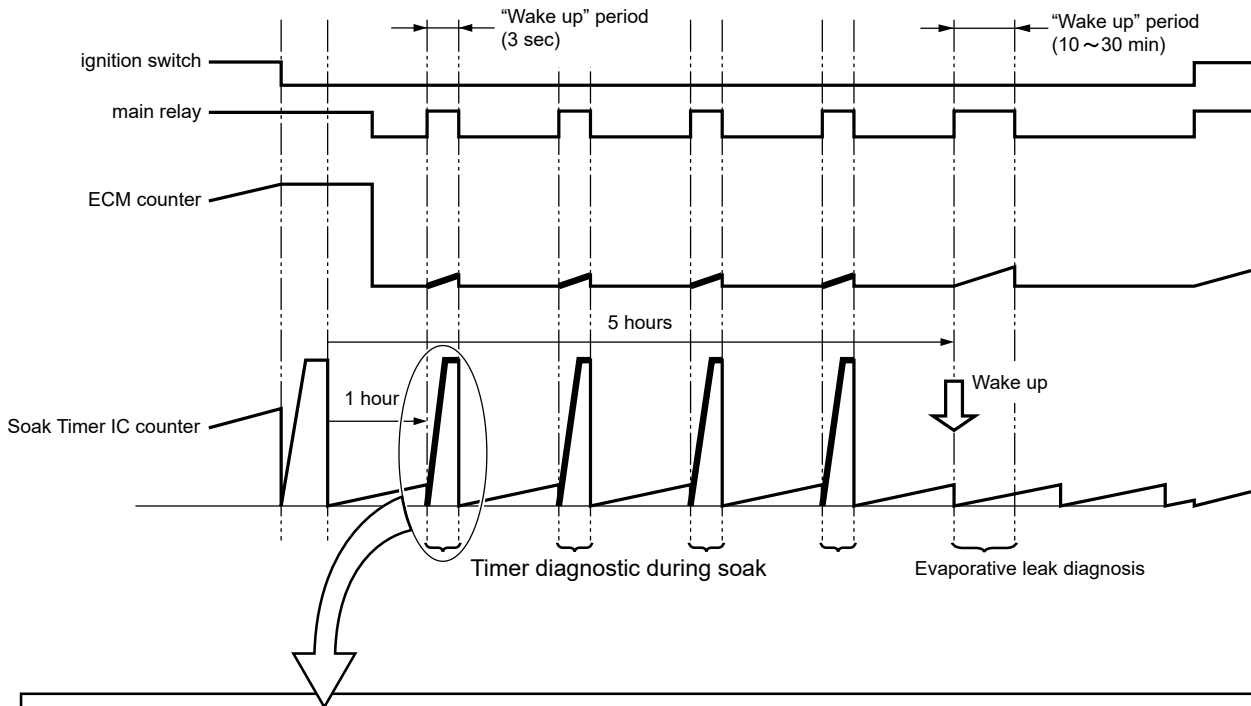
Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Writing value and read out value when setting the soaking timer	Unmatch

<TIMER DIAGNOSIS (DURING SOAKING)>

Wake-up at the predetermined interval until 5, 7 or 9.5 hours have passed after the ignition switch is OFF, and compare the counter in soaking timer IC with the counter in ECM.
 Judge as malfunction if the counter in soaking timer IC is counted up to maximum value (1023 count) when the counter in ECM is 1637 ms, or if the counter in soaking timer IC is not counted up to maximum value (1023 count) when the counter in ECM is 2455 ms.



EN-08981

Judge as NG when the following conditions are established.

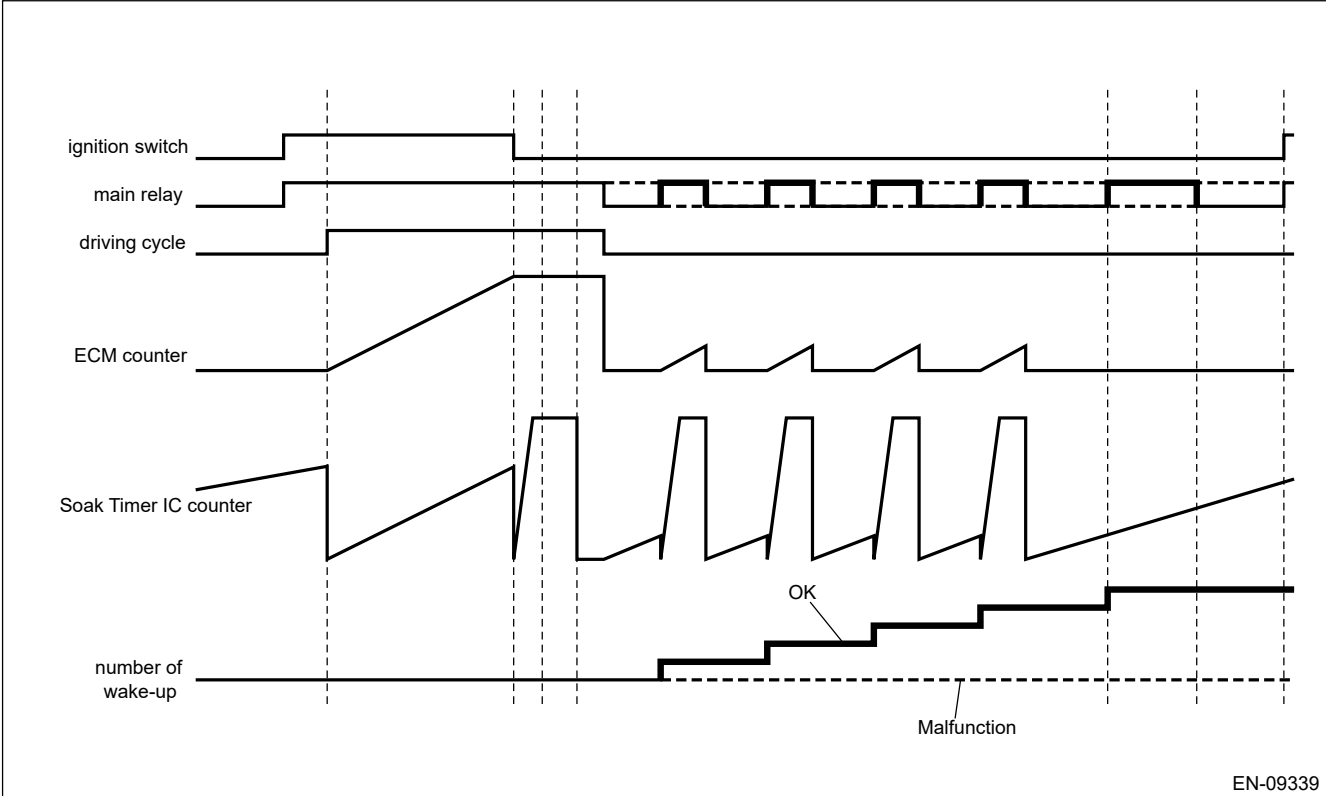
Judgment value

Malfunction Criteria	Threshold Value
When any one of the followings is established:	
• All of the following conditions are established.	
Counter in ECM	≤ 1636 ms
Counter in soaking timer IC	$= \$3FF$ (1023 count)

<ul style="list-style-type: none"> All of the following conditions are established. 	
Counter in ECM	≥ 2456 ms
Counter in soaking timer IC	$\neq \$3FF$ (1023 count)

<WAKE-UP DIAGNOSIS>

Store the number of wake-up activation when the ECM wakes up by the soaking timer IC. Next time when the ignition switch is ON, if the number of wake-up does not reach the predetermined value even though the counter in soaking timer IC operates 1 hour or more, judge as wake-up malfunction.



EN-09339

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Number of wake-up	< Wake-up indication count

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Ignition switch	ON
Driving cycle	Completed
When any one of the followings is established:	
• Timer diagnosis	NG

• Full count diagnosis	NG
• Soaking timer IC setting diagnosis	NG
• Timer diagnosis (during soaking)	NG
• Wake-up diagnosis	NG

Time Needed for Diagnosis: Approx. 5 — 9.5 hours

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS "A" OFF

Note:

For the diagnostic procedure, refer to LAN section.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS

Detect malfunction of CAN communication.
Judge as NG when CAN communication failure has occurred.

2. COMPONENT DESCRIPTION

(Common Specifications)

- CAN Protocol 2.0 B (Active)
- Frame Format: 11 Bit ID Frame (Standard Frame)
- Conforms to ISO11898
- Communication Speed: 500 kbps

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	> 10.9V

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after starting the engine.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
CAN bus condition	Bus off

Time needed for diagnosis: 436ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0077 LIN COMMUNICATION BUS "ECM/PCM" OFF

DTC detecting condition:

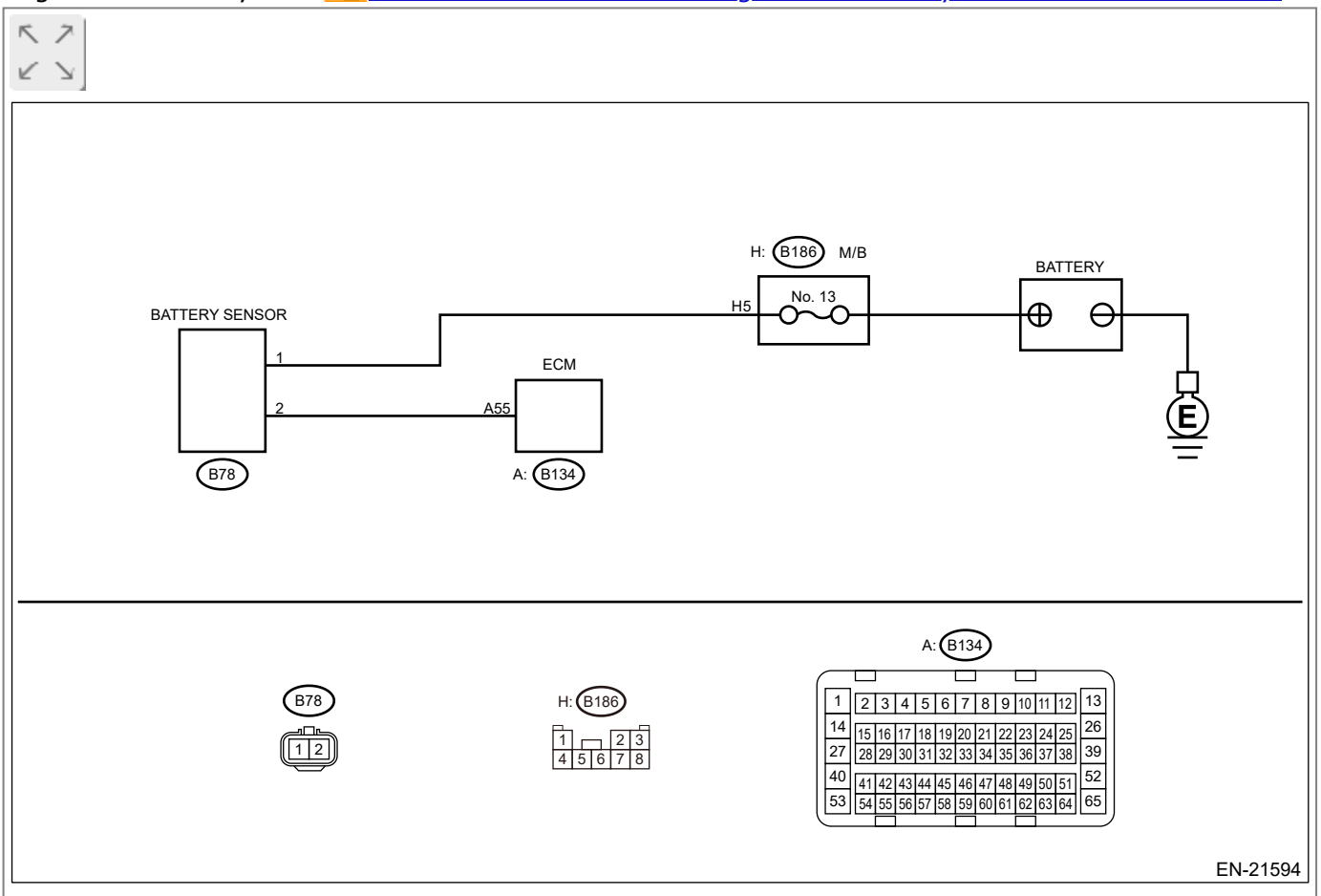
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:


Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DTC.

Check for DTC.

Note:

- Subaru Select Monitor
Refer to "Read Diagnostic Trouble Code (DTC)" for detailed operation procedure.  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Read Diagnostic


Trouble Code (DTC).

- **General scan tool**

For detailed operation procedures, refer to the general scan tool operation manual.

Is U0077 displayed in [DTC]?

Yes


 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. Clear the memory using the Subaru Select Monitor or general scan tool.

Note:

- **Subaru Select Monitor**

For detailed procedures, refer to "Clear memory".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)

- **General scan tool**

For detailed operation procedures, refer to the general scan tool operation manual.

2. CHECK BETWEEN ECM CONNECTOR AND BATTERY SENSOR CONNECTOR, AND BETWEEN ECM CONNECTOR AND ACTIVE GRILLE SHUTTER CONNECTOR.



- 1.** Turn the ignition switch to OFF.
- 2.** Disconnect the active grille shutter connector.
- 3.** Disconnect the battery sensor connector.
- 4.** Disconnect the ECM connector.
- 5.** Measure the resistance of terminals between ECM connector and battery sensor connector, as well as ECM connector and active grille shutter connector.

Connector & terminal

(B134) No. 55 — (B78) No. 2:

(B134) No. 55 — (B63) No. 3:

Is the resistance less than 1 Ω?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and battery sensor connector, and between ECM connector and active grille shutter connector**

- **Poor contact of coupling connector**

3. CHECK WIRING HARNESS BETWEEN ECM CONNECTOR AND BATTERY SENSOR CONNECTOR, AND BETWEEN ECM CONNECTOR AND ACTIVE GRILLE SHUTTER CONNECTOR.


Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 55 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair the short circuit to ground in harness between ECM connector and battery sensor connector, as well as ECM connector and active grille shutter connector.

4. CHECK WIRING HARNESS BETWEEN ECM CONNECTOR AND BATTERY SENSOR CONNECTOR, AND BETWEEN ECM CONNECTOR AND ACTIVE GRILLE SHUTTER CONNECTOR.


1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B134) No. 55 — Chassis ground:

Is the voltage less than 1 V?


Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM connector and battery sensor connector, as well as ECM connector and active grille shutter connector.

5. CHECK DTC.


1. Turn the ignition switch to OFF.
2. Connect the battery sensor connector.
3. Connect the ECM connector.
4. Clear the memory using the Subaru Select Monitor or general scan tool.  [Ref. to](#)

[ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)

5. Check for DTC.

Note:

- **Subaru Select Monitor**


Refer to "Read Diagnostic Trouble Code (DTC)" for detailed operation procedure.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)

- **General scan tool**

For detailed operation procedures, refer to the general scan tool operation manual.

Is U0077 displayed in [DTC]?

Yes

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#)


No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause. Clear the memory using the Subaru Select Monitor or general scan tool.

- Subaru Select Monitor

For detailed procedures, refer to "Clear memory".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)

- General scan tool

For detailed operation procedures, refer to the general scan tool operation manual.

1. OUTLINE OF DIAGNOSIS

Detect malfunction of LIN communication.

Judge as NG when the data sent/received via LIN communication is abnormal.

2. COMPONENT DESCRIPTION

LIN communication is used to send/receive data between ECM, battery sensor and active grille shutter.

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Data sent/received with control modules connected to LIN	No change or Checksum error

Time needed for diagnosis: 1280 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM

Note:

For the diagnostic procedure, refer to LAN section.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS

Detect malfunction of CAN communication.

Judge as NG when CAN communication failure has occurred between TCM, VDC CM and body integrated unit.

2. COMPONENT DESCRIPTION

(Common Specifications)

CAN Protocol 2.0 B (Active)

Frame Format: 11 Bit ID Frame (Standard Frame)

Conforms to ISO11898

Communication Speed: 500 kbps

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9V

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after starting the engine.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
ID received from control module connected to CAN	None

Time needed for diagnosis: 500 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

Note:

For the diagnostic procedure, refer to LAN section.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC U0101.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC U0101 LOST COMMUNICATION WITH TCM.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

Note:

For the diagnostic procedure, refer to LAN section.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC U0101.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC U0101 LOST COMMUNICATION WITH TCM.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0402 INVALID DATA RECEIVED FROM TCM

Note:

For the diagnostic procedure, refer to LAN section.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS

Detect malfunction of CAN communication.

Judge as NG when data received from TCM, VDC CM and body integrated unit is not normal.

2. COMPONENT DESCRIPTION

(Common Specifications)

CAN Protocol 2.0 B (Active)

Frame Format: 11 Bit ID Frame (Standard Frame)

Conforms to ISO11898

Communication Speed: 500 kbps

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9V

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after starting the engine.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Data updated from control module connected to CAN	None

Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

Note:

For the diagnostic procedure, refer to LAN section.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC U0402.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC U0402 INVALID DATA RECEIVED FROM TCM.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE

Note:

For the diagnostic procedure, refer to LAN section.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC U0402.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC U0402 INVALID DATA RECEIVED FROM TCM.](#)



ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1712 LOST LIN COMMUNICATION WITH BATTERY "1" MONITOR MODULE

DTC detecting condition:

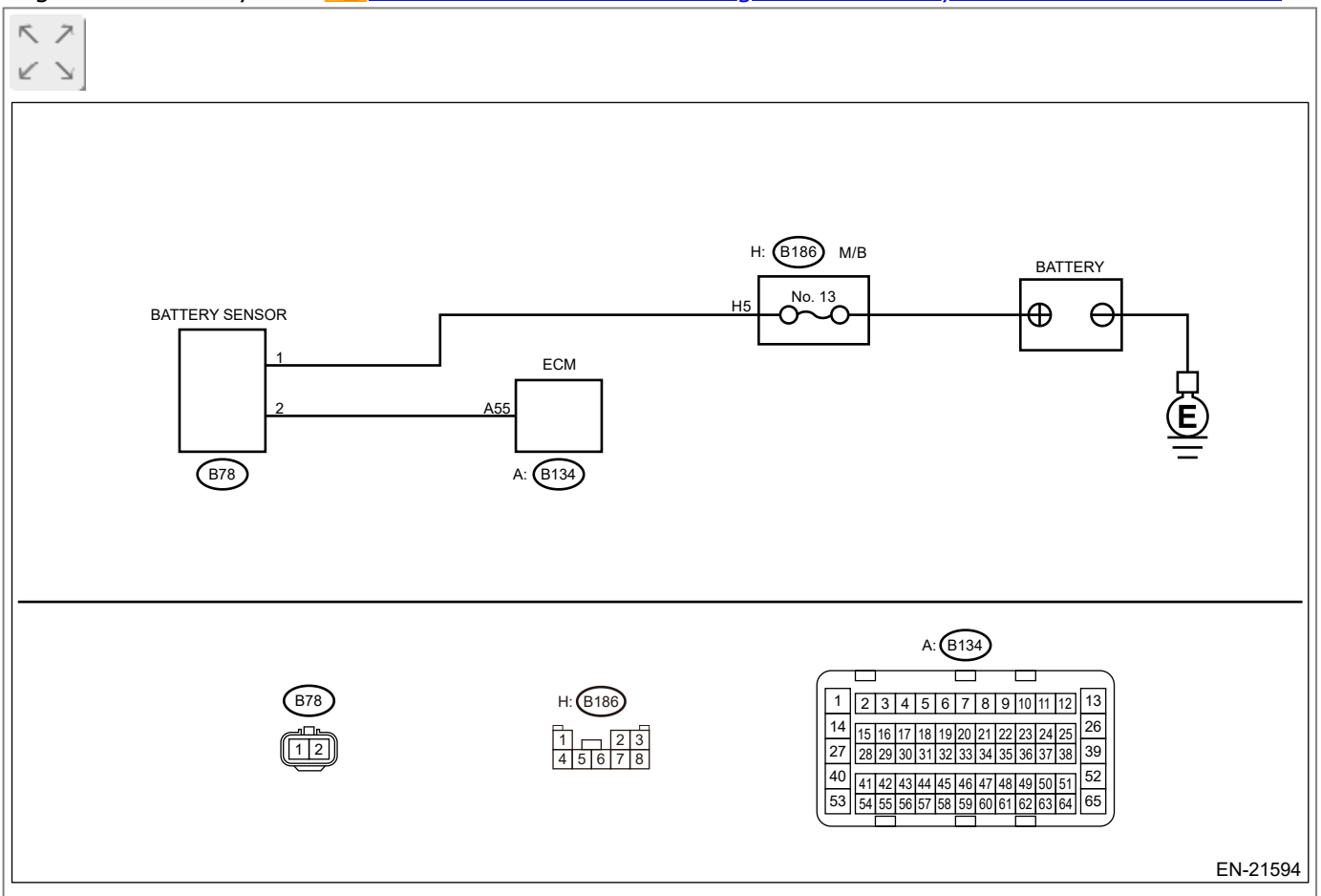
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.


Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



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1. CHECK DTC.

Check for DTC.  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is U1712 displayed in [DTC]?



Yes

 [Go to 2.](#)

No

The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

2. CHECK ECM CONNECTOR.

Check the connecting condition of ECM connector.

Is the ECM connector correctly connected?



Yes

 [Go to 3.](#)

No

Connect the ECM connector correctly.

3. CHECK HARNESS BETWEEN BATTERY AND BATTERY SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the ground terminal from battery sensor.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery>REMOVAL.](#)  [Ref. to NOTE>BASIC REPAIR HINT > WHEN REMOVING BATTERY.](#)
3. Disconnect the connector from battery sensor.
4. Disconnect the positive terminal of battery.
5. Measure the resistance of the harness between battery positive cable terminal and battery sensor connector.

Connector & terminal

Positive cable terminal — (B78) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Repair the open circuit in harness between battery positive cable terminal and battery sensor connector.

4. CHECK HARNESS BETWEEN ECM AND BATTERY SENSOR CONNECTOR.

1. Disconnect the connector from ECM.

2. Measure the resistance of harness between battery positive terminal and battery sensor connector.

Connector & terminal

(B78) No. 1 — Battery positive terminal:

Is the resistance less than 1 Ω?

Yes

Repair the poor contact of ECM connector or battery sensor connector.

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and battery sensor connector**
- **Poor contact of coupling connector**

1. OUTLINE OF DIAGNOSIS

Detect malfunction of LIN communication.

Judge as NG when LIN communication failure has occurred with the battery sensor.

2. COMPONENT DESCRIPTION

(Common Specifications)

Communication protocol: LIN 2.0

Communication speed: 19.20 kbps

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Data received from control modules connected to LIN	No change or Checksum error

Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Does not illuminate.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U171F LOST LIN COMMUNICATION WITH GENERATOR

DTC detecting condition:

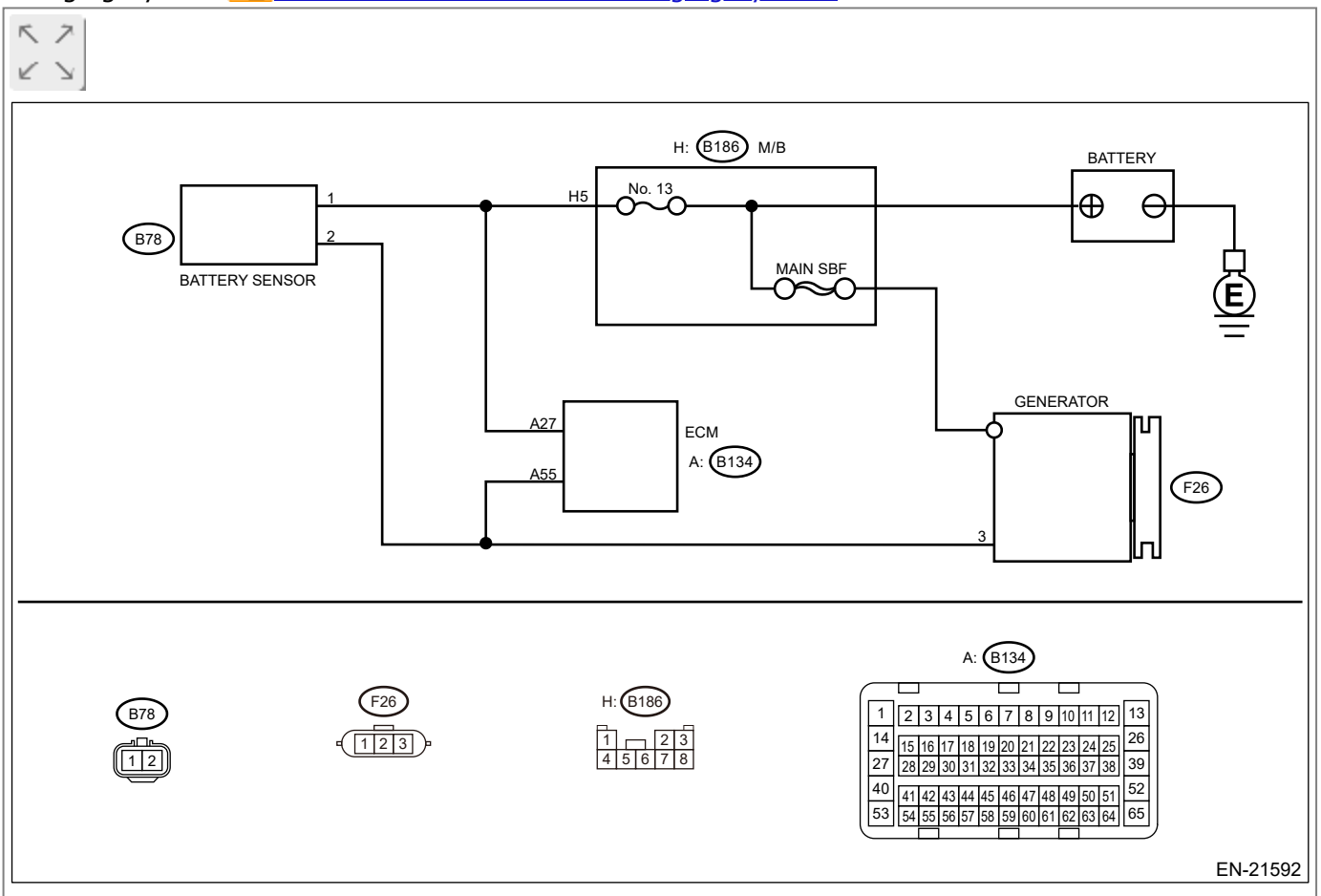
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform **Clear Memory** [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) and **Inspection Mode** [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Charging System [Ref. to WIRING SYSTEM>Charging System.](#)




1. CHECK DTC.

Check for DTC. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is U171F displayed in [DTC]?



Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

2. CHECK ECM CONNECTOR.

Check the connecting condition of ECM connector.

Is the ECM connector correctly connected?


Yes

 [Go to 3.](#)

No

Connect the ECM connector correctly.

3. CHECK VOLTAGE OF GENERATOR B TERMINAL.

1. Turn the ignition switch to OFF.
2. Disconnect the ground terminal from battery sensor.  [Ref. to NOTE>NOTE > BATTERY.](#)
3. Measure the voltage of the generator B terminal.

Connector & terminal

Generator B terminal — Engine ground:

Is it battery voltage?

Yes

 [Go to 4.](#)

No

Check the generator B terminal harness and fuse.

4. CHECK HARNESS BETWEEN ECM AND GENERATOR CONNECTOR.


1. Disconnect the connector from ECM.
2. Disconnect the LIN communication connector from the generator.
3. Measure the resistance of harness between ECM and generator LIN communication connector.

Connector & terminal

(B134) No. 23 — (F26) No. 3:

Is the resistance less than 1 Ω ?

Yes

Check the connector for poor contact and check the harness again. If no fault is found, replace the generator.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Generator.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and generator**
- **Poor contact of coupling connector**

1. OUTLINE OF DIAGNOSIS

Detect malfunction of LIN communication.

Judge as NG if LIN communication failure has occurred with the generator.

2. COMPONENT DESCRIPTION

LIN communication is a network used for sending/receiving data between the control modules connected by LIN communication system.

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Data received from control modules connected to LIN	No change or Checksum error

Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Does not illuminate.

CHECK BRAKE OVERRIDE SYSTEM

Caution:

Perform this test in a location where the driving can be checked safely, while paying sufficient attention to the vicinity. While driving, the traffic laws and regulations such as speed limit must always be observed.

Note:


- The value of [Accel. Opening Angle] on the data monitor normally changes according to the value of accelerator sensor No. 1 voltage ratio. (The values do not become the same. Refer to ES-41 for the values)
- Even if the voltage difference between [Accel. Opening Angle] and the accelerator sensor No. 1 is large and the value of [Accelerator Pedal Angle] is not consistent, the corresponding control can be considered to be activated if the value of the accelerator sensor No. 1 voltage ratio is consistent. (Use of the data storage function of Subaru Select Monitor 4 allows the data during driving to be stored. The stored data can be checked after the driving.)
- When the customer complains of deceleration feeling when he/she intentionally depresses both the accelerator pedal and the brake pedal, advise them not to depress both pedals. (Example: operating the brake pedal with the left foot while operating the accelerator pedal)

1. CHECK DTC.

Check for DTC.


1. Connect Subaru Select Monitor 4 to data link connector.
2. Turn the ignition switch to ON.
3. Turn the Subaru Select Monitor 4 to ON.
4. Check for the DTCs of the system that may be output.

Note:

- **Subaru Select Monitor**
Refer to "Read Diagnostic Trouble Code (DTC)" for detailed operation procedure.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is there any DTC output?

Yes

Check DTC using "List of Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 2.](#)

2. READ DATA MONITOR.



Using the Subaru Select Monitor, read the value in [Stop Light Switch].

Note:

- For detailed operation procedures, refer to the "Data Monitor". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)

Is the value of [Stop Light Switch] changed to ON/OFF on the data monitor?

Yes

[Go to 3.](#)

No

Check the stop light circuit.

3. CHECK BRAKE PEDAL.



Check the brake pedal.

Is the brake pedal OK?

Yes

[Go to 4.](#)

No

Adjust or replace the brake pedal. [Ref. to BRAKE>Brake Pedal.](#)

4. READ DATA MONITOR.



Using the Subaru Select Monitor, read the values in [Accelerator Pedal Pos.#1] and [Accelerator Pedal Pos.#2] when operating the accelerator pedal from fully closed to fully open.

Note:

- For detailed operation procedures, refer to the "Data Monitor". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)

Does the values of [Accelerator Pedal Pos.#1] and [Accelerator Pedal Pos.#2] continuously change?

Yes

[Go to 5.](#)

No

Replace the throttle opening angle sensor. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Throttle Body.](#)

5. READ DATA MONITOR.

Using Subaru Select Monitor, read the value of [Vehicle Speed] when driving at a constant speed of 16.1 Km/h (10 MPH) or 64.4 Km/h (40 MPH).

Caution:


During the driving test, the traffic laws and regulations such as speed limit must always be observed.

Note:

- **Use of the data storage function of Subaru Select Monitor 4 allows the data during driving to be stored. The stored data can be checked after the driving.**

Does the value of [Vehicle Speed] change widely?

Yes

Check the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System.](#)



No

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostics for Engine Starting Failure

CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM)

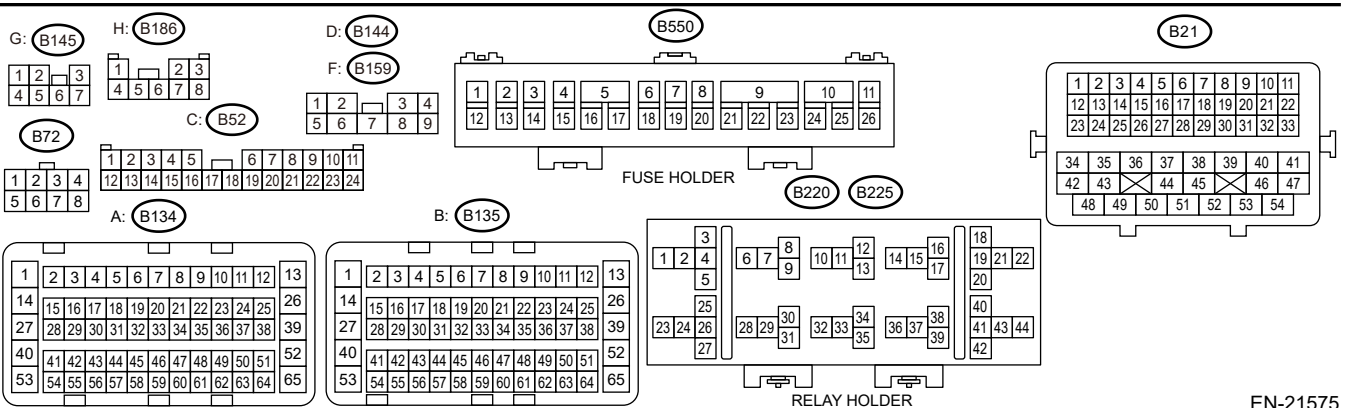
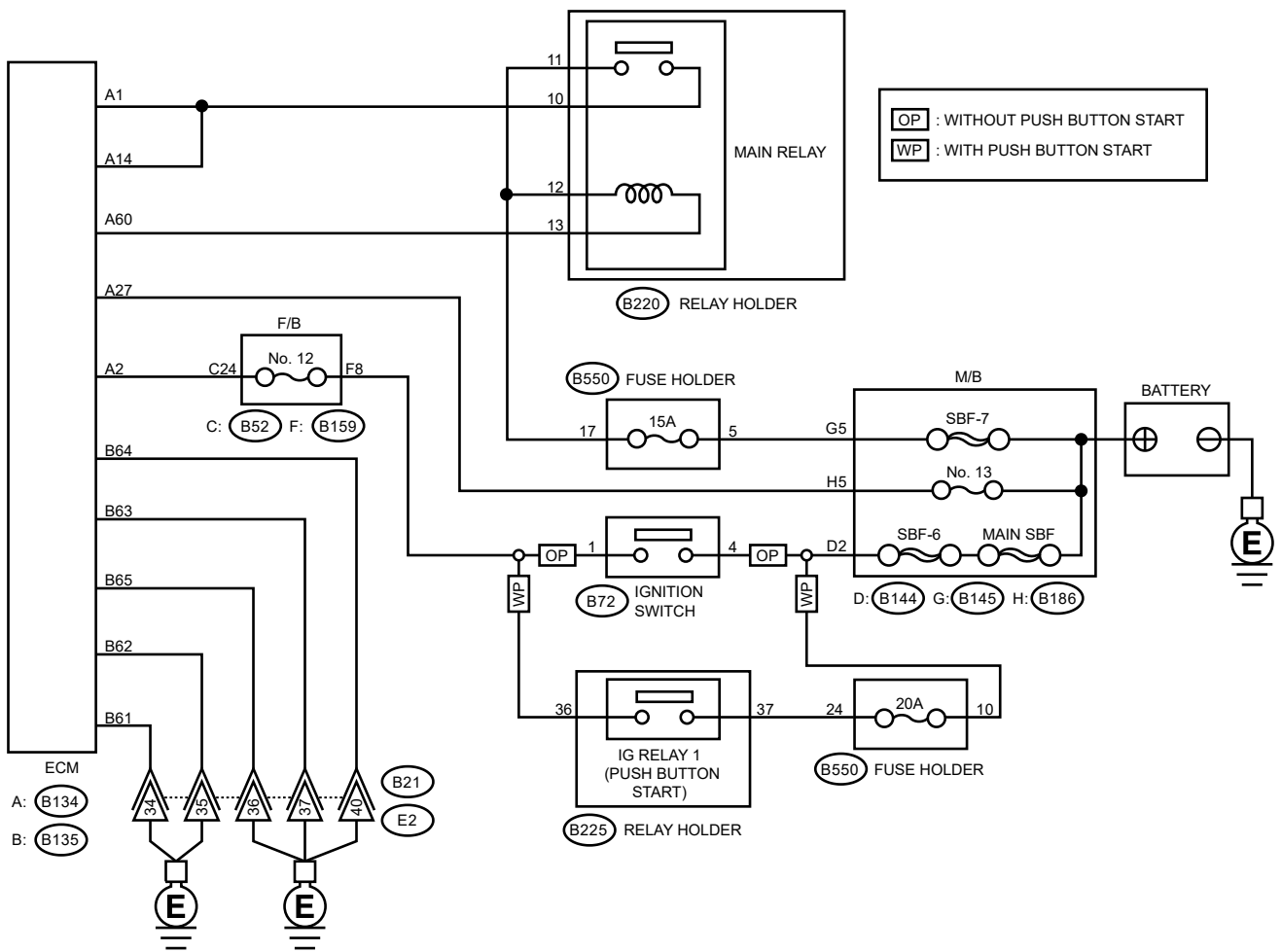
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





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1. CHECK MAIN RELAY.

1. Turn the ignition switch to OFF.
2. Remove the main relay.
3. Connect the battery to main relay terminals No. 12 and No. 13.
4. Measure the resistance between main relay terminals.




Terminals


No. 10 —No. 11:

Is the resistance less than 1 Ω ?

Yes

 [Go to 2.](#)

No

Replace the main relay.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Main Relay.](#)

2. CHECK GROUND CIRCUIT FOR ECM.

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and chassis ground.

Connector & terminal

(B135) No. 61 — Chassis ground:

(B135) No. 62 — Chassis ground:

(B135) No. 63 — Chassis ground:

(B135) No. 64 — Chassis ground:

(B135) No. 65 — Chassis ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and engine ground terminal**
- **Poor contact of coupling connector**

3. CHECK INPUT VOLTAGE OF ECM.


1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B134) No. 2 (+) — Chassis ground (-):

(B134) No. 27 (+) — Chassis ground (-):

Is the voltage 10 V or more?

 [Go to 4.](#)

Yes

No

Repair the open or ground short in the harness of power supply circuit.

4. CHECK INPUT VOLTAGE OF MAIN RELAY.



Measure the voltage between main relay connector and chassis ground.


Connector & terminal

(B220) No. 11 (+) — Chassis ground (-):

(B220) No. 12 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 5.](#)

No

Repair the open or ground short in the harness of power supply circuit.

5. CHECK INPUT VOLTAGE OF ECM.



1. Turn the ignition switch to OFF.
2. Install the main relay.
3. Turn the ignition switch to ON.
4. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B134) No. 60 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 6.](#)

No

Repair the open circuit of harness between ECM connector and main relay connector.

6. CHECK INPUT VOLTAGE OF ECM.



1. Turn the ignition switch to OFF.
2. Connect the connector to ECM.
3. Turn the ignition switch to ON.
4. Measure the voltage between ECM connector and chassis ground.


Connector & terminal

(B134) No. 1 (+) — Chassis ground (—):

(B134) No. 14 (+) — Chassis ground (—):

Is the voltage 10 V or more?

Yes

Check ignition control system.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostics for Engine Starting Failure>IGNITION CONTROL SYSTEM.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and main relay connector**
- **Poor contact of main relay connector**
- **Poor contact of ECM connector**

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostics for Engine Starting Failure

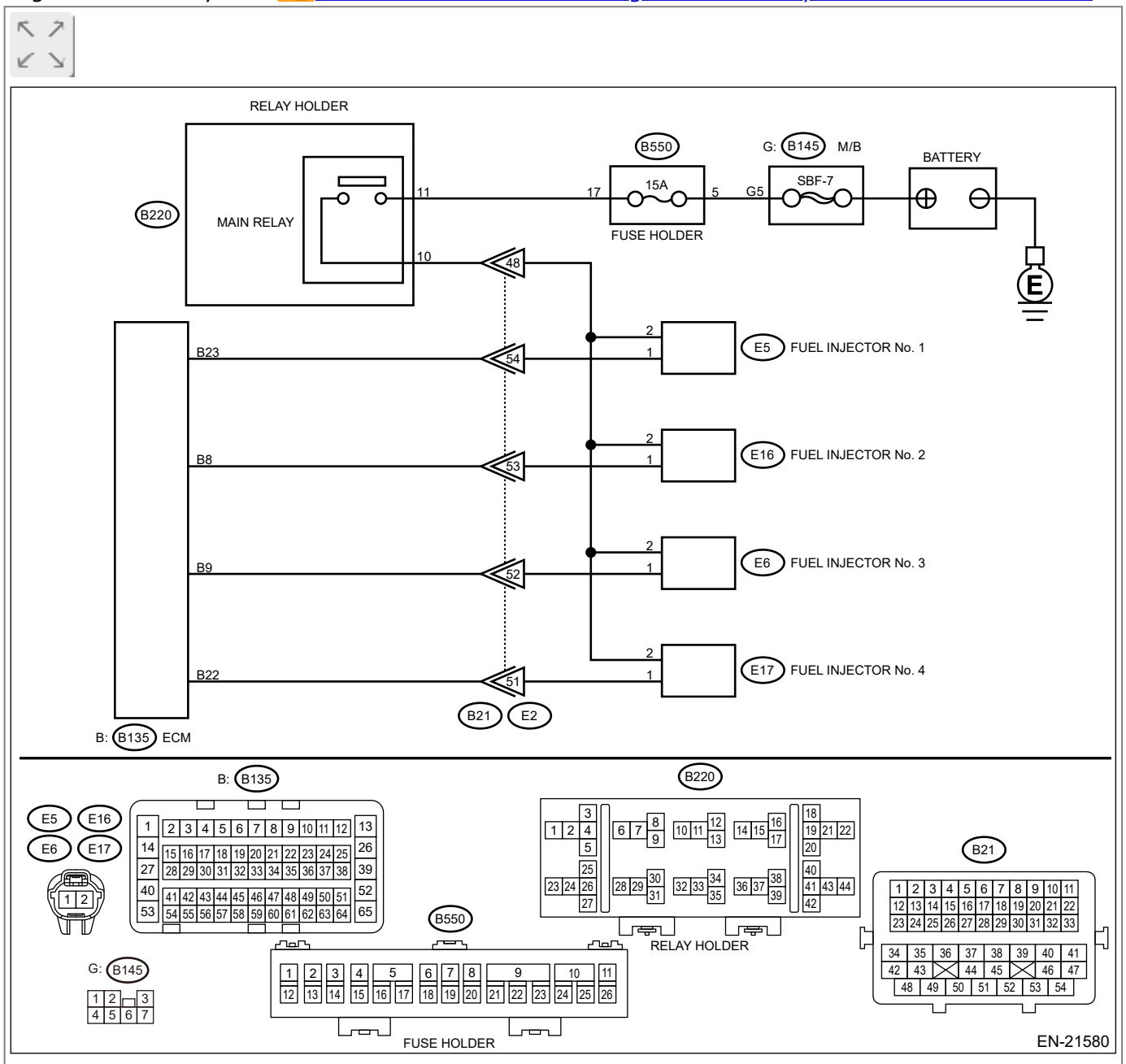
FUEL INJECTOR CIRCUIT

Caution:

- After servicing or replacing faulty parts, perform **Clear Memory** Ref. to **ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode.** and **Inspection Mode** Ref. to **ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.**
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System Ref. to **WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.**



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1. CHECK OPERATION OF EACH FUEL INJECTOR.




While cranking the engine, check each fuel injector emits operating sound. Use a sound scope or attach a screwdriver to the injector to listen to sounds for this check.

Does the fuel injector emit operating sound?

Yes

Check the fuel pressure.  [Ref. to MECHANICAL\(H4DO\)>Fuel Pressure>INSPECTION.](#)

No

 [Go to 2.](#)

2. CHECK POWER SUPPLY TO EACH FUEL INJECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector.
3. Turn the ignition switch to ON.
4. Measure the power supply voltage between fuel injector terminal and engine ground.

Connector & terminal

- #1 (E5) No. 2 (+) — Engine ground (-):
- #2 (E16) No. 2 (+) — Engine ground (-):
- #3 (E6) No. 2 (+) — Engine ground (-):
- #4 (E17) No. 2 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between main relay connector and fuel injector connector**
- **Poor contact of main relay connector**
- **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and fuel injector connector.


Connector & terminal

- #1 (B135) No. 23 — (E5) No. 1:

- #2 (B135) No. 8 — (E16) No. 1:
- #3 (B135) No. 9 — (E6) No. 1:
- #4 (B135) No. 22 — (E17) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and fuel injector connector**
- **Poor contact of coupling connector**

4. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

Measure the resistance between ECM connector and chassis ground.

Connector & terminal

- #1 (B135) No. 23 — Chassis ground:
- #2 (B135) No. 8 — Chassis ground:
- #3 (B135) No. 9 — Chassis ground:
- #4 (B135) No. 22 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

5. CHECK EACH FUEL INJECTOR.


Measure the resistance between each fuel injector terminals.

Terminals

- No. 1 —No. 2:

Is the resistance 5 — 20 Ω ?

Yes

 [Go to 6.](#)

Replace the faulty fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)](#)

No

[\(H4DO\)>Fuel Injector.](#)

6. CHECK FOR POOR CONTACT.




Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes

Repair the poor contact of ECM connector.



No

Inspection using "General Diagnostic Table" [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>General Diagnostic Table>INSPECTION.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostics for Engine Starting Failure

FUEL PUMP CIRCUIT

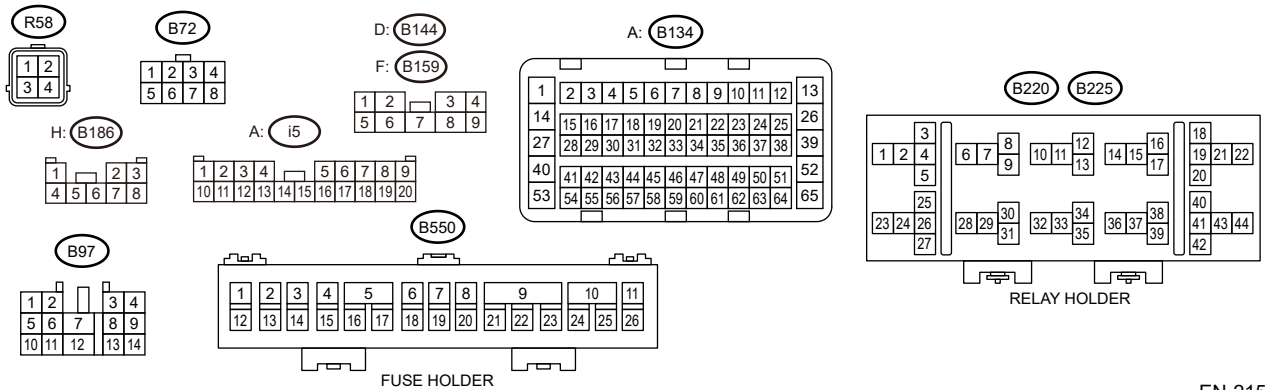
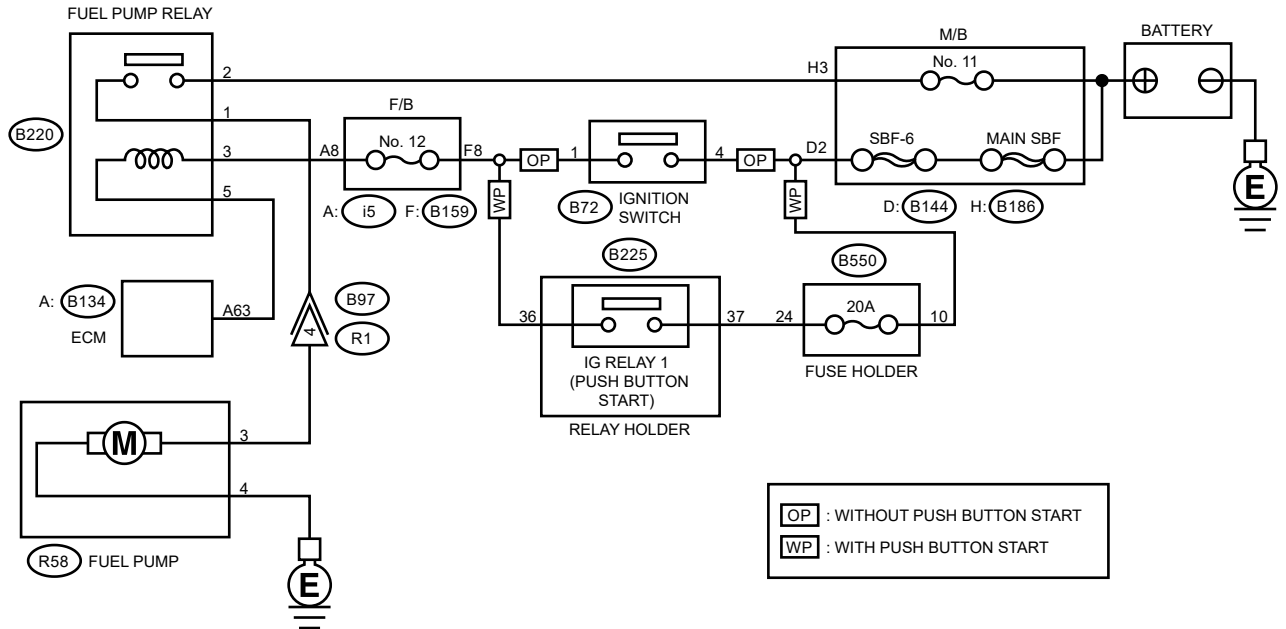
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21578


1. CHECK OPERATING SOUND OF FUEL PUMP.



Check if the fuel pump operates for two seconds when turning the ignition switch to ON.


Note:

Fuel pump operation can be executed using the Subaru Select Monitor.


Refer to "Active Test" for the procedures.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Active Test.](#)

Does the fuel pump emit operating sound?

Yes

Check the fuel injector circuit.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostics for Engine Starting Failure>FUEL INJECTOR CIRCUIT.](#)

No

 [Go to 2.](#)

2. CHECK GROUND CIRCUIT OF FUEL PUMP.

1. Turn the ignition switch to OFF.
2. Remove the fuel pump access hole lid.
3. Disconnect the connector from fuel pump.
4. Measure the resistance of harness between fuel pump and chassis ground.

Connector & terminal

(R58) No. 4 — Chassis ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit in harness between fuel pump connector and chassis ground terminal.

3. CHECK POWER SUPPLY TO FUEL PUMP.


1. Turn the ignition switch to ON.
2. Measure the voltage of power supply circuit between fuel pump connector and chassis ground.

Connector & terminal

(R58) No. 3 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Replace the fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Pump.](#)

No

 [Go to 4.](#)

4. CHECK HARNESS BETWEEN FUEL PUMP AND FUEL PUMP RELAY CONNECTOR.



1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between fuel pump connector and fuel pump relay connector.

Connector & terminal

(R58) No. 3 — (B220) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 5.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- Open circuit in harness between fuel pump connector and fuel pump relay connector
- Poor contact of coupling connector

5. CHECK HARNESS BETWEEN FUEL PUMP AND FUEL PUMP RELAY CONNECTOR.



Measure the resistance of harness between fuel pump connector and fuel pump relay connector.

Connector & terminal

(R58) No. 3 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 6.](#)

No

Repair the short circuit to ground in harness between fuel pump connector and fuel pump relay connector.

6. CHECK FUEL PUMP RELAY.




1. Remove the fuel pump relay.
2. Connect the battery to fuel pump relay terminals No. 3 and No. 5.
3. Measure the resistance between fuel pump relay terminals.

Terminals


No. 1 —No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 7.](#)

No

Replace the fuel pump relay.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel Pump Relay.](#)

7. CHECK HARNESS BETWEEN ECM AND FUEL PUMP RELAY CONNECTOR.


1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and fuel pump relay connector.

Connector & terminal

(B134) No. 63 — (B220) No. 5:

Is the resistance less than 1 Ω ?

Yes

 [Go to 8.](#)

No

Repair the open circuit of harness between ECM connector and fuel pump relay connector.

8. CHECK POWER SUPPLY OF FUEL PUMP RELAY.

1. Turn the ignition switch to ON.
2. Measure the voltage between fuel pump relay connector and chassis ground.

Connector & terminal

(B220) No. 2 (+) — Chassis ground (-):

(B220) No. 3 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Repair the poor contact of ECM connector.



No

Repair the open or ground short in the harness of power supply circuit.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostics for Engine Starting Failure

IGNITION CONTROL SYSTEM

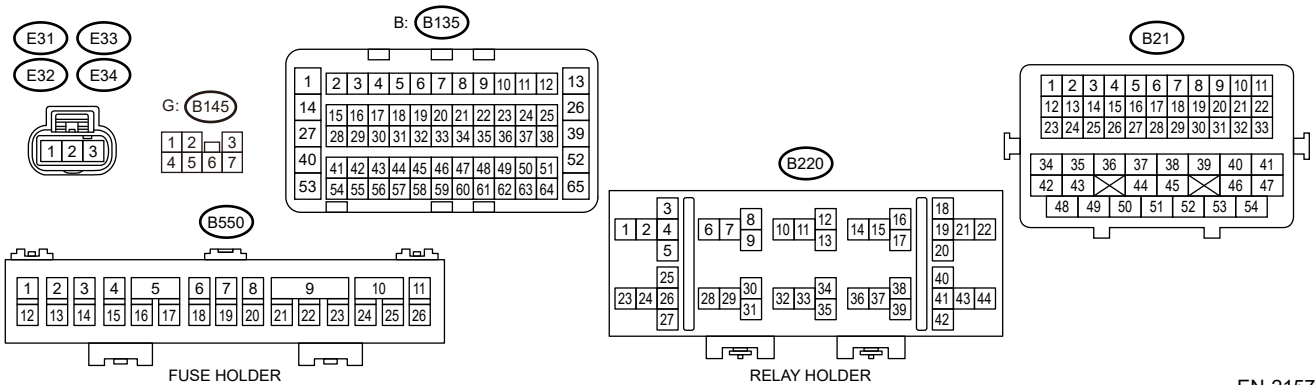
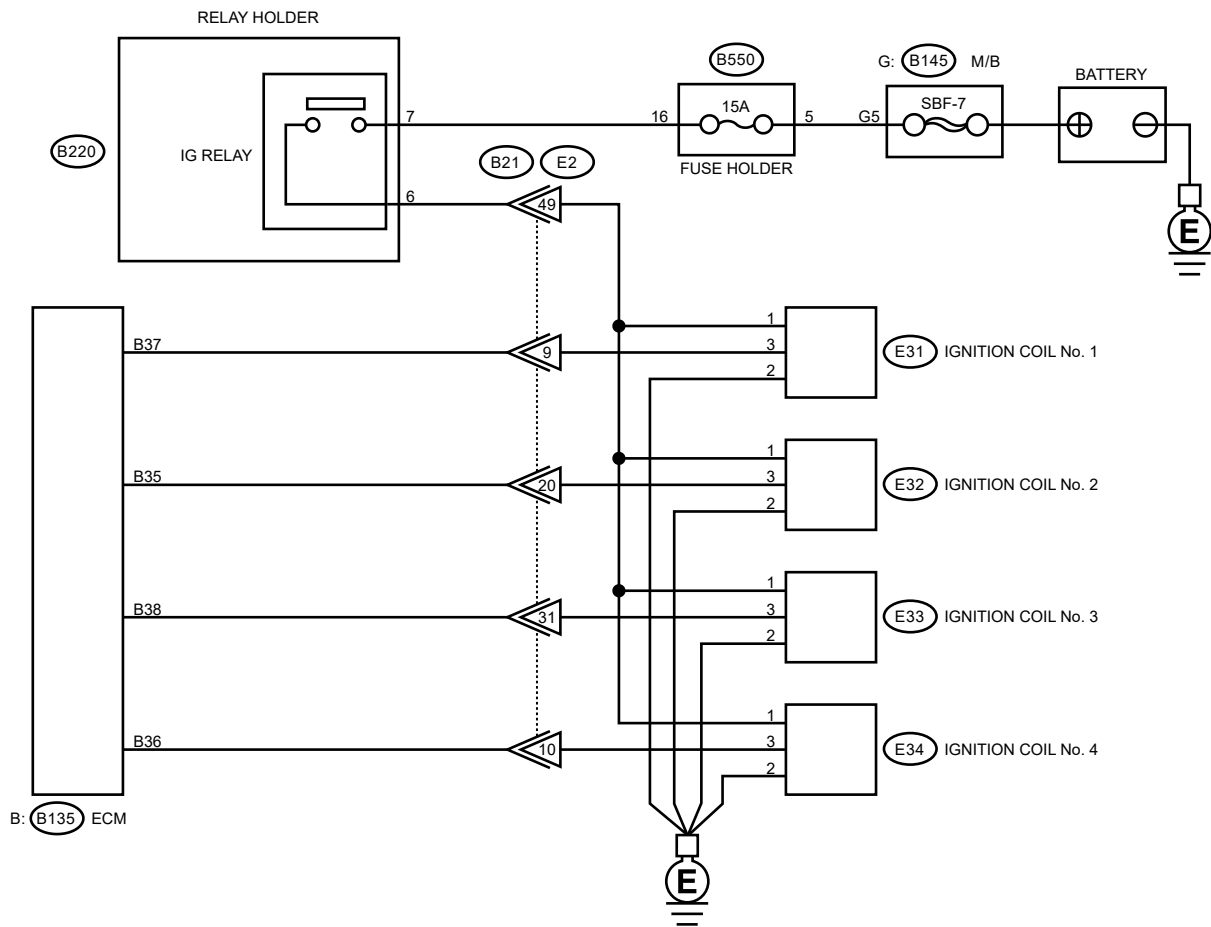
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.






EN-21576

1. CHECK SPARK PLUG CONDITION.


1. Remove the spark plug. Ref. to [IGNITION\(H4DO\)>Spark Plug>REMOVAL.](#)
2. Check the spark plug condition. Ref. to [IGNITION\(H4DO\)>Spark Plug>INSPECTION.](#)

Is the spark plug condition normal?


Yes

 [Go to 2.](#)

No


Replace the spark plug.  [Ref. to IGNITION\(H4DO\)>Spark Plug.](#)

2. CHECK IGNITION SYSTEM FOR SPARKS.

1. Connect the spark plug to ignition coil.
2. Release the fuel pressure.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Fuel>PROCEDURE > RELEASING OF FUEL PRESSURE.](#)
3. Contact the spark plug thread portion to engine.
4. While opening the throttle valve fully, crank the engine to check that spark occurs at each cylinder.

Does spark occur at each cylinder?

Yes

Check fuel pump system.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostics for Engine Starting Failure>FUEL PUMP CIRCUIT.](#)

No

 [Go to 3.](#)

3. CHECK IGNITION COIL POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ignition coil.
3. Turn the ignition switch to ON.
4. Measure the voltage between ignition coil connector and engine ground.

Connector & terminal

(E31) No. 1 (+) — Engine ground (—):

(E32) No. 1 (+) — Engine ground (—):

(E33) No. 1 (+) — Engine ground (—):

(E34) No. 1 (+) — Engine ground (—):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open or short to ground in harness of power supply circuit**
- **Poor contact of coupling connector**

- Blown out of fuse

4. CHECK HARNESS OF IGNITION COIL GROUND CIRCUIT.


1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between ignition coil connector and engine ground.

Connector & terminal

- (E31) No. 2 — Engine ground:
- (E32) No. 2 — Engine ground:
- (E33) No. 2 — Engine ground:
- (E34) No. 2 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 5.](#)

No

Repair the open circuit in harness between ignition coil connector and engine grounding terminal.

5. CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and ignition coil connector.

Connector & terminal

- (B135) No. 37 — (E31) No. 3:
- (B135) No. 35 — (E32) No. 3:
- (B135) No. 38 — (E33) No. 3:
- (B135) No. 36 — (E34) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 6.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and the ignition coil connector**
- **Poor contact of coupling connector**

6. CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR.



Measure the resistance of harness between ECM connector and engine ground.

Connector & terminal:

(B135) No. 37 — Engine ground:

(B135) No. 35 — Engine ground:

(B135) No. 38 — Engine ground:

(B135) No. 36 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 7.](#)

No

Repair the ground short circuit of harness between ECM connector and ignition coil connector.

7. CHECK FOR POOR CONTACT.




Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes






Repair the poor contact of ECM connector.

No

Replace the ignition coil  [Ref. to IGNITION\(H4DO\)>Ignition Coil.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostics for Engine Starting Failure

PROCEDURE



1. Check of the fuel amount
↓
2. Inspection of starter motor circuit  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics for Engine Starting Failure>STARTER MOTOR CIRCUIT.
↓
3. Inspection of ECM power supply and ground line  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics for Engine Starting Failure>CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM).
↓
4. Inspection of ignition control system  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics for Engine Starting Failure>IGNITION CONTROL SYSTEM.
↓
5. Inspection of fuel pump circuit  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics for Engine Starting Failure>FUEL PUMP CIRCUIT.
↓
6. Inspection of fuel injector circuit  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics for Engine Starting Failure>FUEL INJECTOR CIRCUIT.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostics for Engine Starting Failure

STARTER MOTOR CIRCUIT

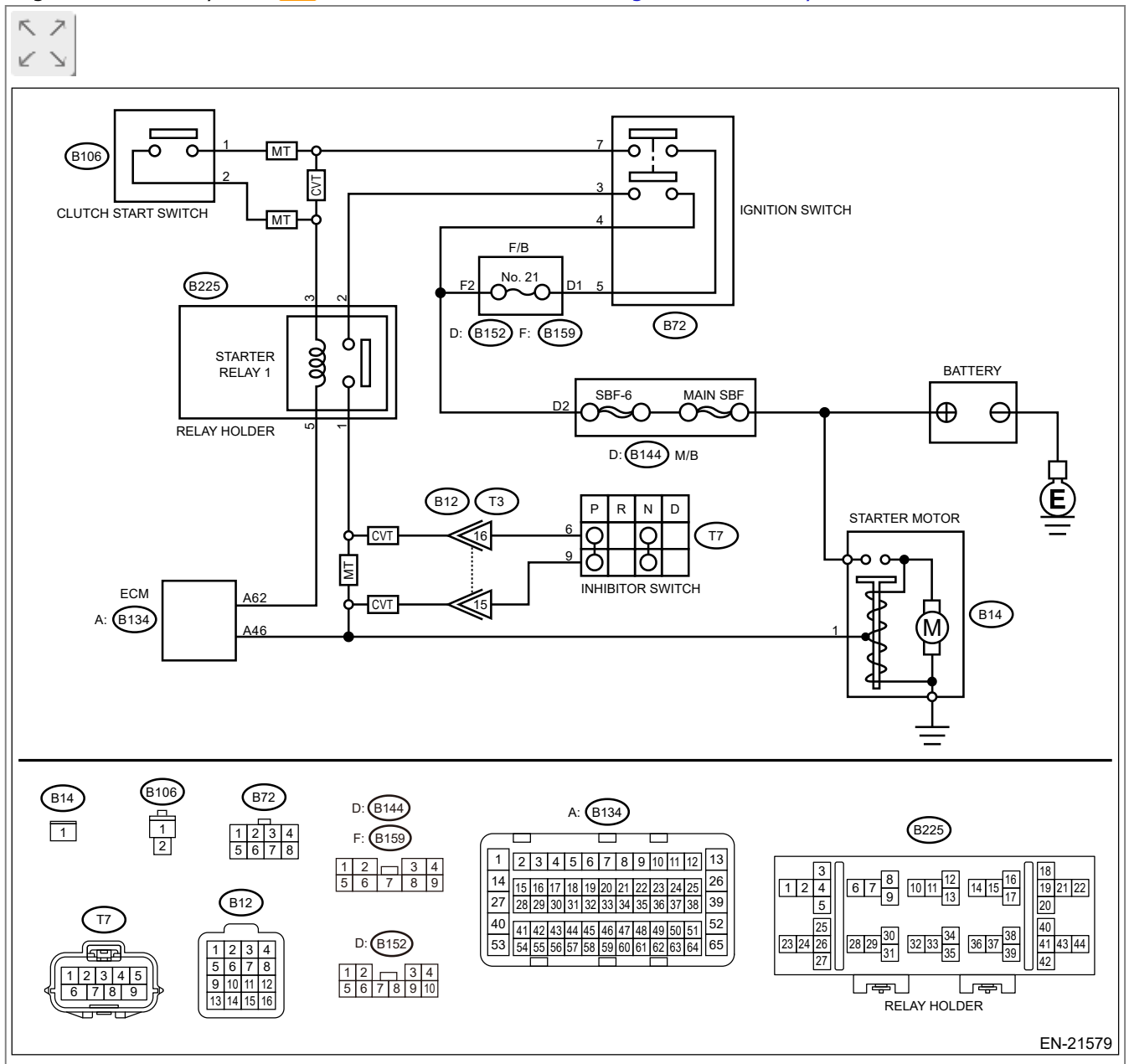
1. MODEL WITHOUT PUSH BUTTON START

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK BATTERY.


Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)

Is the battery OK?

Yes

 [Go to 2.](#)

No

Charge or replace the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)

2. CHECK OPERATION OF STARTER MOTOR.

Does the starter motor operate?


Yes

 [Go to 3.](#)


No

 [Go to 4.](#)


3. CHECK DTC.

Are any DTCs displayed?  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Check ignition control system.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostics for Engine Starting Failure>IGNITION CONTROL SYSTEM.](#)

4. CHECK INPUT SIGNAL FOR STARTER MOTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from starter motor.
3. Turn the ignition switch to START.
4. Measure the voltage between the starter motor connector and the engine ground.

Connector & terminal


(B14) No. 1 (+) — Engine ground (-):

Note:

- For CVT model, place the select lever in "P" range or "N" range.
- For model with clutch start switch, depress the clutch pedal.

Is the voltage 10 V or more?

Yes

Check the starter motor.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DQ\)>Starter.](#)

No

 [Go to 5.](#)

5. CHECK HARNESS BETWEEN BATTERY AND IGNITION SWITCH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ignition switch.
3. Measure the power supply voltage between ignition switch connector and chassis ground.

Connector & terminal

(B72) No. 4 (+) — Chassis ground (—):

(B72) No. 5 (+) — Chassis ground (—):

Is the voltage 10 V or more?

Yes

 [Go to 6.](#)

No

Repair the power supply circuit.

6. CHECK IGNITION SWITCH.

Measure the resistance between ignition switch terminals after turning the ignition switch to START position.

Terminals

No. 3 —No. 4:


No. 5 —No. 7:

Is the resistance less than 1 Ω ?

Yes

 [Go to 7.](#)

No

Replace the ignition switch.  [Ref. to SECURITY AND LOCKS>Ignition Key Lock>REPLACEMENT.](#)

7. CHECK INPUT VOLTAGE OF STARTER RELAY.




1. Turn the ignition switch to OFF.
2. Remove the starter relay.
3. Connect the connector to ignition switch.
4. Measure the voltage between starter relay connector and chassis ground after turning the ignition switch to START position.

Connector & terminal

(B225) No. 2 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 8.](#)

No

Repair the open circuit of harness between starter relay and ignition switch connector.

8. CHECK HARNESS BETWEEN ECM AND STARTER RELAY CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and starter relay connector.

Connector & terminal

(B134) No. 62 — (B225) No. 5:

Is the resistance less than 1 Ω ?

Yes

 [Go to 9.](#)

No

Repair the open circuit of harness between ECM connector and starter relay connector.

9. CHECK STARTER RELAY.




1. Connect the battery to starter relay terminals No. 3 and No. 5.
2. Measure the resistance between starter relay terminals.

Terminals


No. 1 —No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 10.](#)


No

Replace the starter relay.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Electrical Component Location.](#)


10. CHECK TRANSMISSION TYPE.

Is the transmission type CVT?

Yes

 [Go to 11.](#)

No

 [Go to 15.](#)

11. CHECK INPUT VOLTAGE OF STARTER RELAY.


Measure the voltage between starter relay connector and chassis ground after turning the ignition switch to START position.

Connector & terminal

(B225) No. 3 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 12.](#)

No

Check the following item and repair if necessary.

- Blown out of fuse
- Open or short circuit to ground in harness between starter relay and ignition switch connector

12. CHECK HARNESS BETWEEN STARTER RELAY AND INHIBITOR SWITCH CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from inhibitor switch.
3. Measure the resistance of harness between starter relay connector and inhibitor switch connector.

Connector & terminal

(B225) No. 1 — (T7) No. 6:

Is the resistance less than 1 Ω ?

Yes

 [Go to 13.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between starter relay connector and inhibitor switch connector**
- **Poor contact of coupling connector**

13. CHECK HARNESS BETWEEN INHIBITOR SWITCH AND STARTER MOTOR.


Measure the resistance of harness between the inhibitor switch connector and starter motor.

Connector & terminal

(T7) No. 9 – (B14) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 14.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between inhibitor switch connector and starter motor**
- **Poor contact of coupling connector**

14. CHECK INHIBITOR SWITCH.


1. Place the select lever in "P" range and "N" range.
2. Measure the resistance between inhibitor switch terminals.

Terminals


No. 6 – No. 9:

Is the resistance less than 1 Ω ?

Yes

Check the engine control module (ECM) power supply and ground line.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostics for Engine Starting Failure>CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE \(ECM\).](#)

No

Replace the inhibitor switch.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Inhibitor Switch.](#)

15. CHECK INPUT VOLTAGE OF CLUTCH START SWITCH.


1. Disconnect the connector from clutch start switch.
2. Turn the ignition switch to START.
3. Measure the voltage between the clutch start switch connector and chassis ground.

Connector & terminal

(B106) No. 1 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 16.](#)

No

Check the following item and repair if necessary.

- Blown out of fuse
- Open or short circuit to ground in harness between ignition switch connector and clutch start switch connector

16. CHECK CLUTCH START SWITCH.


1. Turn the ignition switch to OFF.
2. Measure the resistance between clutch start switch terminals while keeping the clutch pedal depressed.

Terminals

No. 1 —No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 17.](#)

No

Replace the clutch start switch.  [Ref. to CLUTCH SYSTEM>Clutch Switch.](#)

17. CHECK HARNESS BETWEEN STARTER RELAY AND CLUTCH START SWITCH.


Measure the resistance of harness between starter relay and clutch start switch connector.

Connector & terminal

(B225) No. 3 — (B106) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 18.](#)

No

Repair the open circuit in harness between starter relay and clutch start switch connector.

18. CHECK HARNESS BETWEEN STARTER RELAY CONNECTOR AND STARTER MOTOR CONNECTOR.


Measure the resistance of harness between starter relay connector and starter motor connector.

Connector & terminal

(B225) No. 1 — (B14) No. 1:

Is the resistance less than 1 Ω ?

Yes



Check the engine control module (ECM) power supply and ground line.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostics for Engine Starting Failure>CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE \(ECM\).](#)

No


Repair the open circuit in harness between starter relay connector and starter motor connector.

2. MODEL WITH PUSH BUTTON START

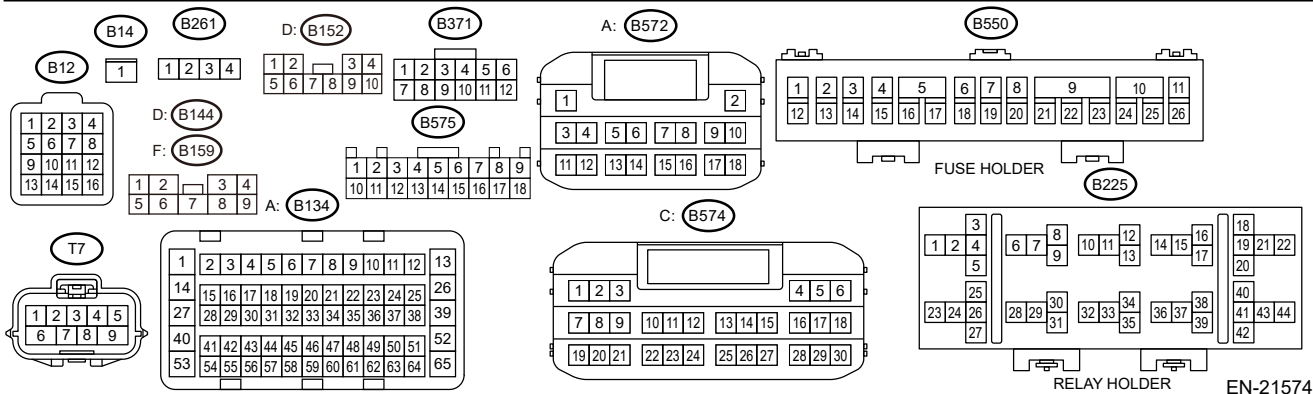
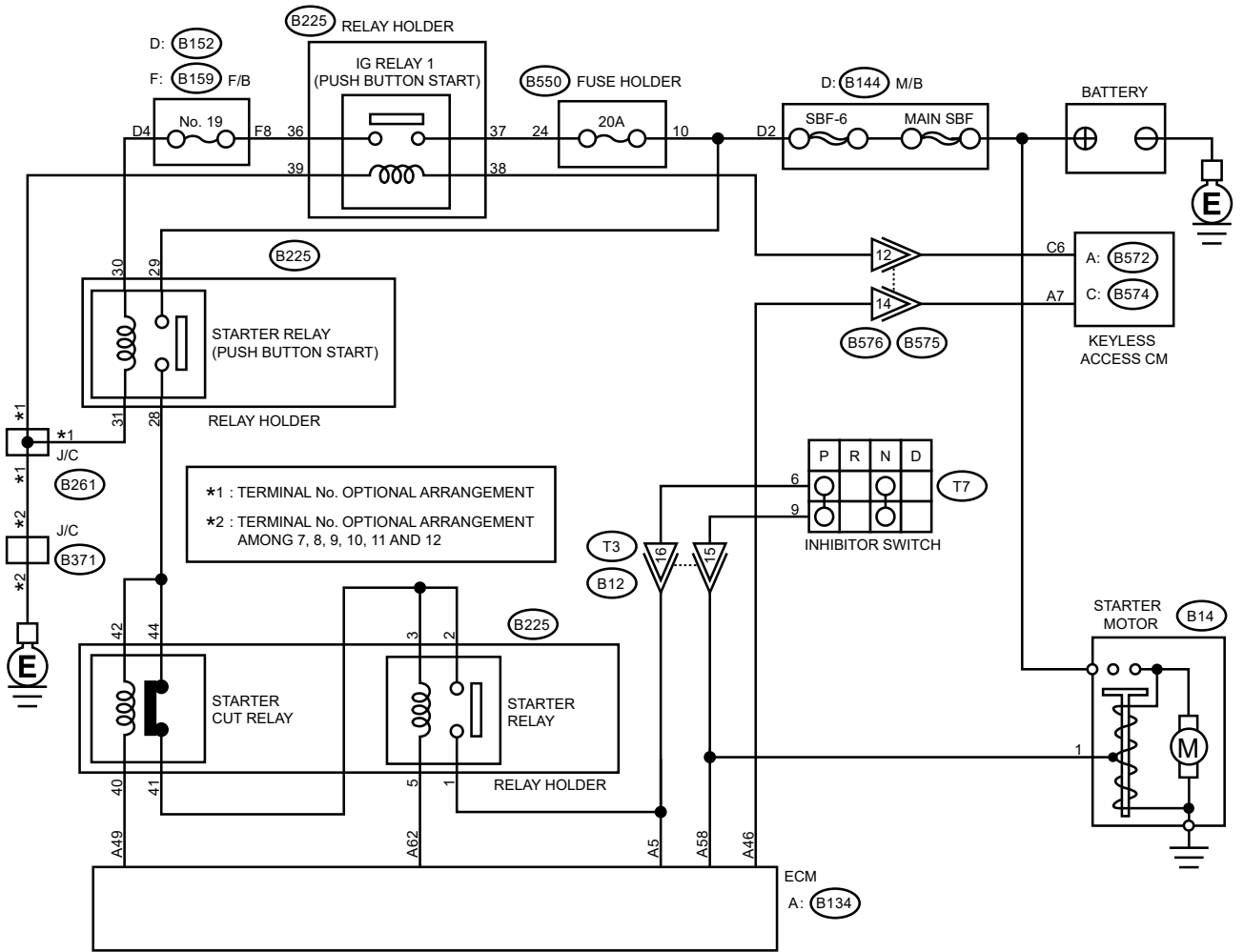
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory**  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#) **and Inspection Mode**  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Inspection Mode.](#)
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM > NON-TURBO MODEL \(WITH PUSH BUTTON START\).](#)





1. CHECK BATTERY.


Check the battery. [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)

Is the battery OK?

Yes

[Go to 2.](#)


No

Charge or replace the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)


2. CHECK OPERATION OF STARTER MOTOR.

Does the starter motor operate?


Yes

 [Go to 3.](#)


No

 [Go to 4.](#)


3. CHECK DTC.

Are any DTCs displayed?  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Check ignition control system.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostics for Engine Starting Failure>IGNITION CONTROL SYSTEM.](#)

4. CHECK PUSH BUTTON IGNITION SWITCH.

Press the push button ignition switch twice with the ignition OFF (ACC OFF).

Note:


Release the brake pedal.

Does the ignition turn to ON?

Yes

 [Go to 5.](#)

No

Check the push button start system.  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>General Diagnostic Table>INSPECTION > POWER SUPPLY SWITCHING SYSTEM.](#)

5. CHECK PUSH BUTTON IGNITION SWITCH.

1. Depress the brake pedal.

Note:

Shift the select lever to "P" range.


2. Check the push button ignition switch indicator.

Does the indicator turn to green?

Yes

 [Go to 6.](#)


No

Check the push button start system.  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > ENGINE DOES NOT START.](#)

6. CHECK START SWITCH SIGNAL.

1. Using the Subaru Select Monitor, read the waveform in [Starter Switch].


Note:

For detailed operation procedures, refer to "Current Data Display For Engine".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)

2. Press the push button ignition switch once with the brake pedal depressed.

Does a waveform occur in [Starter Switch]?

Yes

 [Go to 10.](#)

No

 [Go to 7.](#)

7. CHECK HARNESS BETWEEN ECM AND KEYLESS ACCESS CM.

1. Turn the ignition to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the keyless access CM.
4. Measure the resistance of harness between ECM connector and keyless access CM.

Connector & terminal

(B134) No. 46 — (B572) No. 7:

Is the resistance less than 1 Ω ?

Yes

 [Go to 8.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and keyless access CM**
- **Poor contact of coupling connector**

8. CHECK HARNESS BETWEEN ECM AND KEYLESS ACCESS CM.

Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 46 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 9.](#)

No

Repair the short circuit to ground in harness between ECM connector and keyless access CM.

9. CHECK START SWITCH SIGNAL.

1. Connect the connector to ECM.
2. Connect the connector to the keyless access CM.
3. Read the waveform of start switch signal using an oscilloscope.
4. Press the push button ignition switch once with the brake pedal depressed.

Connector & terminal

(B134) No. 46 (+) — Chassis ground (-):

Does waveform of the start switch signal occur?

Yes

Repair the poor contact of ECM connector.

No

Repair the poor contact of keyless access CM connector.

10. CHECK INPUT SIGNAL FOR STARTER MOTOR.

1. Turn the ignition to OFF.
2. Disconnect the connector from starter motor.
3. Place the select lever in "P" range or "N" range.
4. Press the push button ignition switch once with the brake pedal depressed.
5. Measure the voltage between the starter motor connector and the engine ground.

Connector & terminal


(B14) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

Check the starter motor.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Starter.](#)

No

 [Go to 11.](#)

11. CHECK IG RELAY 1 (PUSH BUTTON START) POWER SUPPLY.

1. Remove the IG relay 1 (push button start).
2. Turn the ignition to ON.
3. Measure the voltage between the IG relay 1 (push button start) connector and chassis ground.


Connector & terminal

(B225) No. 37 (+) — Chassis ground (—):

(B225) No. 38 (+) — Chassis ground (—):

Is the voltage 10 V or more?

Yes

 [Go to 12.](#)

No

Check the following item and repair or replace if necessary.

- Blown out of fuse
- Open circuit or short circuit to ground in harness between IG relay 1 (push button start) connector and keyless access CM
- Open circuit or short circuit to ground in harness between IG relay 1 (push button start) connector and battery
- Poor contact of coupling connector

12. CHECK HARNESS BETWEEN IG RELAY 1 (PUSH BUTTON START) CONNECTOR AND CHASSIS GROUND.


1. Turn the ignition to OFF.
2. Measure the resistance of harness between the IG relay 1 (push button start) connector and chassis ground.

Connector & terminal

(B225) No. 39 — Chassis ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 13.](#)

No

Check the following item and repair or replace if necessary.

- Open circuit in harness between IG relay 1 (push button start) connector and chassis ground
- Poor contact of joint connector

13. CHECK IG RELAY 1 (PUSH BUTTON START).



1. Connect the battery to IG relay 1 (push button start) terminals No. 38 and No. 39.
2. Measure the resistance between IG relay 1 (push button start) terminals.

Terminals

No. 36 —No. 37:

Is the resistance less than 1 Ω ?

Yes

[Go to 14.](#)

No

Replace the IG relay 1 (push button start). [Ref. to SECURITY AND LOCKS>IG Relay1 \(Push Button Start\).](#)

14. CHECK STARTER RELAY (PUSH BUTTON START) POWER SUPPLY.



1. Install the IG relay 1 (push button start).
2. Remove the starter relay (push button start).
3. Turn the ignition to ON.
4. Measure the voltage between starter relay (push button start) connector and chassis ground.

Connector & terminal

(B225) No. 29 (+) — Chassis ground (-):

(B225) No. 30 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

[Go to 15.](#)

No

Check the following item and repair or replace if necessary.

- Blown out of fuse (F/B No. 26)
- Open circuit or short circuit to ground in harness between starter relay (push button start) connector and IG relay 1 (push button start) connector
- Open circuit or short circuit to ground in harness between starter relay (push button start) connector and battery

15. CHECK HARNESS BETWEEN STARTER RELAY (PUSH BUTTON START) CONNECTOR AND CHASSIS GROUND.


1. Turn the ignition to OFF.
2. Measure the resistance of harness between starter relay (push button start) connector and chassis ground.

Connector & terminal

(B225) No. 31 — Chassis ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 16.](#)

No

Check the following item and repair or replace if necessary.

- Open circuit in harness between starter relay (push button start) connector and chassis ground
- Poor contact of joint connector

16. CHECK STARTER RELAY (PUSH BUTTON START).


1. Connect the battery to starter relay (push button start) terminals No. 30 and No. 31.
2. Measure the resistance between starter relay (push button start) terminals.

Terminals


No. 28 —No. 29:

Is the resistance less than 1 Ω ?

Yes

 [Go to 17.](#)

No

Replace the starter relay (push button start).  [Ref. to SECURITY AND LOCKS>Starter Relay \(Push Button Start\).](#)

17. CHECK HARNESS BETWEEN STARTER RELAY (PUSH BUTTON START) CONNECTOR AND STARTER CUT RELAY CONNECTOR.

1. Remove the starter cut relay.
2. Measure the resistance of harness between starter relay (push button start) connector and starter cut relay connector.


Connector & terminal

(B225) No. 28 — (B225) No. 42:

(B225) No. 28 — (B225) No. 44:

Is the resistance less than 1 Ω ?

Yes

 [Go to 18.](#)

No

Repair the open circuit in harness between starter relay (push button start) connector and starter cut relay connector.

18. CHECK HARNESS BETWEEN ECM AND STARTER CUT RELAY CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance between starter cut relay connector and chassis ground.

Connector & terminal

(B225) No. 40 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 19.](#)

No

Repair the short circuit to ground in harness between ECM connector and starter cut relay connector.

19. CHECK STARTER CUT RELAY.

Measure the resistance between starter cut relay terminals.

Terminals


No. 41 —No. 44:

Is the resistance less than 1 Ω ?

Yes

 [Go to 20.](#)

No

Replace the starter cut relay.  [Ref. to SECURITY AND LOCKS>Starter Cut Relay.](#)

20. CHECK HARNESS BETWEEN STARTER CUT RELAY CONNECTOR AND STARTER RELAY CONNECTOR.

1. Remove the starter relay.
2. Measure the resistance of harness between starter cut relay connector and starter relay connector.


Connector & terminal

(B225) No. 41 — (B225) No. 2:

(B225) No. 41 — (B225) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 21.](#)

No

Repair the open circuit in harness between starter cut relay connector and starter relay connector.

21. CHECK HARNESS BETWEEN ECM AND STARTER RELAY CONNECTOR.




Measure the resistance of harness between ECM connector and starter relay connector.

Connector & terminal

(B134) No. 62 — (B225) No. 5:

Is the resistance less than 1 Ω ?

Yes

 [Go to 22.](#)

No

Repair the open circuit of harness between ECM connector and starter relay connector.

22. CHECK STARTER RELAY.




1. Connect the battery to starter relay terminals No. 3 and No. 5.
2. Measure the resistance between starter relay terminals.

Terminals

No. 1 —No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 23.](#)

No

Replace the starter relay.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Electrical Component Location>LOCATION.](#)

23. CHECK HARNESS BETWEEN STARTER RELAY CONNECTOR AND INHIBITOR SWITCH CONNECTOR.



1. Disconnect the connector from inhibitor switch.
2. Measure the resistance of harness between starter relay connector and inhibitor switch


connector.

Connector & terminal

(B225) No. 1 — (T7) No. 6:

Is the resistance less than 1 Ω ?

Yes

 [Go to 24.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between starter relay connector and inhibitor switch connector**
- **Poor contact of coupling connector**

24. CHECK INHIBITOR SWITCH.


1. Place the select lever in "P" range or "N" range.
2. Measure the resistance between inhibitor switch terminals.

Terminals


No. 6 —No. 9:

Is the resistance less than 1 Ω ?

Yes

 [Go to 25.](#)

No

Replace the inhibitor switch.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Inhibitor Switch.](#)

25. CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and inhibitor switch connector.


Connector & terminal

(B134) No. 5 — (T7) No. 6:

(B134) No. 58 — (T7) No. 9:

Is the resistance less than 1 Ω ?

Yes

 [Go to 26.](#)

repair the harness and connector.

No

Note:


In this case, repair the following item:

- **Open circuit in harness between ECM connector and inhibitor switch connector**
- **Poor contact of coupling connector**

26. CHECK NEUTRAL POSITION SWITCH SIGNAL.

1. Connect all relays to their proper positions.
2. Connect all connectors to their proper positions.
3. Using the Subaru Select Monitor, read the value in [Neutral Position Switch].


Note:

For detailed operation procedures, refer to "Current Data Display For Engine".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor.](#)

4. Turn the ignition to ON.
5. Place the select lever in "P" range or "N" range.

Is [ON] displayed?

Yes

Check the engine control module (ECM) power supply and ground line.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostics for Engine Starting Failure>CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE \(ECM\).](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:


- **Open circuit in harness between inhibitor switch connector and starter motor connector**
- **Poor contact of coupling connector**

ENGINE (DIAGNOSTICS)(H4DO) > Drive Cycle

PROCEDURE

It is necessary to perform the drive cycle listed below if DTC is not found in the Inspection Mode. It is possible to complete diagnosis of the DTC by performing the indicated drive cycle. After the repair for the DTC, perform a necessary drive cycle and make sure the function recovers and the DTC is recorded.

1. PREPARATION FOR DRIVE CYCLE

1. Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 L (5.3—10.6 US gal, 4.4—8.8 Imp gal)].
2. After performing the diagnostics and clearing memory, check that no DTC remains.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)

Note:


Perform the drive cycle after warming up the engine except when the engine coolant temperature at engine start is specified.

2. DRIVE CYCLE A

DTC	Item	Condition
P0128	COOLANT THERMOSTAT (ENGINE COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE)	—
P0141	O2 SENSOR HEATER CIRCUIT BANK 1 SENSOR 2	—
P014C	A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1	—
P014D	A/F / O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 1	—
P015A	A/F / O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 1	—
P015B	A/F / O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 1	—
P0171	SYSTEM TOO LEAN BANK 1	Diagnosis completes in drive cycle B or C as well.
P0172	SYSTEM TOO RICH BANK 1	Diagnosis completes in drive cycle B or C as well.
P0300	RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED	Diagnosis completes in drive cycle B or C as well.
P0301	CYLINDER 1 MISFIRE DETECTED	Diagnosis completes in drive cycle B or C as well.
P0302	CYLINDER 2 MISFIRE DETECTED	Diagnosis completes in drive cycle B or C as well.
P0303	CYLINDER 3 MISFIRE DETECTED	Diagnosis completes in drive cycle B or C as well.
P0304	CYLINDER 4 MISFIRE DETECTED	Diagnosis completes in drive cycle B or C as well.
P0459	EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT HIGH	—
P0562	SYSTEM VOLTAGE LOW	—

P0563	SYSTEM VOLTAGE HIGH	—
P2096	POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1	Diagnosis completes in drive cycle B or C as well.
P2097	POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1	Diagnosis completes in drive cycle B or C as well.
P2195	A/F /O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 1	—
P2196	A/F /O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 1	—

Diagnostic procedure:


1. Drive for 20 minutes or more at a constant speed of 80 km/h (50 MPH) or more.
2. Stop the vehicle and idle for one minute.
3. Read the temporary code using the Subaru Select Monitor or general scan tool.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)

3. DRIVE CYCLE B

DTC	Item	Condition
P0125	INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL	Engine coolant temperature at starting: Less than -15°C (5°F)
P0137	O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 2	—
P0138	O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 2	—
P0171	SYSTEM TOO LEAN BANK 1	Diagnosis completes in drive cycle A or C as well.
P0172	SYSTEM TOO RICH BANK 1	Diagnosis completes in drive cycle A or C as well.
P0300	RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED	Diagnosis completes in drive cycle A or C as well.
P0301	CYLINDER 1 MISFIRE DETECTED	Diagnosis completes in drive cycle A or C as well.
P0302	CYLINDER 2 MISFIRE DETECTED	Diagnosis completes in drive cycle A or C as well.
P0303	CYLINDER 3 MISFIRE DETECTED	Diagnosis completes in drive cycle A or C as well.
P0304	CYLINDER 4 MISFIRE DETECTED	Diagnosis completes in drive cycle A or C as well.
P0500	VEHICLE SPEED SENSOR "A" CIRCUIT	—
P0506	IDLE CONTROL SYSTEM RPM - LOWER THAN EXPECTED	—
P0507	IDLE CONTROL SYSTEM RPM - HIGHER THAN EXPECTED	—
P0700	TRANSMISSION CONTROL SYSTEM (MIL REQUEST)	—
P2006	TGV CONTROL STUCK CLOSED BANK 1	—
P2007	TGV CONTROL STUCK CLOSED BANK 2	—
P2096	POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1	Diagnosis completes in drive cycle A or C as well.
P2097	POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1	Diagnosis completes in

drive cycle A or C as well.

Diagnostic procedure:

1. Drive at 10 km/h (6 MPH) or more.
2. Stop the vehicle and idle for ten minutes.
3. Read the temporary code using the Subaru Select Monitor or general scan tool.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)

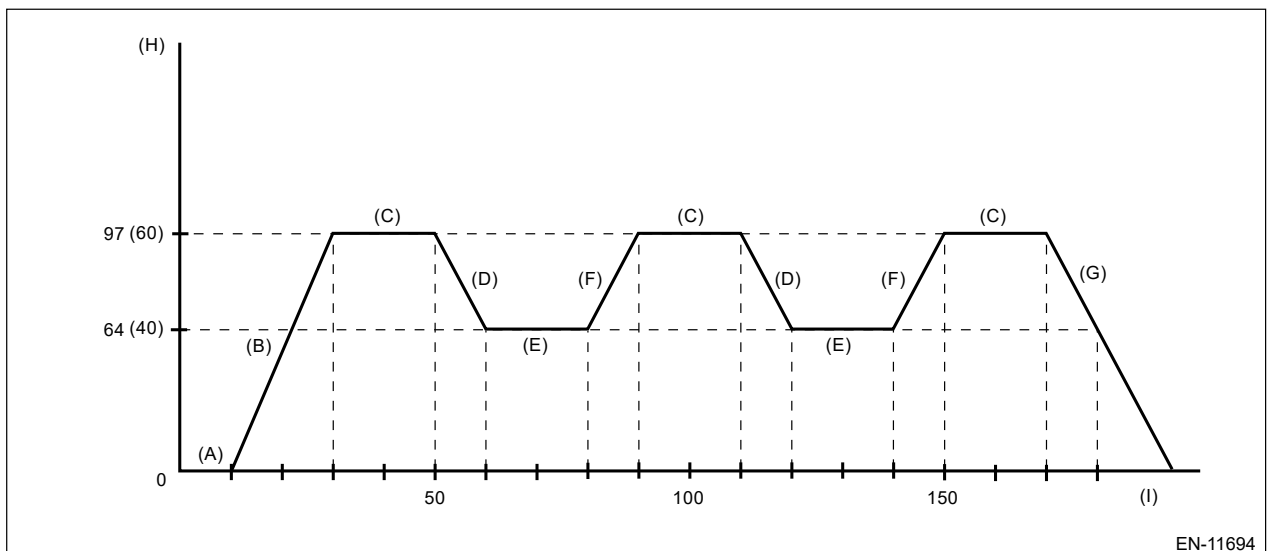
4. DRIVE CYCLE C

DTC	Item	Condition
P000A	"A" CAMSHAFT POSITION SLOW RESPONSE BANK 1	—
P000C	"A" CAMSHAFT POSITION SLOW RESPONSE BANK 2	—
P0011	"A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1	—
P0021	"A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2	—
P0030	A/F / O2 HEATER CONTROL CIRCUIT BANK 1 SENSOR 1	—
P0068	MAP/MAF - THROTTLE POSITION CORRELATION	—
P0101	MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT RANGE/PERFORMANCE	—
P0134	A/F / O2 SENSOR CIRCUIT NO ACTIVITY DETECTED BANK 1 SENSOR 1	—
P013A	O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2	—
P013B	O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 2	—
P013E	O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 2	—
P013F	O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 2	—
P0171	SYSTEM TOO LEAN BANK 1	Diagnosis completes in drive cycle A or B as well.
P0172	SYSTEM TOO RICH BANK 1	Diagnosis completes in drive cycle A or B as well.
P0300	RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED	Diagnosis completes in drive cycle A or B as well.
P0301	CYLINDER 1 MISFIRE DETECTED	Diagnosis completes in drive cycle A or B as well.
P0302	CYLINDER 2 MISFIRE DETECTED	Diagnosis completes in drive cycle A or B as well.
P0303	CYLINDER 3 MISFIRE DETECTED	Diagnosis completes in drive cycle A or B as well.
P0304	CYLINDER 4 MISFIRE DETECTED	Diagnosis completes in drive cycle A or B as well.
P0400	EGR "A" FLOW	—
P0420	CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD BANK 1	—

P0851	PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW	—
P0852	PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH	—
P1449	EVAP SYSTEM CLOG DETECTED (AIR FILTER)	—
P1492	COIL 1 EGR "A" CONTROL CIRCUIT LOW	—
P1493	COIL 1 EGR "A" CONTROL CIRCUIT HIGH	—
P1494	COIL 2 EGR "A" CONTROL CIRCUIT LOW	—
P1495	COIL 2 EGR "A" CONTROL CIRCUIT HIGH	—
P1496	COIL 3 EGR "A" CONTROL CIRCUIT LOW	—
P1497	COIL 3 EGR "A" CONTROL CIRCUIT HIGH	—
P1498	COIL 4 EGR "A" CONTROL CIRCUIT LOW	—
P1499	COIL 4 EGR "A" CONTROL CIRCUIT HIGH	—
P2004	TGV CONTROL STUCK OPEN BANK 1	—
P2005	TGV CONTROL STUCK OPEN BANK 2	—
P2096	POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1	Diagnosis completes in drive cycle A or B as well.
P2097	POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1	Diagnosis completes in drive cycle A or B as well.
P219C	CYLINDER 1 AIR-FUEL RATIO IMBALANCE	—
P219D	CYLINDER 2 AIR-FUEL RATIO IMBALANCE	—
P219E	CYLINDER 3 AIR-FUEL RATIO IMBALANCE	—
P219F	CYLINDER 4 AIR-FUEL RATIO IMBALANCE	—
P2270	O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 2	—
P2271	O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 2	—

Diagnostic procedure:

1. Drive according to the drive pattern described below.




(A) Shift the select lever to "P" range or the shift lever to the neutral position, and cool down the engine by idling it for 10 seconds or more.


(D) Decelerate with fully closed throttle to 64 km/h (40 MPH) or less.

(G) Stop vehicle with the throttle fully closed.

- (B) Accelerate to 97 km/h (60 MPH) or more within 20 seconds. (E) Drive for 20 seconds or more at 64 km/h (40 MPH) or less. (H) Vehicle speed km/h (MPH)
- (C) Drive for 20 seconds or more at 97 km/h (60 MPH) or more. (F) Accelerate to 97 km/h (60 MPH) or more within 10 seconds. (I) Sec.

Note:


- Perform the following only for catalyst system bank 1.
- Check that Catalyst monitoring completed is "YES", and read the temporary code.
- If Catalyst monitoring completed indicates "NO", the diagnosis has not been completed. In this case, repeat driving until the reading changes to "YES".
- Read the temporary "data monitor" using the Subaru Select Monitor or general scan tool.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

2. Read the temporary code using the Subaru Select Monitor or general scan tool.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)

5. DRIVE CYCLE F

DTC	Item	Condition
P0111	INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE BANK 1	<ul style="list-style-type: none"> • 6 hours have elapsed since ignition switch is OFF under a completely warmed up condition. • For models with block heater, at least 6 hours must have elapsed without operating the block heater.

Diagnostic procedure:

1. With the ignition switch ON (engine stopped), read the values in [Coolant Temp.] and [Intake Air Temp.].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
2. If the values from step 1) satisfy the following conditions, idle the engine for two minutes or more.

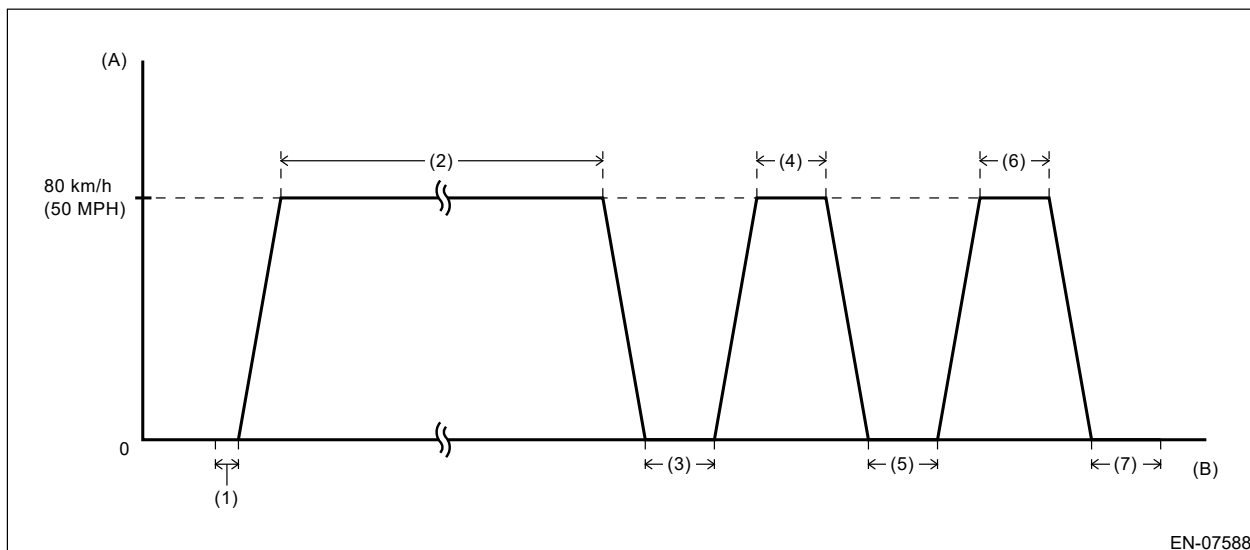
Condition:

|Engine coolant temperature – Intake air temperature| ≤ 5°C (9°F)

Note:

- If the conditions are not satisfied, turn the ignition switch to OFF and wait until the parameters are satisfied.
- Hold the select lever in "P" range or "N" range at idling.


3. Drive according to the drive pattern described below.



- (A) Vehicle speed (B) Elapsed time
- (1) Idle the engine for 2 minutes or more. (4) Drive for 30 seconds or more at a constant speed of 80 km/h (50 MPH) or more. (6) Drive for 30 seconds or more at a constant speed of 80 km/h (50 MPH) or more.
- (2) Drive for a total period of 15 minutes or more at a speed of 80 km/h (50 MPH) or more. (5) Stop the vehicle and idle for 30 seconds or more. (7) Stop the vehicle and idle for 30 seconds.
- (3) Stop the vehicle and idle for 30 seconds or more.

Note:

- In pattern (2), it is acceptable to decelerate to less than 80 km/h (50 MPH) or to stop the vehicle depending on the traffic conditions. Drive the vehicle at 80 km/h (50 MPH) or more until the total driving time reaches or exceeds 15 minutes.
- There is no given transition time between idling and cruising.
- Driving at constant speed only on a downhill causes smaller engine load and may result in failure to obtain a right diagnostic result.
- If the ignition switch is turned to OFF during driving cycle F, perform this driving cycle again after satisfying the conditions listed in the table.


4. Read the temporary code using the Subaru Select Monitor or general scan tool.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)

6. DRIVE CYCLE H

DTC	Item	Condition
P0071	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" RANGE/PERFORMANCE	<ul style="list-style-type: none"> • 6 hours have elapsed since ignition switch is OFF under a completely warmed up condition. • For models with block heater, at least 6 hours must have elapsed without


		operating the block heater.
P0116	ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE	<ul style="list-style-type: none"> • 6 hours have elapsed since ignition switch is OFF under a completely warmed up condition. • For models with block heater, at least 6 hours must have elapsed without operating the block heater.
P0196	ENGINE OIL TEMPERATURE SENSOR "A" RANGE/PERFORMANCE	<ul style="list-style-type: none"> • 6 hours have elapsed since ignition switch is OFF under a completely warmed up condition. • For models with block heater, at least 6 hours must have elapsed without operating the block heater.
P0451	EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT RANGE/PERFORMANCE	60 seconds have elapsed since ignition switch is OFF.
P050A	COLD START IDLE CONTROL SYSTEM PERFORMANCE	—
P050B	COLD START IGNITION TIMING PERFORMANCE	—

Diagnostic procedure:

1. With the ignition switch ON (engine stopped), read the values in [Coolant Temp.] and [Intake Air Temp.].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
2. If the values from step 1) satisfy the following conditions, idle the engine for two minutes or more.

Condition:
|Engine coolant temperature – Intake air temperature| ≤ 5°C (9°F)

Note:

 - **If the conditions are not satisfied, turn the ignition switch to OFF and wait until the parameters are satisfied.**
 - **Hold the select lever in "P" range or "N" range at idling.**
3. Read the temporary code using the Subaru Select Monitor or general scan tool.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)

7. DRIVE CYCLE I

DTC	Item	Condition
P0455	EVAP SYSTEM (CPC) LEAK DETECTED (LARGE LEAK)	Engine coolant temperature: 5 – 45°C
P0456	EVAP SYSTEM (CPC) LEAK DETECTED (VERY SMALL LEAK)	

P1451	EVAP SYSTEM CLOG DETECTED (PIPE)	(41 – 113°F)
P2402	EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT HIGH	Intake air temperature: 5 – 50°C (41 – 122°F)
P2404	EVAP SYSTEM LEAK DETECTION PUMP SENSE CIRCUIT RANGE/PERFORMANCE	
P2420	EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT HIGH	


Caution:

Be careful of the state of the battery when performing the drive cycle I consecutively. Performing the drive cycle I consecutively without the engine running may cause a low battery voltage and battery discharge.

Note:

- If it is necessary to perform drive cycle I consecutively, drive the vehicle under the following conditions to release accumulated evaporating gas. Performing the drive cycle I consecutively without starting the engine causes a large amount of evaporating gas to accumulate in the canister, which hinders an accurate diagnosis.
 - After engine is warmed up.
 - Drive for 10 minutes or more at a speed of 48 km/h (30 MPH) or more (duration of drive can be an accumulation)
- To obtain an accurate diagnostic result, perform the procedures according to the following points.
 - Do not refuel gas immediately before performing drive cycle I. There will be a large amount of evaporating gas immediately after refuel, which may cause a less accurate diagnostic performance.
 - Do not shake the vehicle while performing drive cycle I. Shaking the vehicle causes evaporating gas to increase inside the fuel tank, which may cause a less accurate diagnostic performance.
 - Do not perform any service operation including installation or removal of parts or connectors while performing drive cycle I. Performing service operation could affect on the functions of related parts, which may cause a less accurate diagnostic performance.
- Perform **MODE \$08** when using a general scan tool.

Diagnostic procedure:

1. Prepare the Subaru Select Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>General Description>PREPARATION TOOL.](#)
2. Prepare PC with Subaru Select Monitor installed.
3. Connect the USB cable to the DST-i and the USB port on the personal computer (dedicated port for the Subaru Select Monitor).

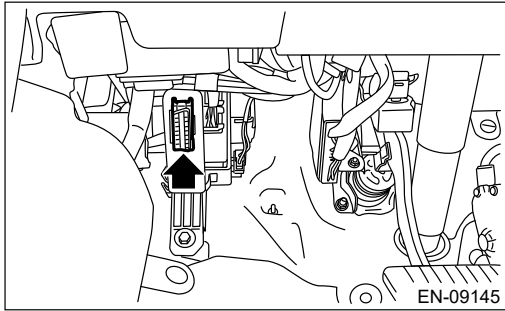
Note:

The dedicated port for the Subaru Select Monitor means the USB port which was used to install the Subaru Select Monitor.

4. Connect the diagnosis cable to DST-i.
5. Connect the DST-i to the data link connector located in the lower portion of the instrument panel (on the driver's side).

Caution:

Do not connect the scan tools except for Subaru Select Monitor and general scan tool.



6. Start the PC.
7. Turn the ignition switch to ON (engine OFF) and run the "PC application for Subaru Select Monitor".
8. On [Main Menu] display, select [Each System].
9. On [Select System] display, select [Engine Control System].
10. Click the [OK] button after the information of engine type has been displayed.
11. On the engine diagnosis display, select [Generic OBDII].
12. On the OBD menu display, select [Evaporative System Leak Test].
13. On [Evaporative System Leak Test] display, select [Evaporative System Leak Test].
14. On [Evaporative System Leak Test is running. Press Cancel to exit this function.] display, click [OK] button to perform evaporative system leak test.
15. When [Conditions have been enabled to control this function. Turn the ignition switch off to terminate the test.] display appears, wait for 30 minutes without clicking the [OK] button.

Caution:

Do not leave the vehicle for an extended period of time after the test is complete. This may cause early deterioration of the battery or discharged battery.

Note:

- Clicking the [OK] button brings [Evaporative System Leak Test] display back, although the test is continuing.
- The Subaru Select Monitor screen does not change after the evaporative system leak test is complete or when the test is aborted by turning off the ignition switch.
- If "Test conditions are not correct" display appears, use Subaru Select Monitor to check that the values in [Coolant Temp.] and [Intake Air Temp.] satisfy the conditions. If the conditions are satisfied, make the necessary preparation for the drive cycle again. Ref. to Target Not Found

16. After 30 minutes passed from the start of step 14), click the [OK] button to return to the [Evaporative System Leak Test] display.
17. Return to the OBD menu display, and select [On-board monitor test result].
18. Check TID \$C1 —\$CA of MID \$3C in [On-board monitor test result].


Note:

Perform MODE \$06 and check when using a general scan tool.

Result of on-board monitor test

Display	Details	Remarks
\$0000 is stored in all Val.	During the evaporative system leak test, the test conditions were not met and the test was canceled.	Once the test conditions are met, perform the test again.
All Val. are stored with values and OK is set to all the results.	Evaporative system leak test is completed correctly.	While the ignition switch is ON, read the pending code using the Subaru Select Monitor.
Some results were no good.	The evaporative system leak	While the ignition switch is ON,

	test completed successfully but the results were faulty.	read the pending code using the Subaru Select Monitor.
--	--	--

- 19.** When the evaporative system leak test is completed correctly, read the pending code with the ignition switch turned to ON position. If the DTC is recorded, check the appropriate DTC.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)


Note:

- **Perform MODE \$07 when using a general scan tool.**
- **The pending code will be cleared by turning ignition switch to OFF.**

8. DRIVE CYCLE J

DTC	Item	Condition
P2610	ECM/PCM ENGINE OFF TIMER PERFORMANCE	—

Diagnostic procedure:

1. Idle the engine for 15 minutes or more.
2. Turn the ignition switch to OFF.
3. After at least 10 hours passed from the start of step 2), read the temporary code using the Subaru Select Monitor or general scan tool.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)

9. DRIVE CYCLE N


DTC	Item	Condition
P0016	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR A	Coolant temperature: 80°C (176°F) or more
P0018	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR A	

Warning:

When performing drive cycle N on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

1. Check the data in condition column of table by using the Subaru Select Monitor or general scan tool.

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
 - **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.
2. While the conditions in the list are satisfied, race the engine at the speed of approx. 2500 rpm for 40 seconds or more.
 3. Start to move the vehicle, then accelerate the vehicle to 50 km/h (31.1 MPH) or more.
 4. When the speed reaches 50 km/h (31.1 MPH) or more, release the accelerator pedal, the brake pedal and the clutch pedal (MT model) to decelerate the vehicle without shifting the gear. At this time, select an appropriate gear beforehand so that the engine speed falls within the range from 2500 rpm to 1900 rpm for 5 seconds or more.

Note:

- The vehicle speed does not matter so long as the engine speed can maintain from 2500 rpm to 1900 rpm for 5 seconds or more.
Example: On a downhill grade, it can be performed with a low speed gear and at a low vehicle speed.
- When it is performed with the electrical load such as the air conditioner, etc. turned OFF or the vehicle driven on a downhill grade, the engine speed decreases slowly. Therefore, the continuous time can be maintained easily.


5. Bring the vehicle to a stop in a safe place, and idle it for 5 minutes or more.

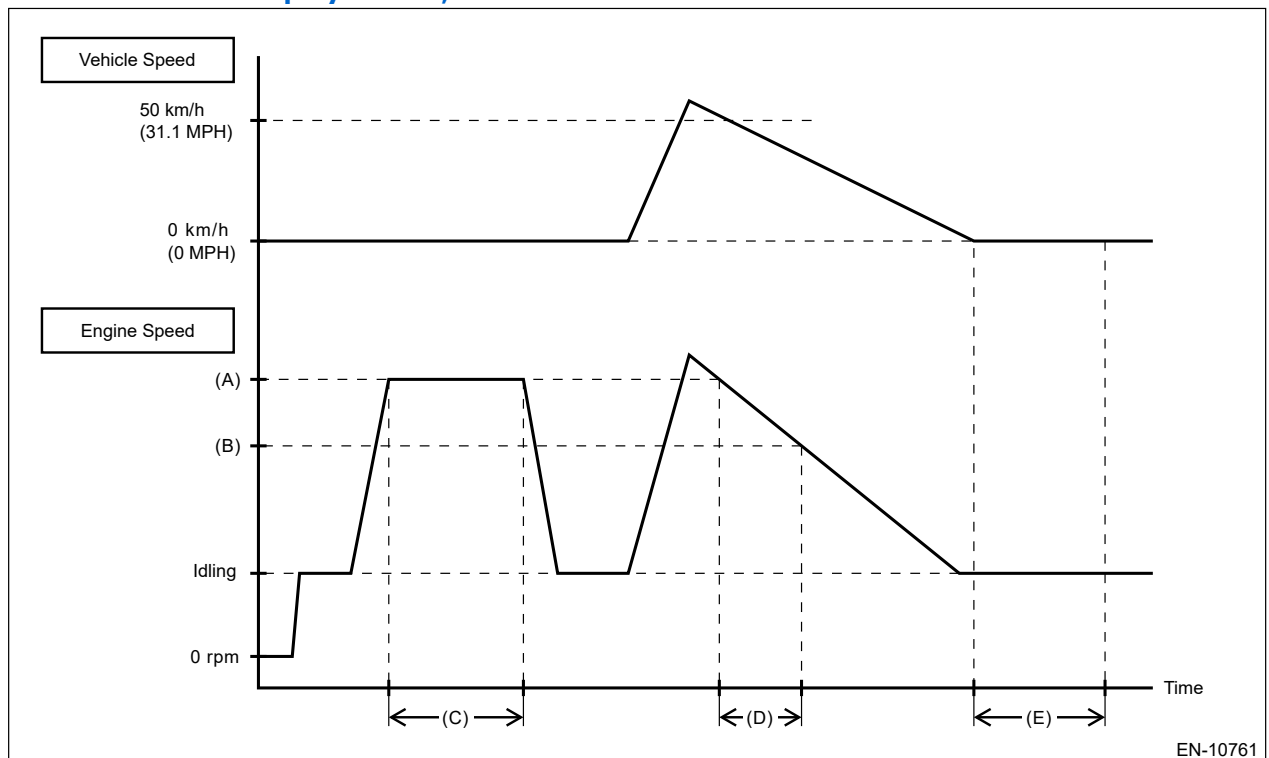
Note:

Driving method while vehicle is driven to a stop at safe place is not restricted.

6. With the vehicle idling, read the temporary diagnostic code of DTC using Subaru Select Monitor or general scan tool.

Note:

- Refer to "Read Diagnostic Trouble Code (DTC)" for detailed operation procedure. 
- Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Read Diagnostic Trouble Code (DTC).
- In the step 6), if the DTC is not displayed on the Subaru Select Monitor or general scan tool display screen, the trouble is resolved.



(A) 2500 rpm

(B) 1900 rpm

(C) 40 seconds or more

(D) 5 seconds or more

(E) 5 minutes or more

10. DRIVE CYCLE O

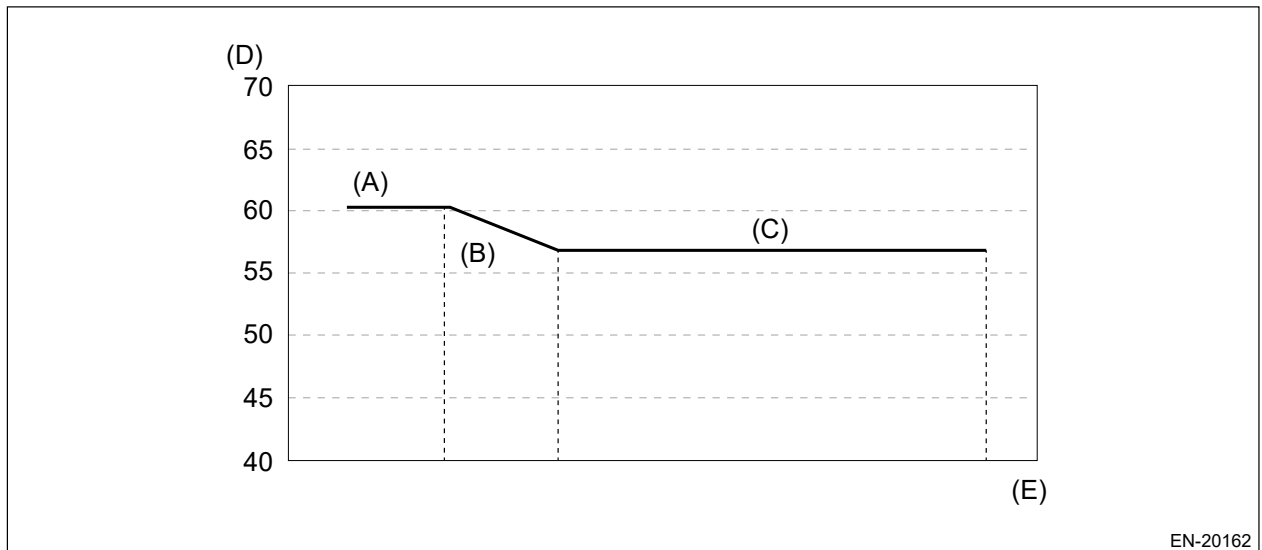
DTC	Item	Condition
P0441	EVAP SYSTEM (CPC) INCORRECT PURGE FLOW	—

Diagnostic procedure:

Warning:

When performing drive cycle O on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

1. Drive according to the drive pattern described below.



- | | | |
|--|--|----------|
| (A) Drive the vehicle at 60 km/h (37 MPH) or faster for at least 5 minutes in fully warm-up condition. | (C) Drive the vehicle at a constant vehicle speed by depressing the accelerator pedal for at least 30 seconds. | (E) Sec. |
| (B) Decelerate with the throttle fully closed for at least 3 seconds. | (D) Vehicle speed km/h (MPH) | |

2. Park the vehicle on a safe place.

Note:

Driving method while vehicle is driven to a stop at safe place is not restricted.

3. With the vehicle idling, read the temporary diagnostic code of DTC using Subaru Select Monitor or general scan tool.

Note:

- For detailed operation procedures, refer to "Read Diagnostic Trouble Code (DTC)". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)
- In the step 3), if the DTC is not displayed on the Subaru Select Monitor or general scan tool display screen, the trouble is resolved.

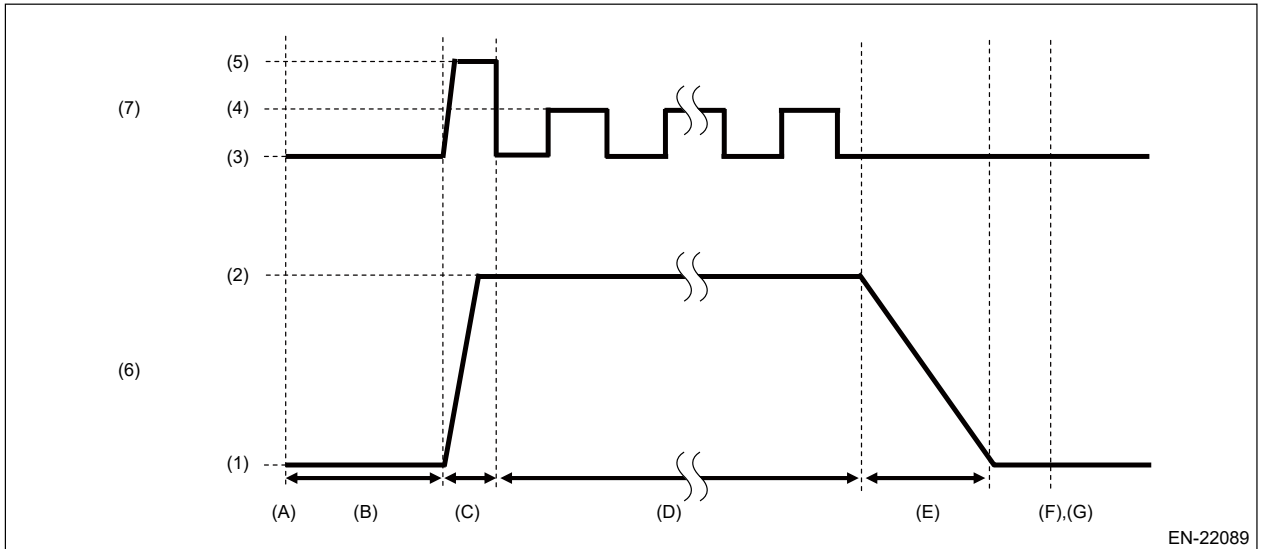
11. DRIVE CYCLE T

Warning:


When performing the drive cycle T on the public road, be very careful of the traffic condition and the safe driving must be the high priority.

Diagnostic procedure:

1. Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 L (5.3—10.6 US gal, 4.4—8.8 Imp gal)].
2. Using the Subaru Select Monitor, clear the memory of [Engine Control System]. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)
3. Drive according to the drive pattern described below.



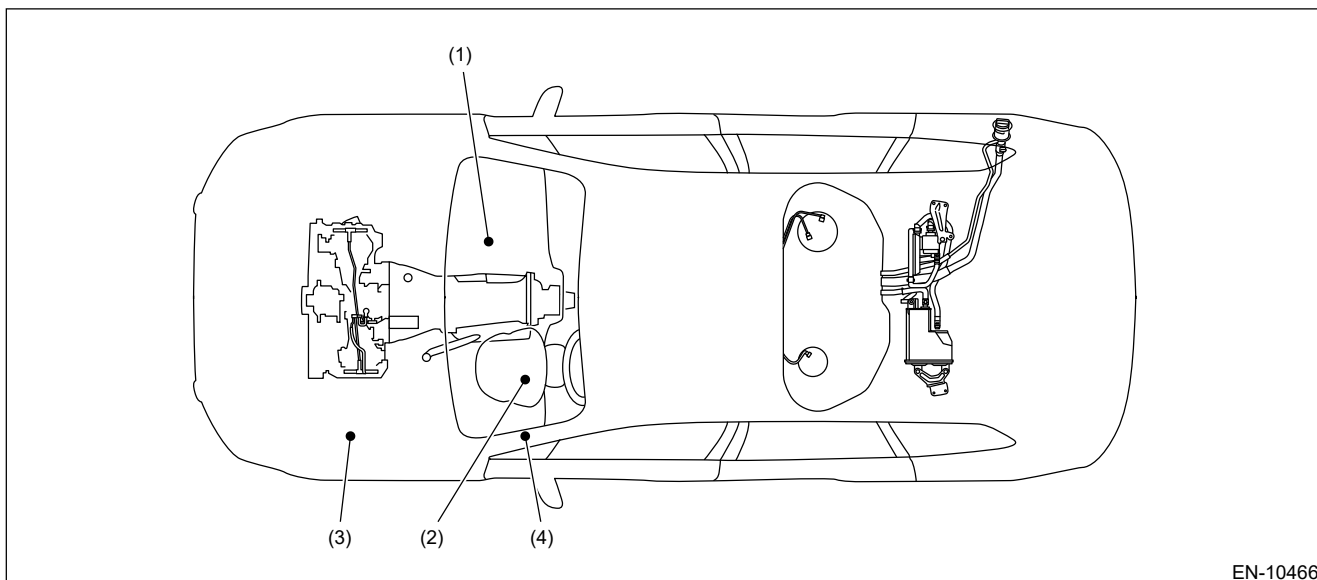
- | | | |
|---|--|-------------------------------------|
| (1) 0 km/h (0 MPH) | (4) 20% | (6) Vehicle speed |
| (2) 60 km/h (37.3 MPH) | (5) 30 – 60% | (7) Accelerator pedal opening angle |
| (3) 0% | | |
| (A) Start the engine after warming up (coolant temperature of 70°C (°F)). | (D) While maintaining vehicle speed at 60 km/h (37.3 MPH), repeat the accelerator opening angle 0% (5 seconds) ↔ 20% (5 seconds) for 20 minutes or more. | (G) Stop the engine. |
| (B) Idle the engine for at least three minutes. | (E) Fully release the accelerator pedal to decelerate the vehicle for at least 5 seconds. | |
| (C) Accelerate the vehicle to 60 km/h (37.3 MPH). | (F) Stop the vehicle. (Driving method while vehicle is driven to a stop at safe place is not restricted) | |

4. Read the temporary code using the Subaru Select Monitor or general scan tool.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)

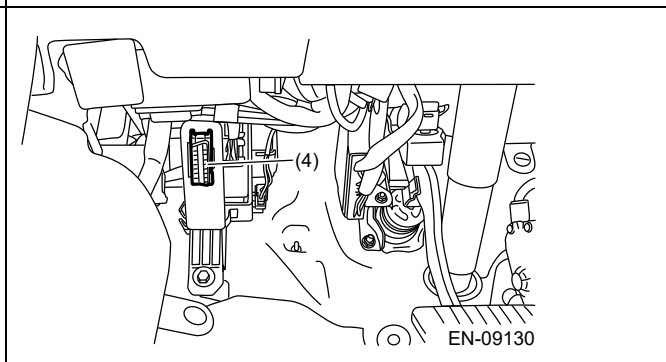
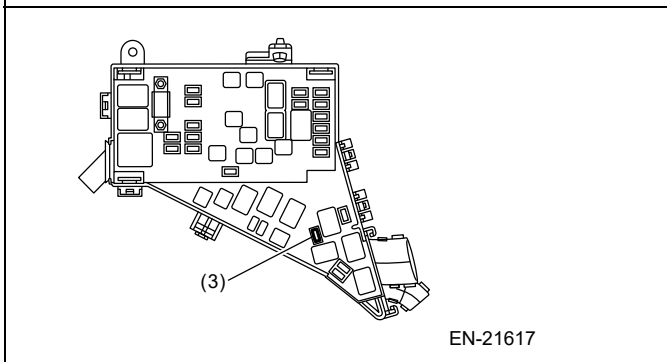
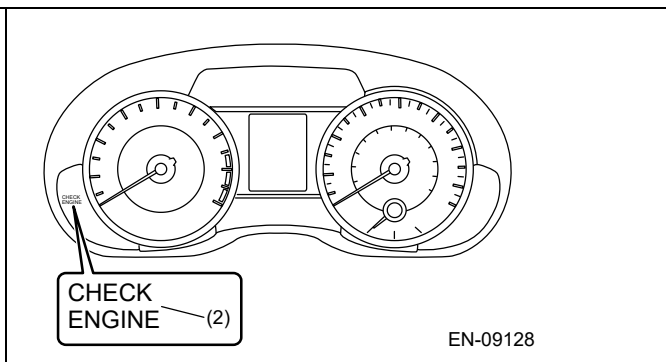
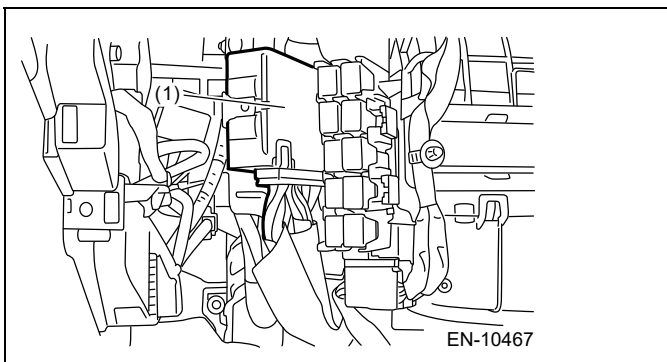
ENGINE (DIAGNOSTICS)(H4DO) > Electrical Component Location

LOCATION

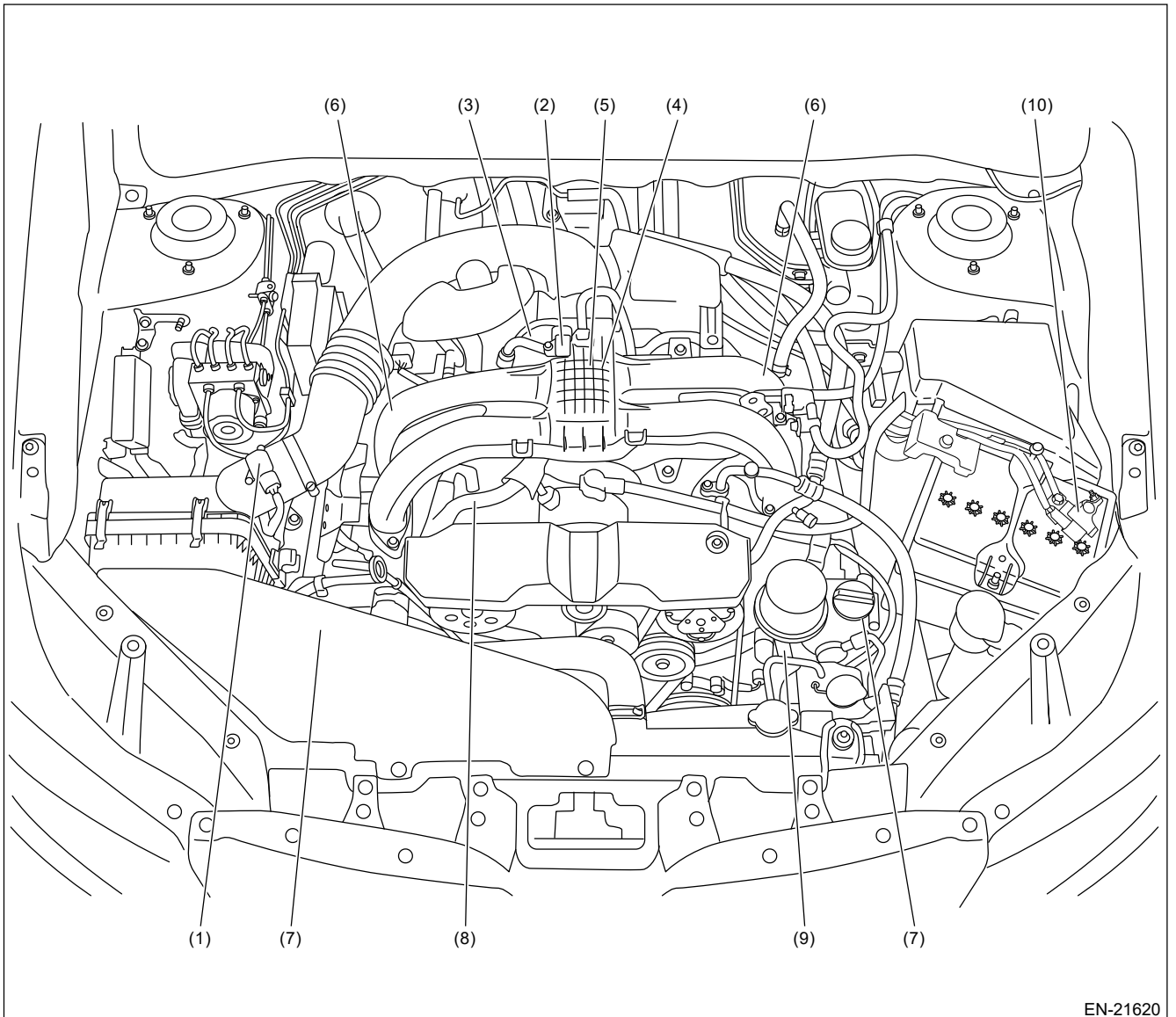
1. CONTROL MODULE



- (1) Engine control module (ECM)
- (2) Malfunction indicator light
- (3) Delivery mode fuse
- (4) Data link connector

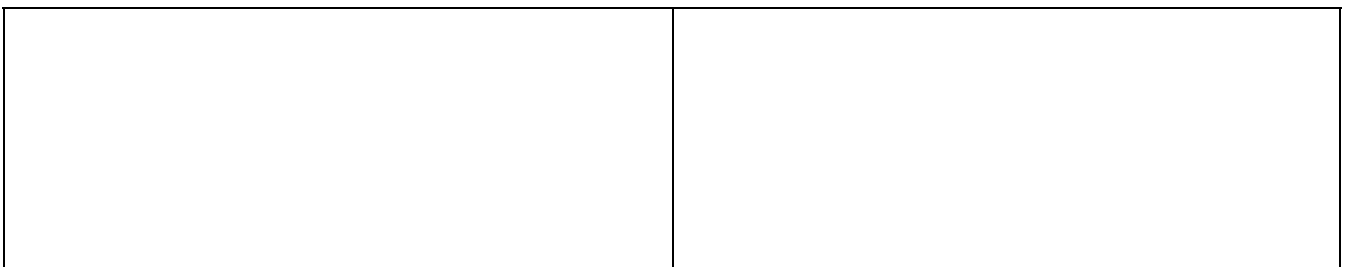


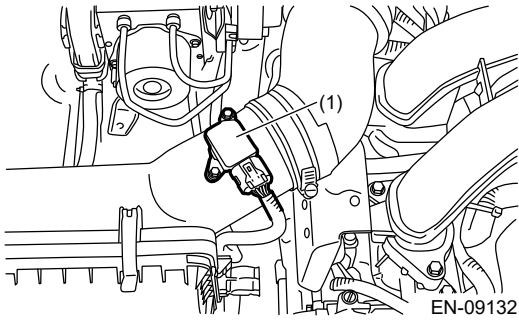
2. SENSOR



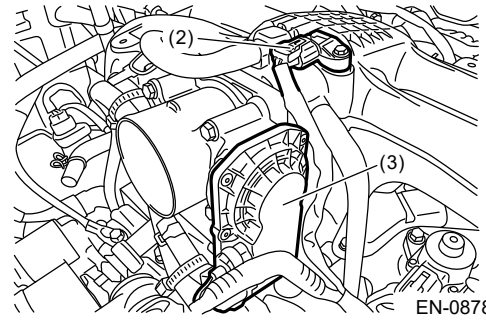
EN-21620

- | | | |
|---|---|-----------------------------------|
| (1) Mass air flow and intake air temperature sensor | (5) Crankshaft position sensor | (9) Engine oil temperature sensor |
| (2) Manifold absolute pressure sensor | (6) Tumble generator valve actuators (with built-in opening angle switch) | (10) Battery status sensor |
| (3) Electronic throttle control | (7) Intake camshaft position sensor | |
| (4) Knock sensor | (8) Engine coolant temperature sensor | |

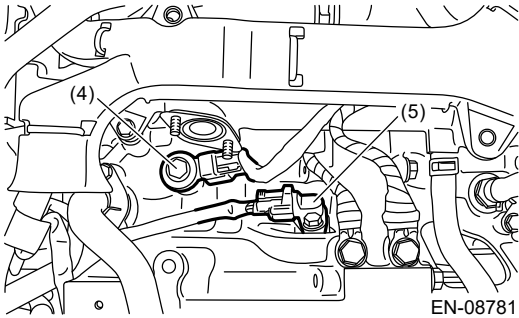




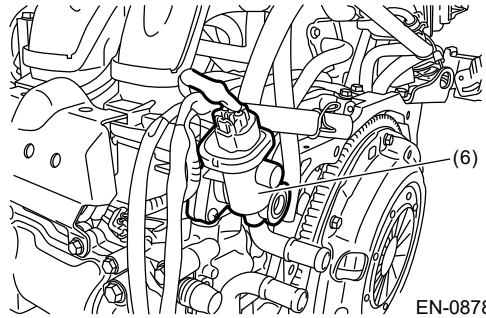
EN-09132



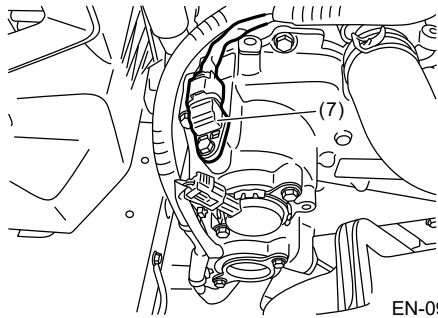
EN-08780



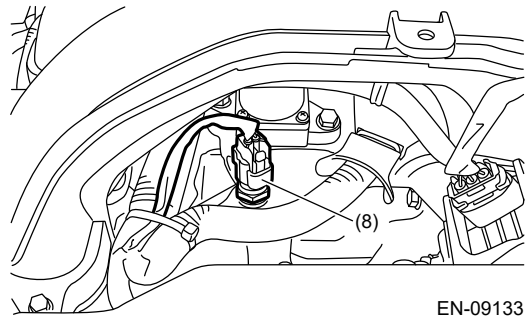
EN-08781



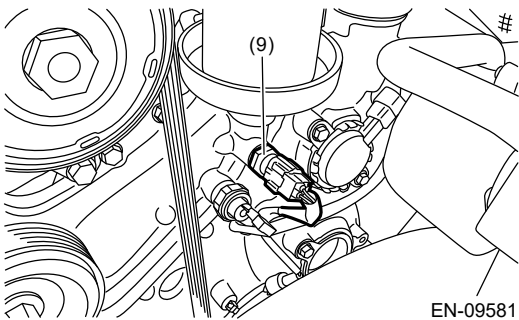
EN-08782



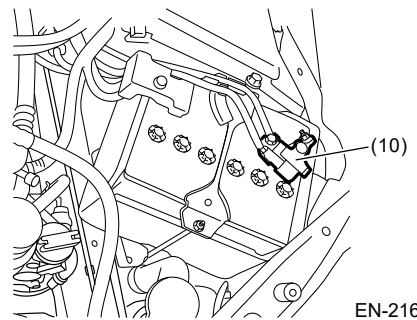
EN-09579



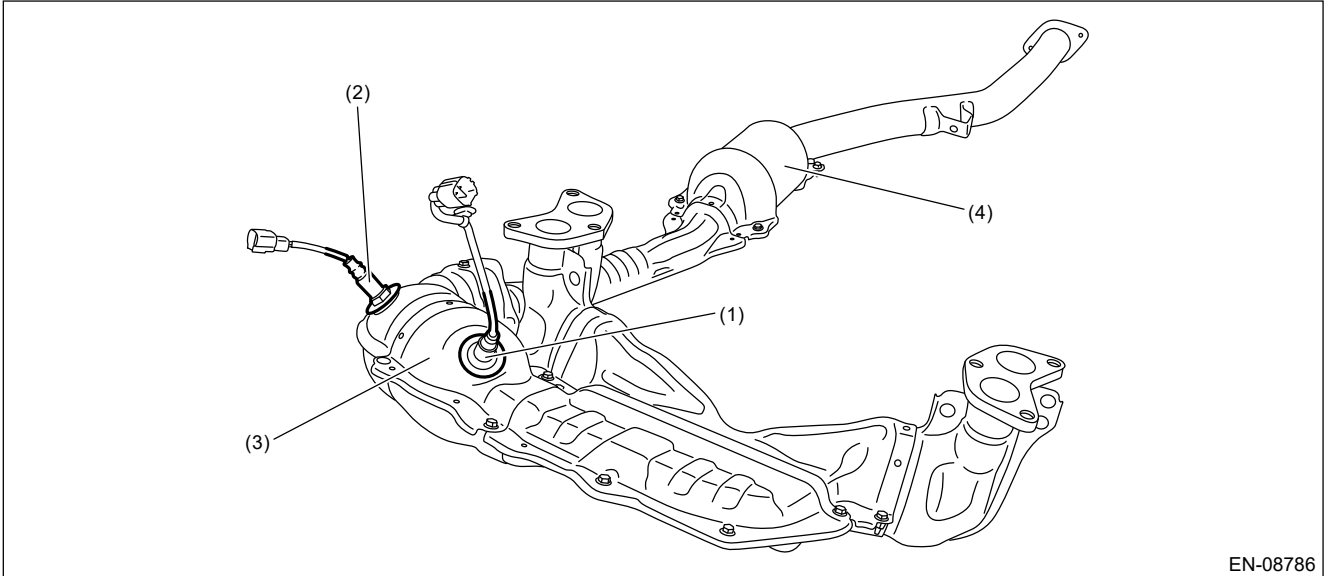
EN-09133



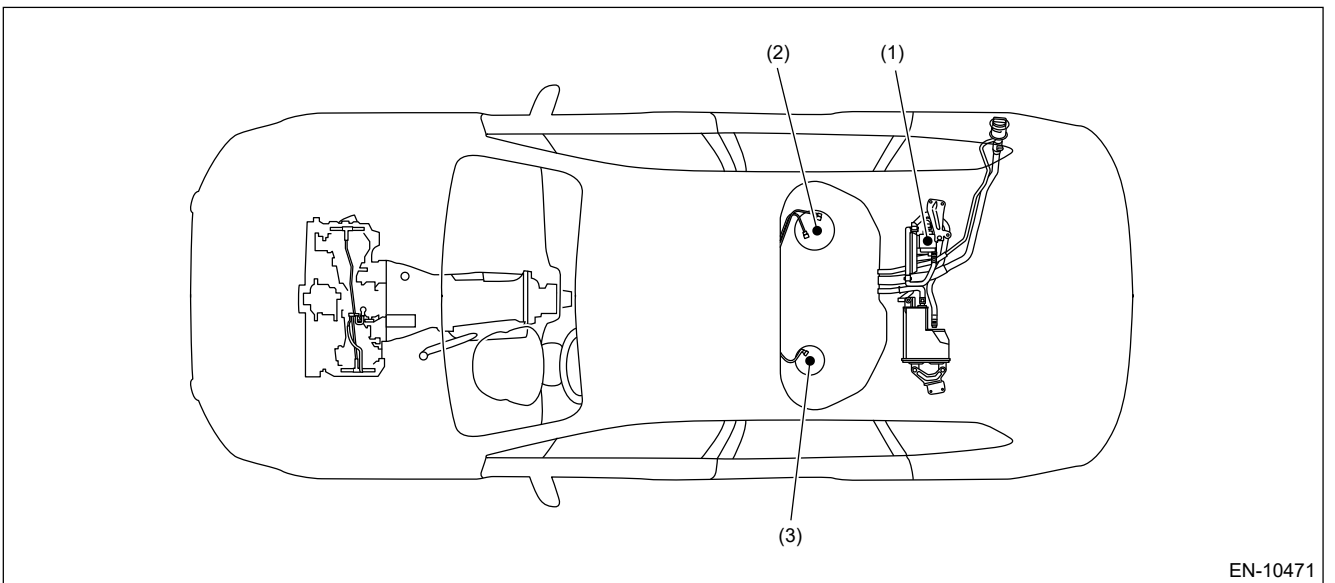
EN-09581



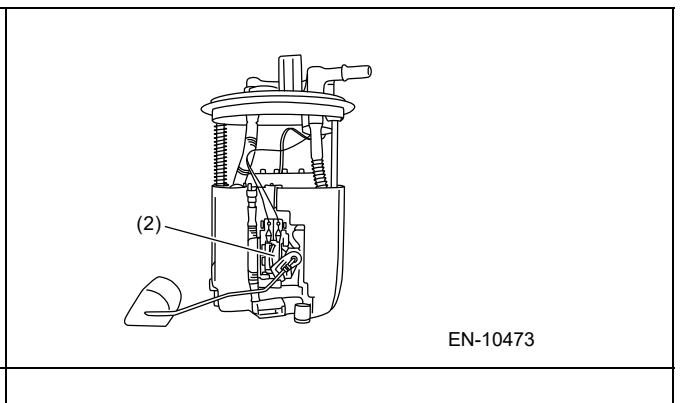
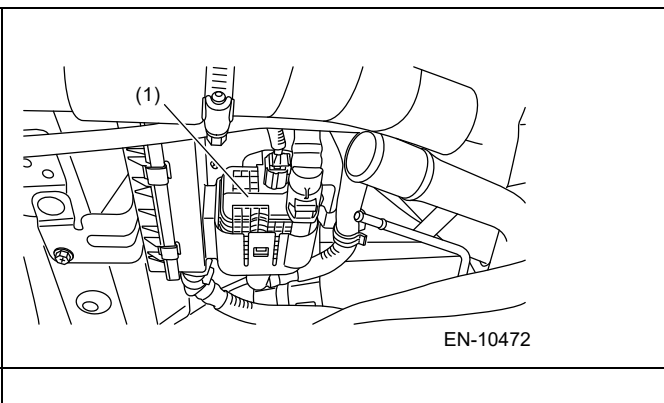
EN-21622

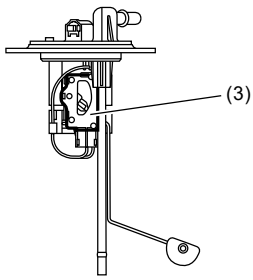


- (1) Front oxygen (A/F) sensor
- (2) Rear oxygen sensor
- (3) Front catalytic converter
- (4) Rear catalytic converter



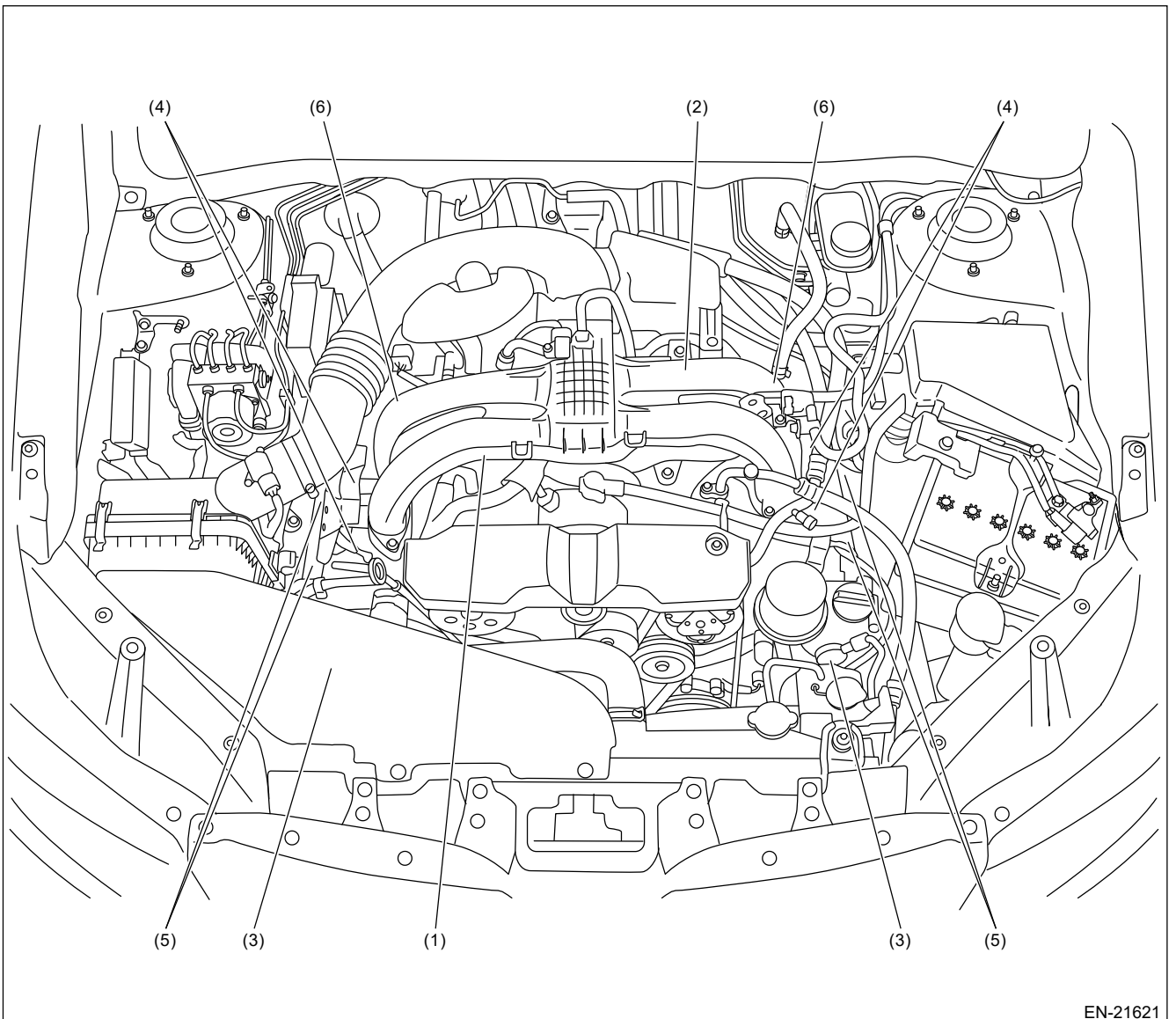
- (1) Leak check valve ASSY (with built-in pressure sensor)
- (2) Fuel level sensor
- (3) Fuel sub level sensor





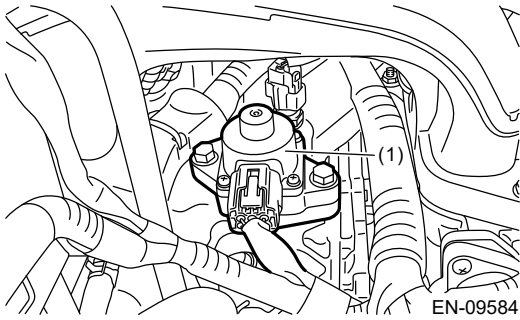
EN-08790

3. SOLENOID VALVE, ACTUATOR, EMISSION CONTROL SYSTEM PARTS AND IGNITION SYSTEM PARTS

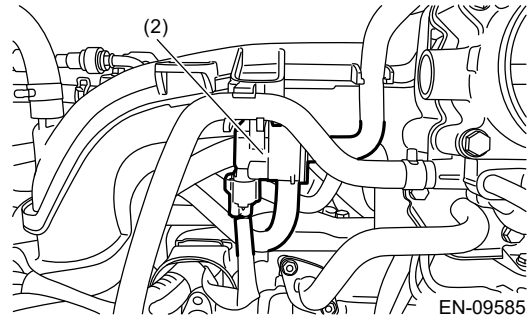


EN-21621

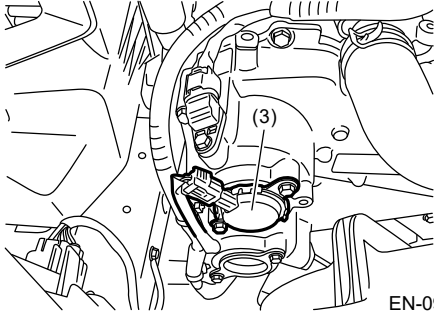
- | | | |
|----------------------------------|---------------------------------|-------------------------------------|
| (1) EGR control valve | (3) Intake oil control solenoid | (5) Ignition coil |
| (2) Purge control solenoid valve | (4) Fuel injector | (6) Tumble generator valve actuator |



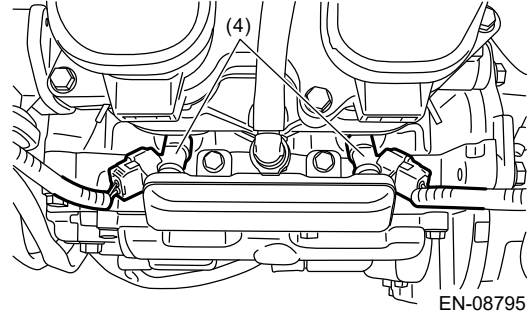
EN-09584



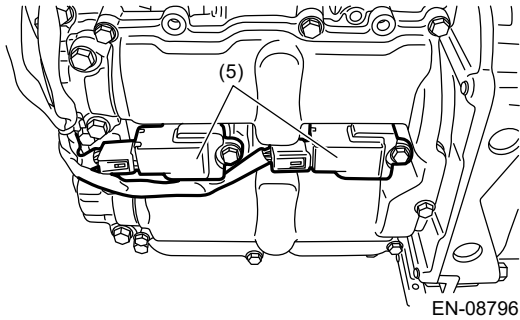
EN-09585



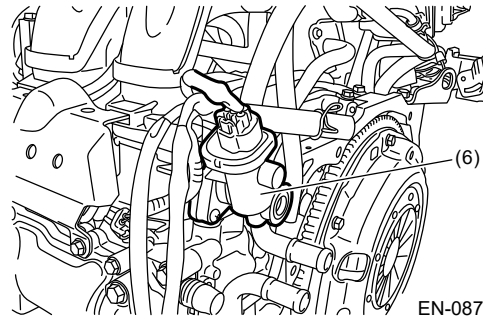
EN-09586



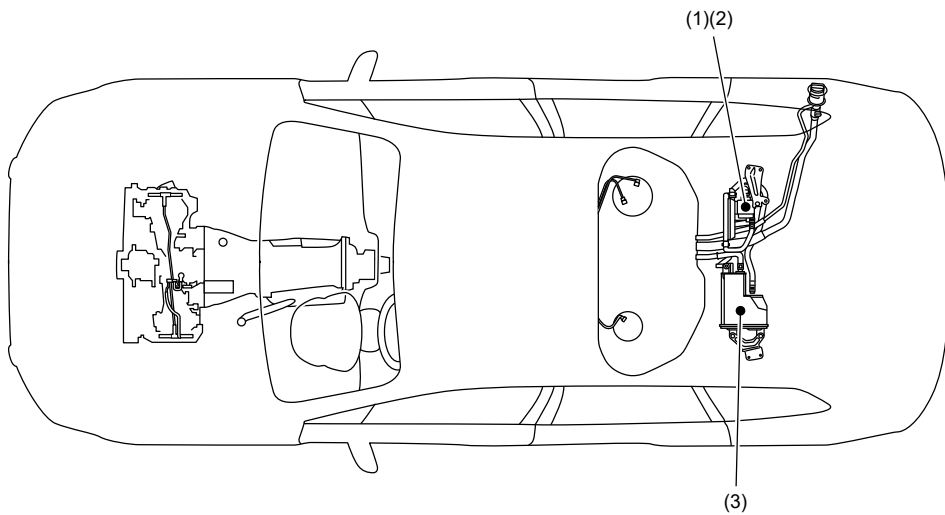
EN-08795



EN-08796



EN-08782

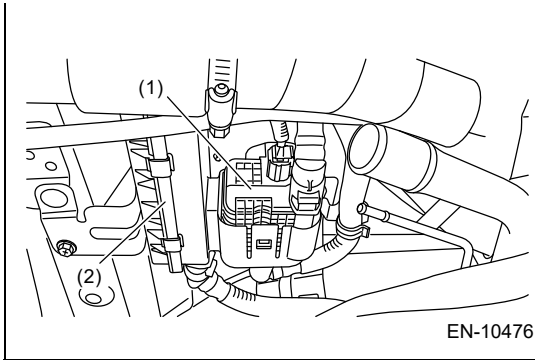


EN-10475

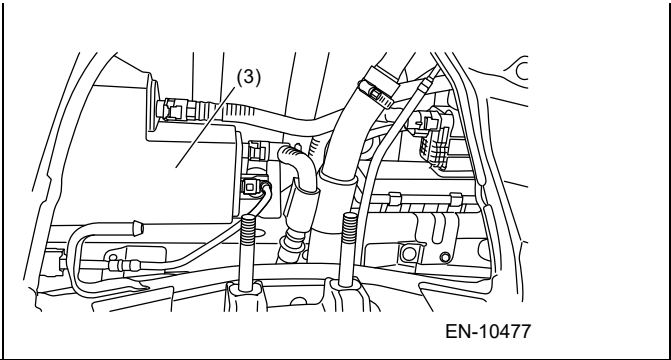
(1) Leak check valve ASSY

(2) Drain filter

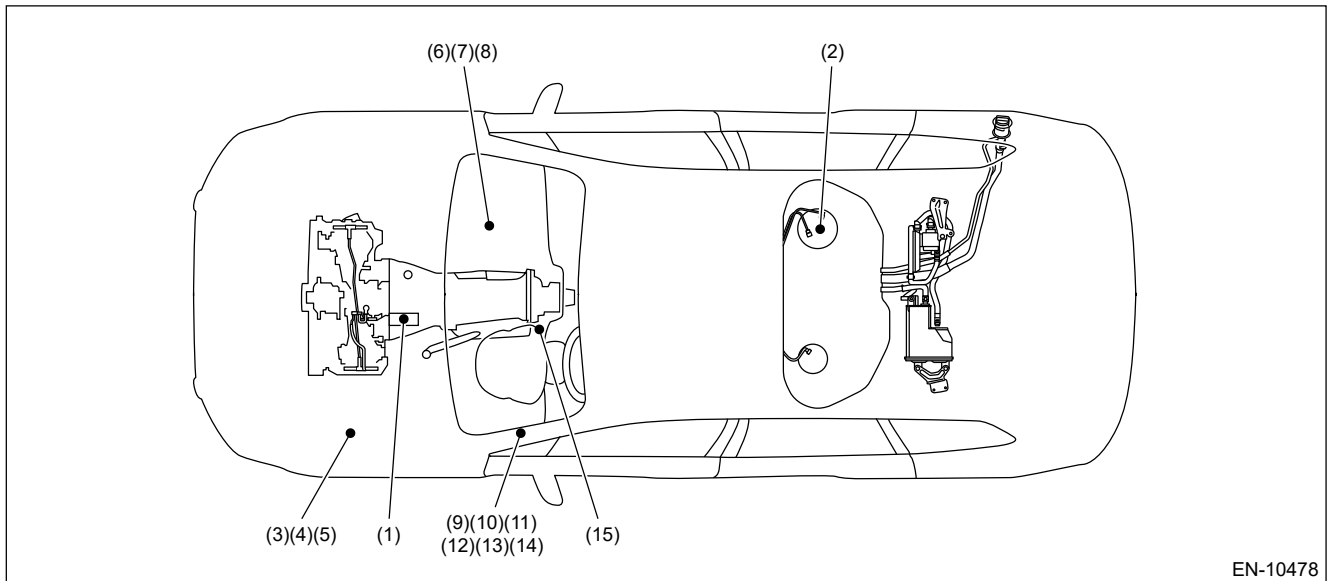
(3) Canister



EN-10476

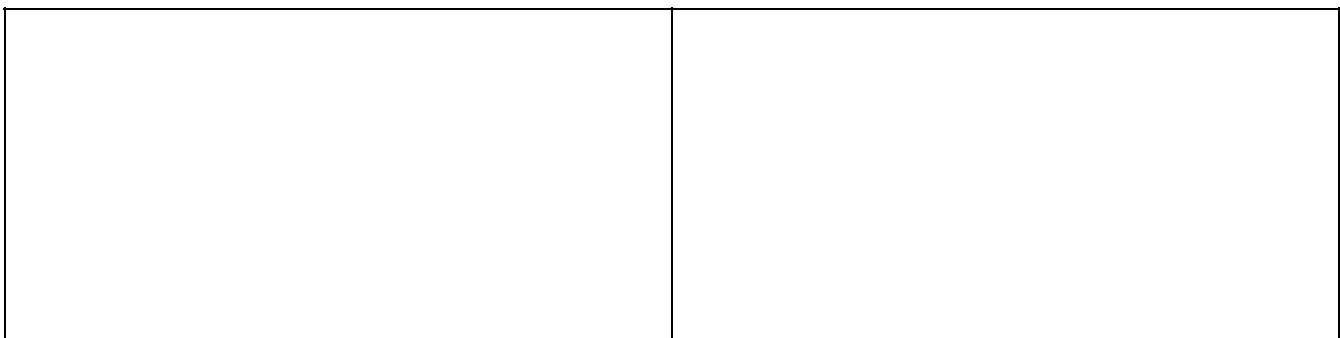


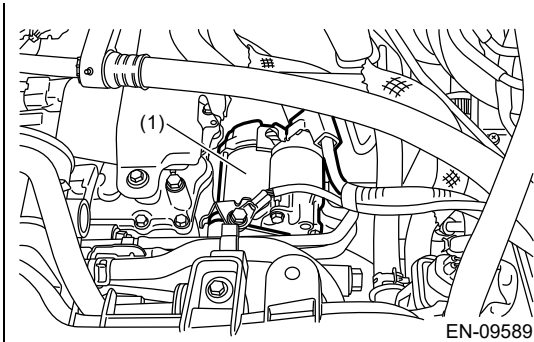
EN-10477



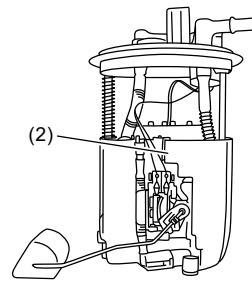
EN-10478

- | | | |
|-------------------------------|--|---|
| (1) Starter | (6) Main relay | (11) Starter relay |
| (2) Fuel pump | (7) IG relay | (12) Starter cut relay (model with push button start) |
| (3) Radiator main fan relay 1 | (8) Fuel pump relay | (13) IG relay 1 (push button start) (model with push button start) |
| (4) Radiator main fan relay 2 | (9) A/F, oxygen sensor relay | (14) Starter relay (push button start) (model with push button start) |
| (5) Radiator sub fan relay | (10) Electronic throttle control relay | (15) Push button ignition switch (model with push button start) |

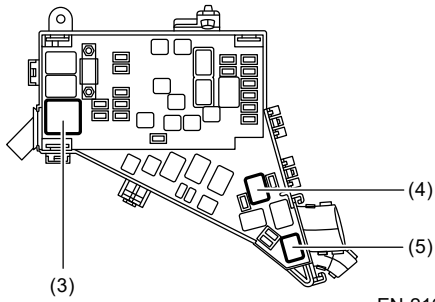




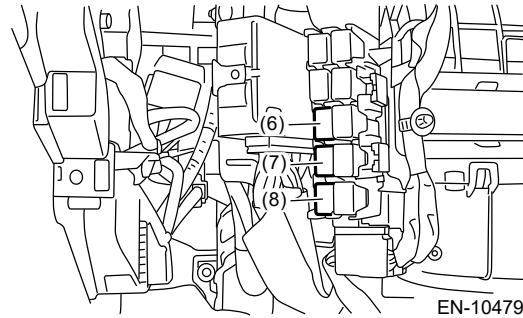
EN-09589



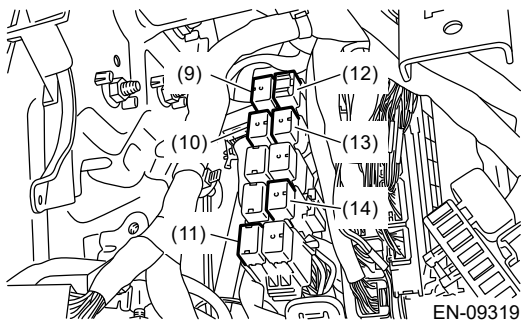
EN-10186



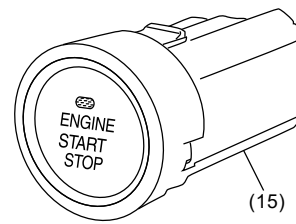
EN-21618



EN-10479

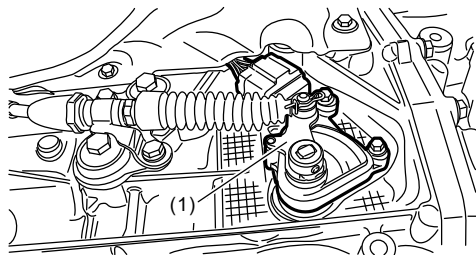


EN-09319

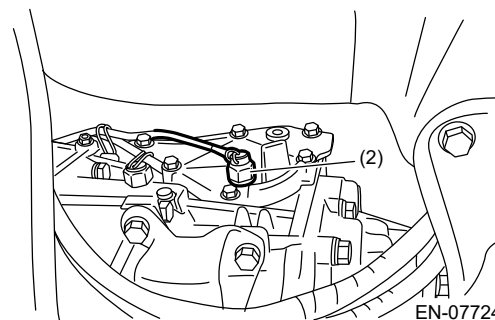


EN-09321

4. TRANSMISSION



EN-09591



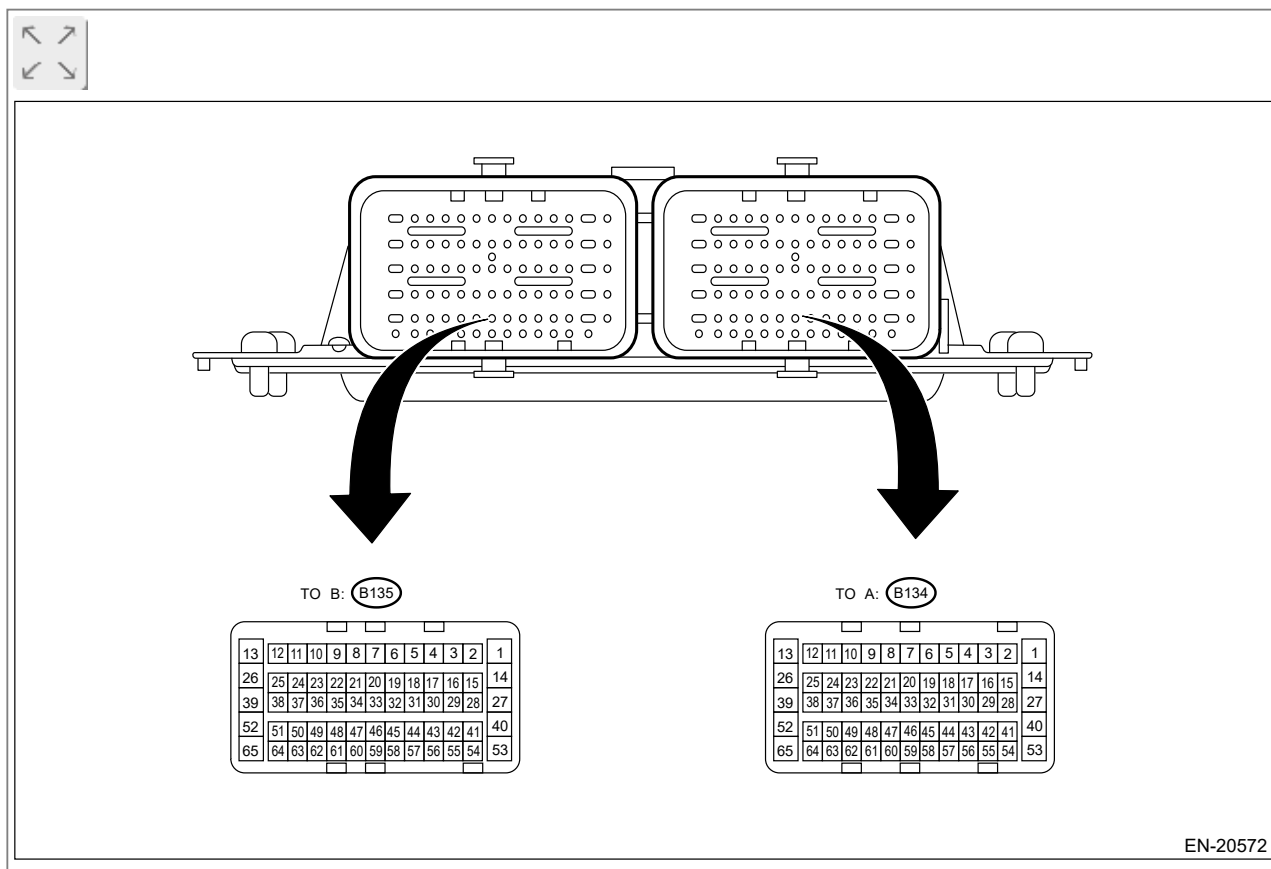
EN-07724

(1) Inhibitor switch (CVT model)

(2) Neutral position switch (MT model)

ENGINE (DIAGNOSTICS)(H4DO) > Engine Control Module (ECM) I/O Signal

ELECTRICAL SPECIFICATION



Description	Connect or No.	Terminal No.	Signal (V)		Note	
			Ignition SW ON After warm-up (at engine OFF)	Engine ON After warm-up (at idle)		
Crankshaft position sensor	(+) signal	B135	40	0 or 5	0 or 5	Waveform 1, 8 and 9
	(-) signal	B135	27	0	0	—
	Power supply	B135	28	5	5	—
Intake camshaft position sensor RH	B135	54	0 or 5	0 or 5	0 or 5	Waveform 1
Intake camshaft position sensor LH	B135	41	0 or 5	0 or 5	0 or 5	Waveform 1
Camshaft position sensor ground	B135	42	0	0	0	—
Front oxygen (A/F) sensor	(+) signal	B135	46	2.8—3.2	2.8—3.2	Waveform 2
	(-) signal	B135	33	1.3—3.1	2.4—2.7	Waveform 2

	Heater signal	B135	5	Battery voltage	0 or battery voltage	Waveform 4
Rear oxygen sensor	(+) signal	B135	57	0.1—0.3	0.2—2.1	Waveform 3
	(-) signal	B135	56	1.4—1.5	1.1—1.7	Waveform 3
	Heater signal	B135	10	Battery voltage	0 or battery voltage	Waveform 4
Oxygen sensor shield		B135	58	0	0	—
Air flow sensor	Signal	B134	16	0.6— 1	0.3—4.5	—
	Ground	B134	17	0	0	—
	Shield	B134	3	0	0	—
Intake air temperature sensor signal		B134	15	0.3—4.6	0.3—4.6	—
Engine coolant temperature sensor signal		B135	43	1 —1.4	1 —1.4	—
Engine oil temperature sensor signal		B135	18	1 —1.4	1 —1.4	—
Manifold absolute pressure sensor signal		B135	15	3.5—4.8	1.4—2.1	—
Knock sensor	Signal	B135	30	2.4—2.6	2.1—2.8	—
	Shield	B135	17	0	0	—
Accelerator pedal position sensor	Main signal	B134	29	Fully closed: 0.3—1.1 Fully open: 2.3—3.8	Fully closed: 0.3—1.4 Fully open: 2.4—3.8	Waveforms 2, 3, 5 and 6
	Main power supply	B134	30	5	5	—
	Main ground	B134	33	0	0	—
	Sub signal	B134	31	Fully closed: 0.3—1.1 Fully open: 2.3—3.8	Fully closed: 0.3—1.4 Fully open: 2.3—3.8	—
	Sub power supply	B134	28	5	5	—
	Sub ground	B134	34	0	0	—
Tumble generator valve RH	Position signal	B135	47	Waveform	Waveform	Waveform 5
	Motor	B135	52	Waveform	Waveform	Waveform 5

	open					
	Motor closed	B135	13	Waveform	Waveform	Waveform 5
Tumble generator valve LH	Position signal	B135	59	Waveform	Waveform	Waveform 6
	Motor open	B135	26	Waveform	Waveform	Waveform 6
	Motor closed	B135	39	Waveform	Waveform	Waveform 6
Intake oil control solenoid RH		B135	20	Battery voltage	0 or battery voltage	Waveform 7
Intake oil control solenoid LH		B135	6	Battery voltage	0 or battery voltage	Waveform 7
Purge control solenoid valve		B135	51	Battery voltage	Battery voltage	When in operation: Waveform 11
Leak check valve assembly	Switching valve	B134	61	Battery voltage	Battery voltage	Operating: 0
	Pressure sensor	B134	21	1 – 4	1 – 4	When ignition switch is turned to ON: atmospheric pressure
	Vacuum pump	B134	9	Battery voltage	Battery voltage	Operating: 0
Ignition control	#1	B135	37	0	0 or 5	Waveform 8
	#2	B135	35	0	0 or 5	Waveform 8
	#3	B135	38	0	0 or 5	Waveform 8
	#4	B135	36	0	0 or 5	Waveform 8
Fuel injector	#1	B135	23	Battery voltage	0 or battery voltage	Waveform 9
	#2	B135	8	Battery voltage	0 or battery voltage	Waveform 9
	#3	B135	9	Battery voltage	0 or battery voltage	Waveform 9
	#4	B135	22	Battery voltage	0 or battery voltage	Waveform 9
EGR control valve	Signal 1	B135	12	0 or battery voltage	0 or battery voltage	—
	Signal 2	B135	48	0 or battery voltage	0 or battery voltage	—
	Signal 3	B135	25	0 or battery voltage	0 or battery voltage	—
	Signal 4	B135	49	0 or battery voltage	0 or battery voltage	—
Electronic throttle control	Main signal	B135	29	Approx. 0.7	Approx. 0.6—1.2	Fully closed: Approx. 0.6—1.2

						Fully open: Approx. 3.8—4.4 Waveform
	Sub signal	B135	31	Approx. 1.6	Approx. 1.5— 1.7	Fully closed: Approx. 1.4— 2 Fully open: Approx. 4 —4.6
	Shield	B135	19	0	0	—
	Motor (+)	B135	14	0 or battery voltage	0 or battery voltage	Drive frequency: 500 Hz
	Motor (-)	B135	1	Duty waveform	Duty waveform	Drive frequency: 500 Hz
Electronic throttle control motor power supply		B134	13	Battery voltage	Battery voltage	—
Electronic throttle relay control		B134	65	ON: 0	ON: 0	—
Self-shutoff relay control		B134	60	0	0	—
Starter relay control		B134	62	Waveform	Waveform	Models without push button start: Waveform 10
Starter cut relay control		B134	49	Waveform	Waveform	—
Fuel pump relay control		B134	63	Battery voltage	0	ON: 0 OFF: Battery voltage
A/C relay		B134	50	Battery voltage	Battery voltage	ON: 0
A/C switch		B134	47	ON: Battery voltage OFF: 0	ON: Battery voltage OFF: 0	Manual A/C model
Blower fan switch		B134	43	ON: 0 OFF: Battery voltage	ON: 0 OFF: Battery voltage	Manual A/C model
Main fan relay control		B134	51	Battery voltage	Battery voltage	ON: 0
Sub fan relay control		B134	37	Battery voltage	Battery voltage	ON: 0
Ignition switch		B134	2	Battery voltage	Battery voltage	—
Neutral position switch		B134	5	ON: 0 OFF: Battery voltage	ON: 0 OFF: Battery voltage	—
Delivery mode switch		B134	6	Battery voltage	Battery voltage	When fuse is installed: 0
Oil level switch		B135	3	0	0	Oil level LOW: 10 — 14
Clutch switch		B134	42	When clutch pedal is depressed: 0 When clutch pedal is released:	When clutch pedal is depressed: 0	MT model

			Battery voltage	When clutch pedal is released: Battery voltage	
Starter switch	B134	46	Waveform	Waveform	Models without push button start: Waveform 10 Models with push button start: Waveform
Starter switch 2	B134	58	Waveform	Waveform	Models without push button start: Waveform
Accessory cut request	B134	64	Waveform	Waveform	—
Engine speed output	B134	10	0	0 or battery voltage	Waveform
A/C middle pressure switch	B134	57	ON: 0 OFF: Battery voltage	ON: 0 OFF: Battery voltage	—
Brake switch 1 (Brake switch)	B134	59	When brake pedal is depressed: 0 When brake pedal is released: Battery voltage	When brake pedal is depressed: 0 When brake pedal is released: Battery voltage	—
Brake switch 2 (Stop light switch)	B134	48	When brake pedal is depressed: Battery voltage When brake pedal is released: 0	When brake pedal is depressed: Battery voltage When brake pedal is released: 0	—
Cruise control main switch	B134	44	ON: 0 OFF: 5	ON: 0 OFF: 5	Model without EyeSight (with cruise control)
Cruise control command switch	B134	22	When operating nothing: 3.5—4.5 When operating RES/ACC: 2.5—3.5 When operating SET/COAST: 0.5—1.5 When operating CANCEL: 0 —0.5	When operating nothing: 3.5—4.5 When operating RES/ACC: 2.5—3.5 When operating SET/COAST: 0.5—1.5 When operating CANCEL: 0 —0.5	Model without EyeSight (with cruise control)

LIN communication		B134	55	—	—	—
Immobilizer communication		B134	38	—	—	—
CAN communication	HI	B134	25	—	—	—
	LO	B134	24	—	—	—
Control module power supply		B134	1	Battery voltage	Battery voltage	—
		B134	14	Battery voltage	Battery voltage	—
Backup power supply		B134	27	Battery voltage	Battery voltage	Ignition switch OFF: Battery voltage
Sensor power supply		B134	35	5	5	—
		B135	32	5	5	—
Ground	Body	B134	53	0	0	—
	Sensor	B134	32	0	0	—
		B135	34	0	0	—
	Engine 1	B135	65	0	0	—
	Engine 2	B135	64	0	0	—
	Engine 3	B135	63	0	0	—
	Engine 4	B135	62	0	0	—
Engine 5	B135	61	0	0	—	

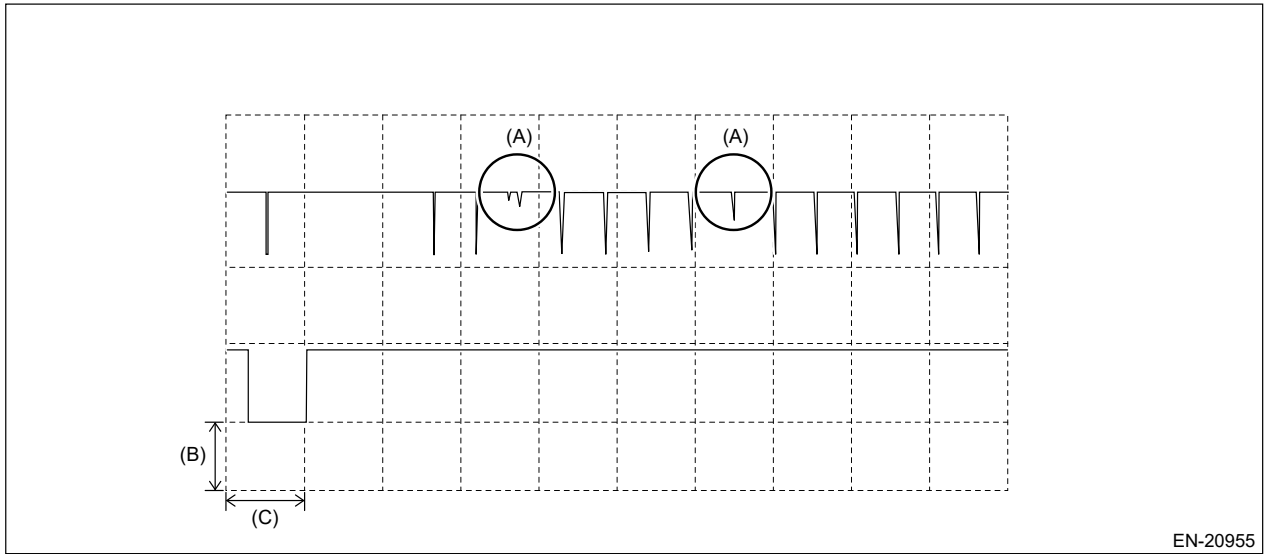
Note:

- After engine is warmed up, attach the check board for measurement.
- Set the select lever in "P" range or "N" range, or the shift lever in neutral.
- Turn the A/C to OFF.
- Turn all the accessory switches to OFF.
- Waveforms vary depending on a measurement environment and vehicle condition.

Note:

- For measurement of the waveform of the crankshaft position sensor, we recommend using the DST-i oscilloscope function or a general oscilloscope.
- The waveform of the crankshaft position sensor may be shown as in diagram (A) using the oscilloscope function of the Subaru Select Monitor.

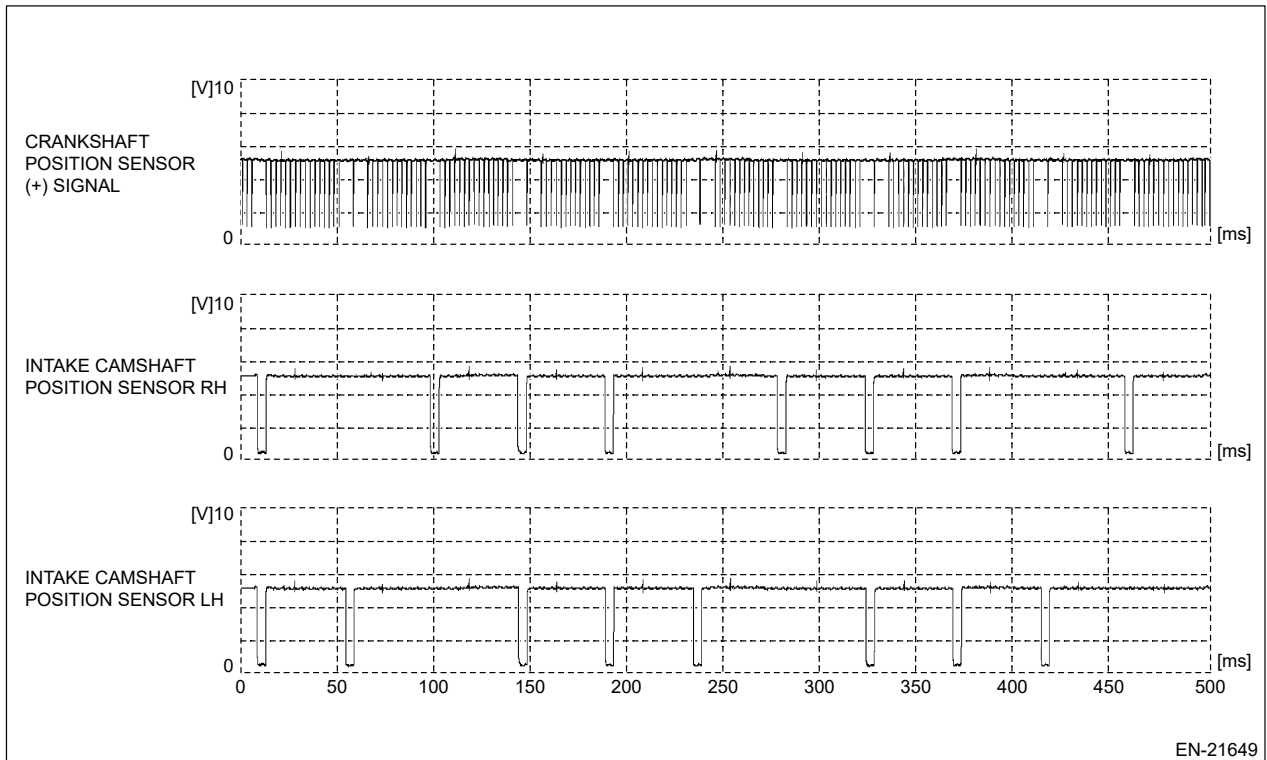
This is because the output unit of the crankshaft position sensor is smaller than the minimal measurement unit of the Subaru Select Monitor, and therefore this phenomenon is not a malfunction of either the Subaru Select monitor or the crankshaft position sensor.



(B) 5 V

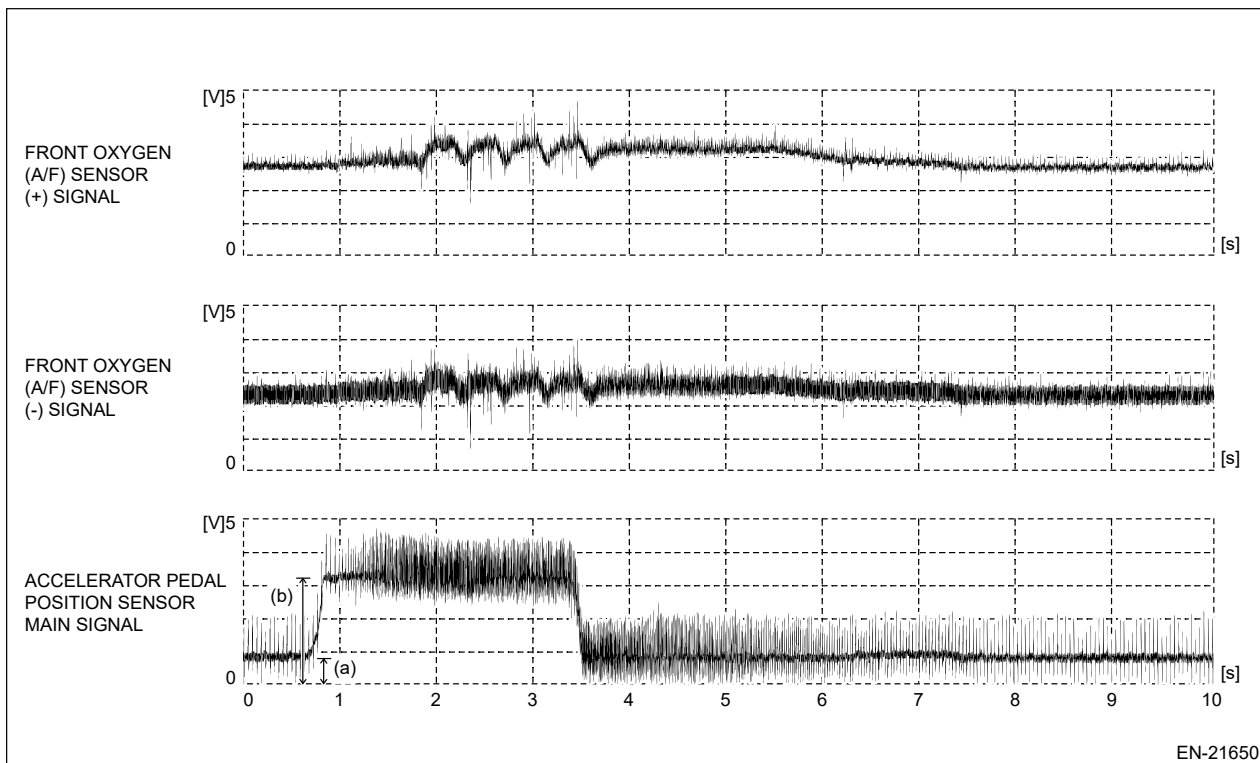
(C) 10 ms

1. Waveform 1



Measured terminal	Crankshaft position sensor (+) signal (B135) No. 40 (+) — Engine ground (B135) No. 63 (—):
	Intake camshaft position sensor RH (B135) No. 54 (+) — Engine ground (B135) No. 63 (—):
	Intake camshaft position sensor LH (B135) No. 41 (+) — Engine ground (B135) No. 63 (—):
Measuring condition	While engine idling

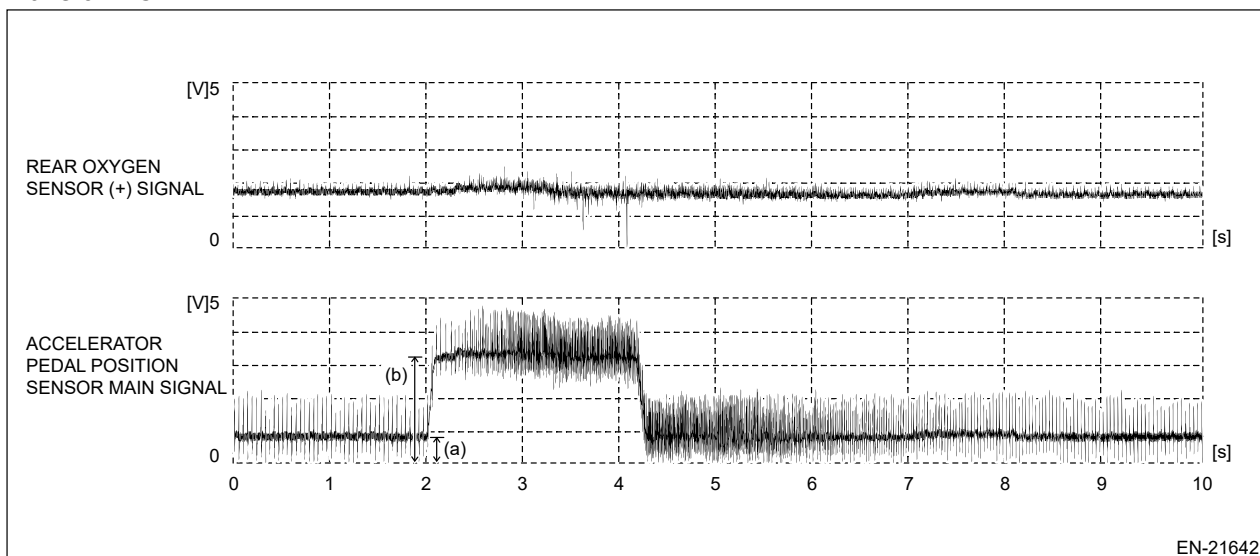
1. Waveform 2



EN-21650

Measured terminal	Front oxygen (A/F) sensor (+) signal (B135) No. 46 (+) — Engine ground (B135) No. 63 (-):
	Front oxygen (A/F) sensor (-) signal (B135) No. 33 (+) — Engine ground (B135) No. 63 (-):
	Accelerator pedal position sensor main signal (B134) No. 29 (+) — Engine ground (B135) No. 63 (-):
Measuring condition	(A) accelerator pedal fully Open (B) accelerator pedal fully closed

1. Waveform 3

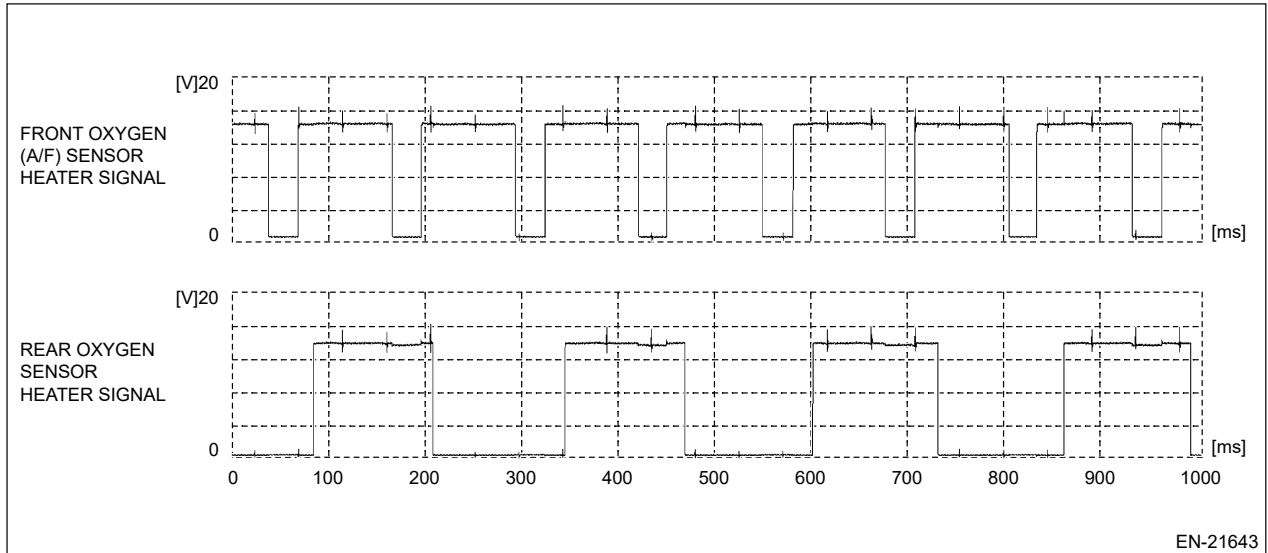


EN-21642

Measured terminal	Rear oxygen sensor (+) signal (B135) No. 57 (+) — Rear oxygen sensor (-) signal (B135) No. 56 (-):
	Accelerator pedal position sensor main signal (B134) No. 29 (+) — Engine

	ground (B135) No. 63 (-):
Measuring condition	(A) accelerator pedal fully Open (B) accelerator pedal fully closed

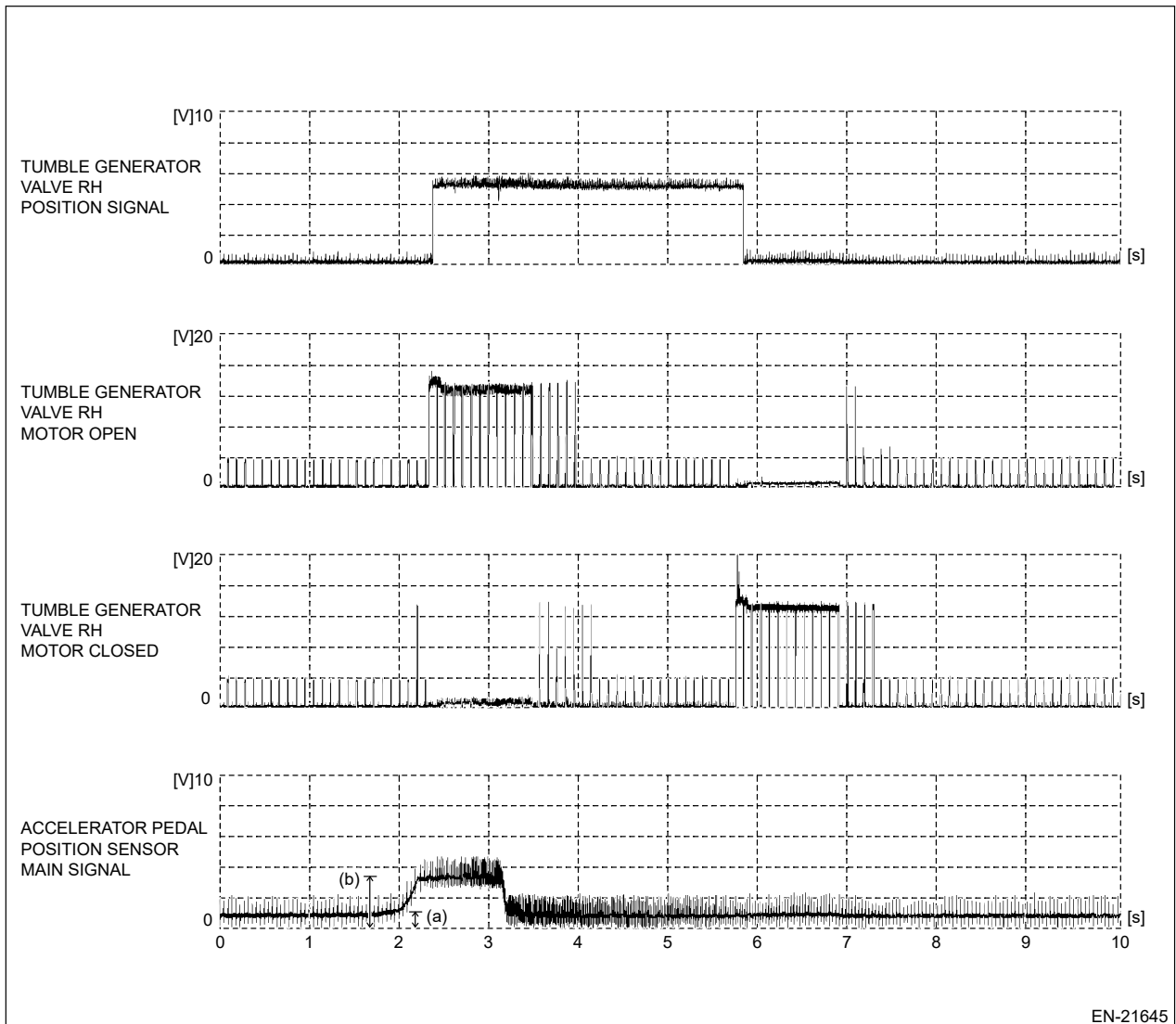
1. Waveform 4



EN-21643

Measured terminal	Front oxygen (A/F) sensor heater signal (B135) No. 5 (+) — Engine ground (B135) No. 63 (-):
	Rear oxygen sensor heater signal (B135) No. 10 (+) — Engine ground (B135) No. 63 (-):
Measuring condition	While engine idling

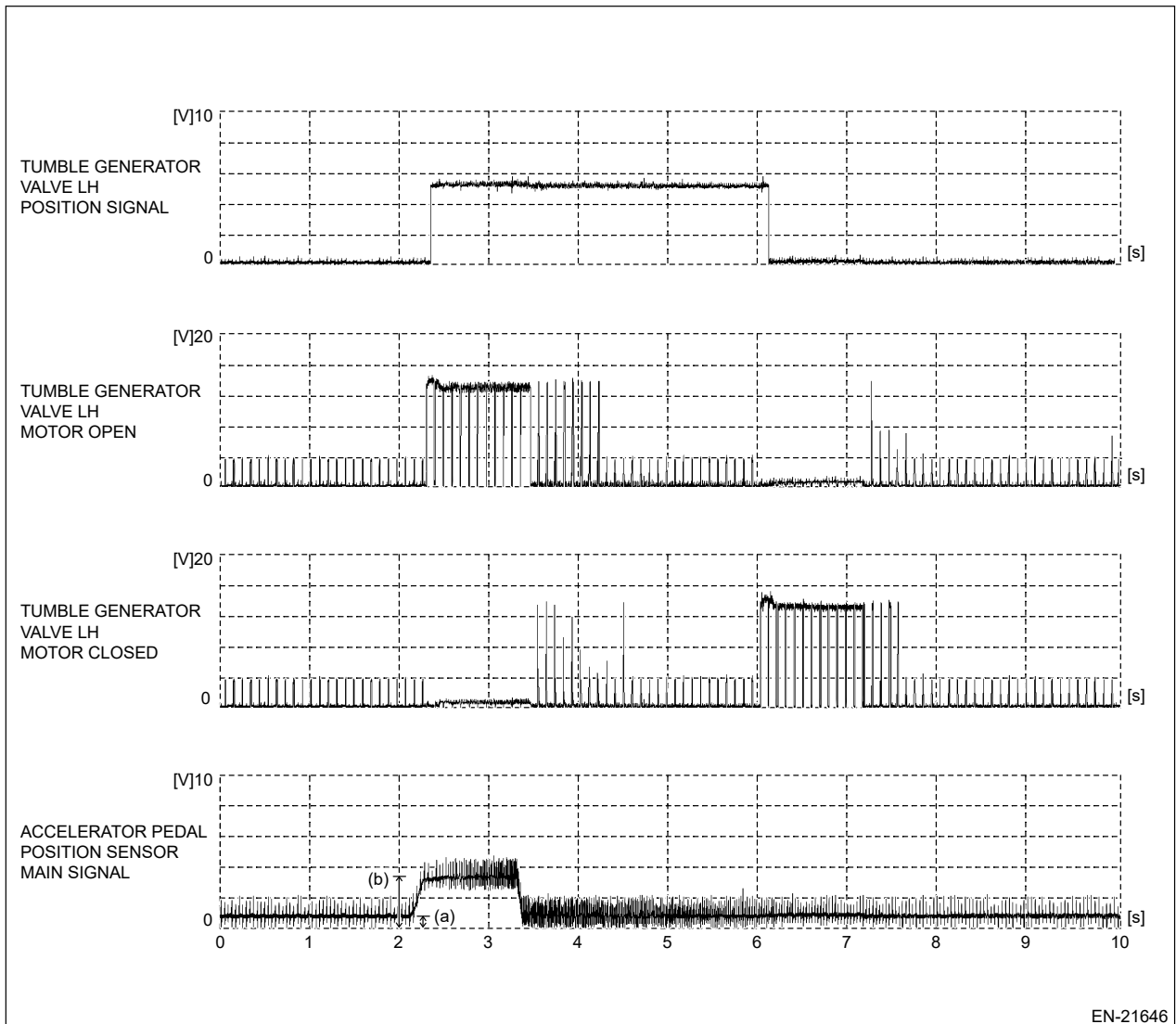
1. Waveform 5



EN-21645

Measured terminal	Tumble generator valve RH position signal (B135) No. 47 (+) – Engine ground (B135) No. 63 (-):
	Tumble generator valve RH motor open (B135) No. 52 (+) – Engine ground (B135) No. 63 (-):
	Tumble generator valve RH motor closed (B135) No. 13 (+) – Engine ground (B135) No. 63 (-):
Measuring condition	(A) accelerator pedal fully Open (B) accelerator pedal fully closed

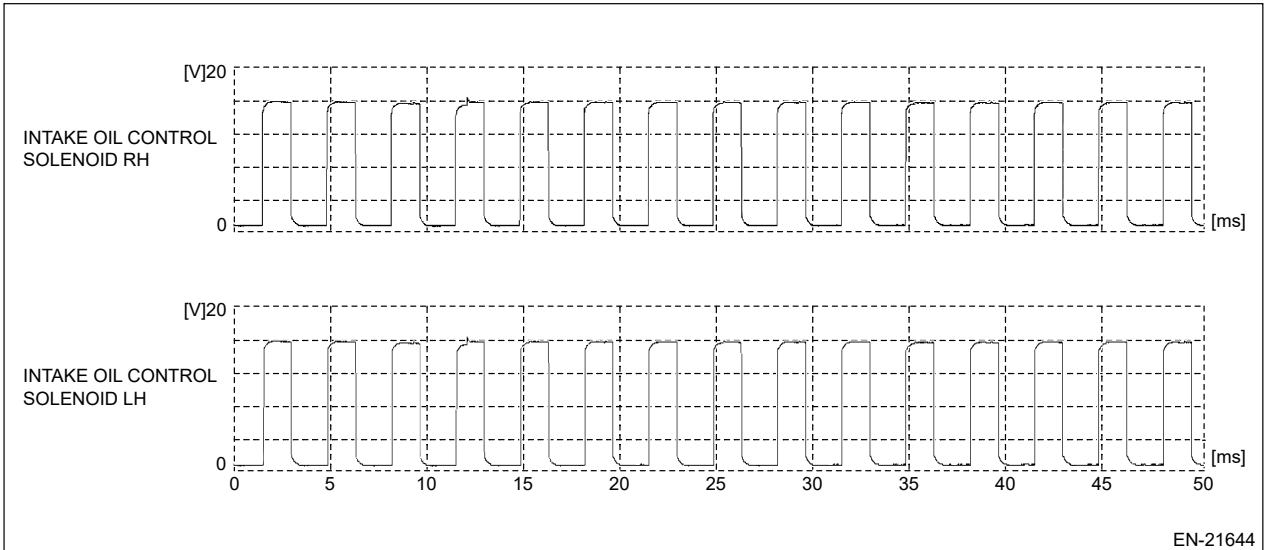
1. Waveform 6



EN-21646

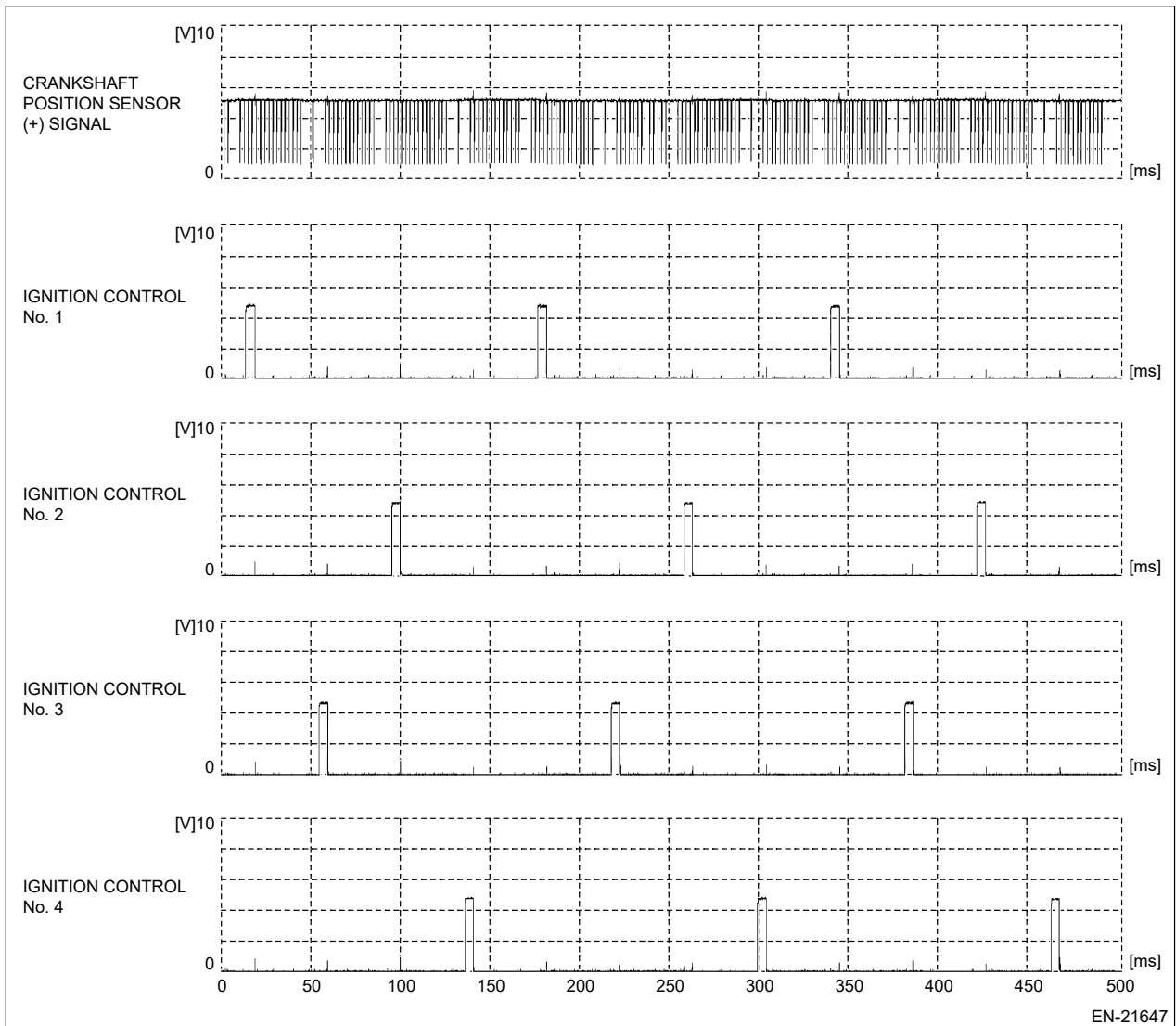
Measured terminal	Tumble generator valve LH position signal (B135) No. 40 (+) — Engine ground (B135) No. 63 (-):
	Tumble generator valve LH motor open (B135) No. 26 (+) — Engine ground (B135) No. 63 (-):
	Tumble generator valve LH motor closed (B135) No. 39 (+) — Engine ground (B135) No. 63 (-):
Measuring condition	(A) accelerator pedal fully Open (B) accelerator pedal fully closed

1. Waveform 7



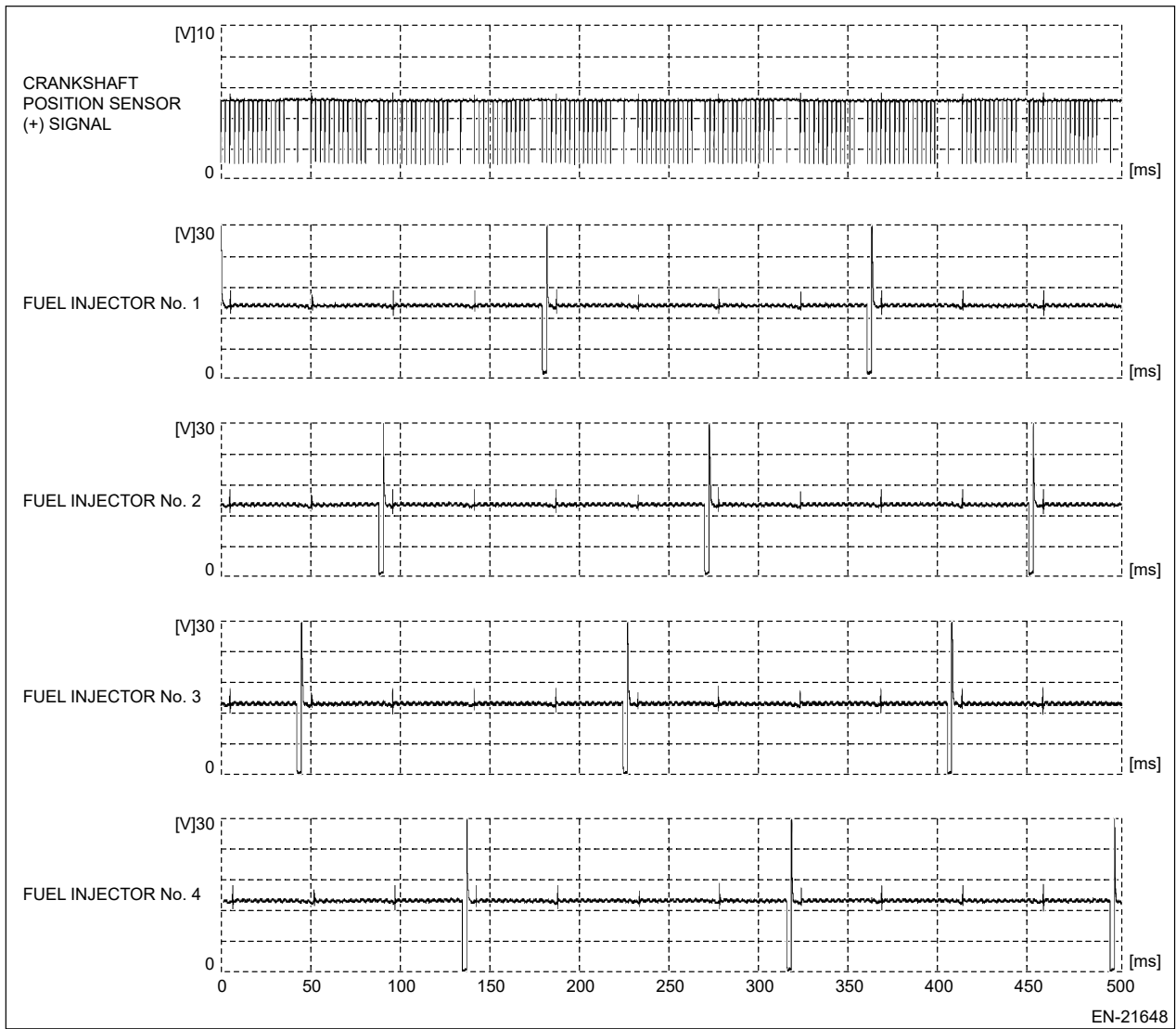
Measured terminal	Intake oil control solenoid RH (B135) No. 20 (+) — Engine ground (B135) No. 63 (-):
	Intake oil control solenoid LH (B135) No. 6 (+) — Engine ground (B135) No. 63 (-):
Measuring condition	While engine idling

1. Waveform 8



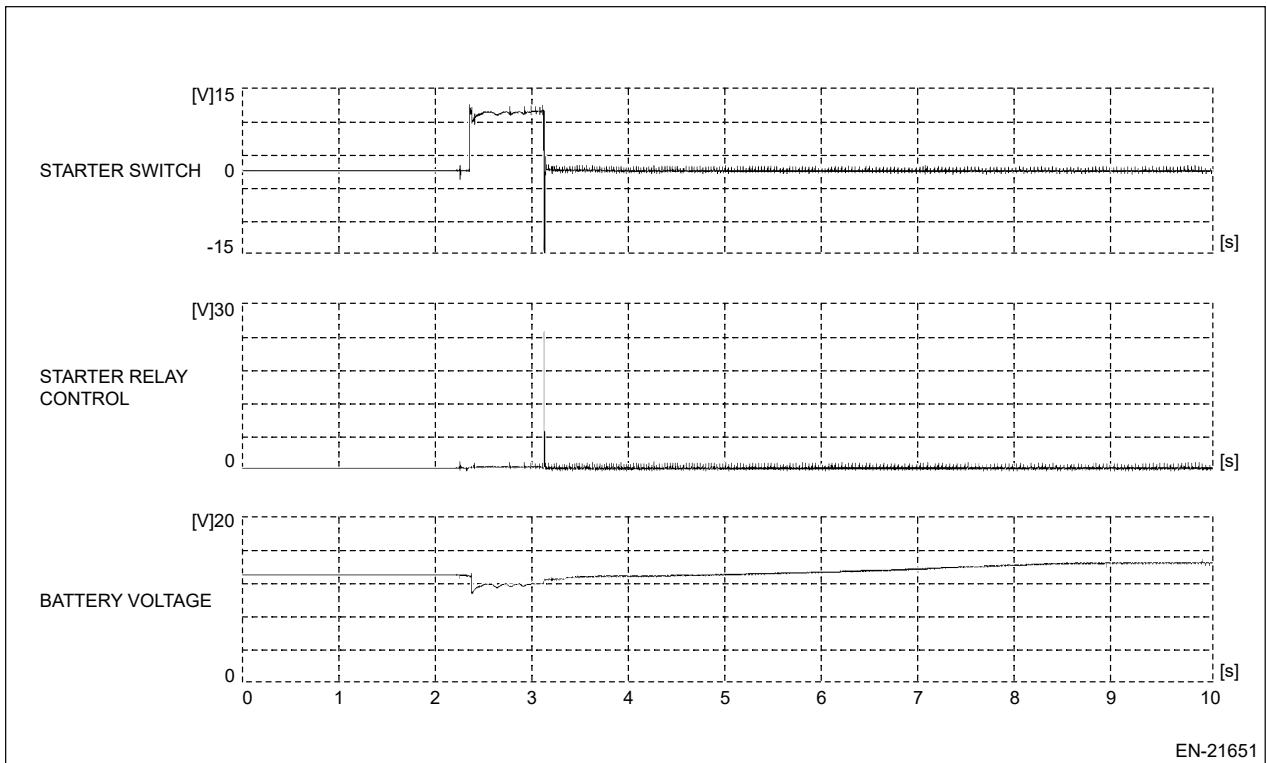
Measured terminal	Crankshaft position sensor (+) signal (B135) No. 40 (+) — Engine ground (B135) No. 63 (-):
	Ignition control #1 (B135) No. 37 (+) — Engine ground (B135) No. 63 (-):
	Ignition control #2 (B135) No. 35 (+) — Engine ground (B135) No. 63 (-):
	Ignition control #2 (B135) No. 38 (+) — Engine ground (B135) No. 63 (-):
	Ignition control #2 (B135) No. 36 (+) — Engine ground (B135) No. 63 (-):
Measuring condition	While engine idling

1. Waveform 9



Measured terminal	Crankshaft position sensor (+) signal (B135) No. 40 (+) — Engine ground (B135) No. 63 (-):
	Fuel injector #1 (B135) No. 23 (+) — Engine ground (B135) No. 63 (-):
	Fuel injector #2 (B135) No. 8 (+) — Engine ground (B135) No. 63 (-):
	Fuel injector #2 (B135) No. 9 (+) — Engine ground (B135) No. 63 (-):
	Fuel injector #2 (B135) No. 22 (+) — Engine ground (B135) No. 63 (-):
Measuring condition	While engine idling

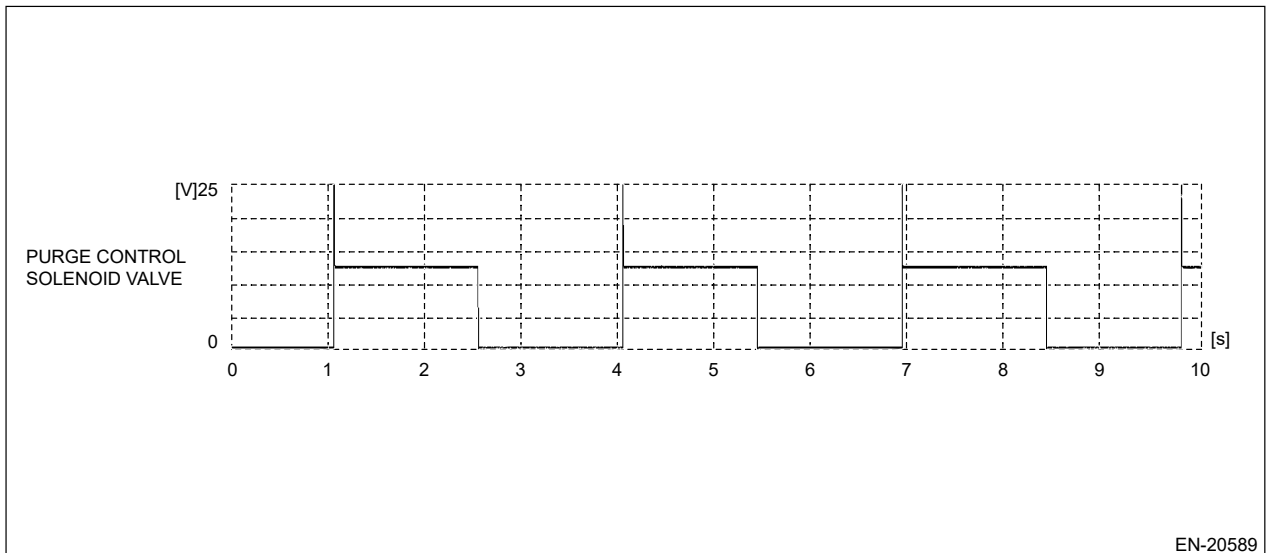
1. Waveform 10



EN-21651

Measured terminal	Starter relay control (B134) No. 62 (+) — Engine ground (B135) No. 63 (-):
	Starter switch (B134) No. 46 (+) — Engine ground (B135) No. 63 (-):
	Battery (+) — Battery (-):
Measuring condition	When engine is started

1. Waveform 11

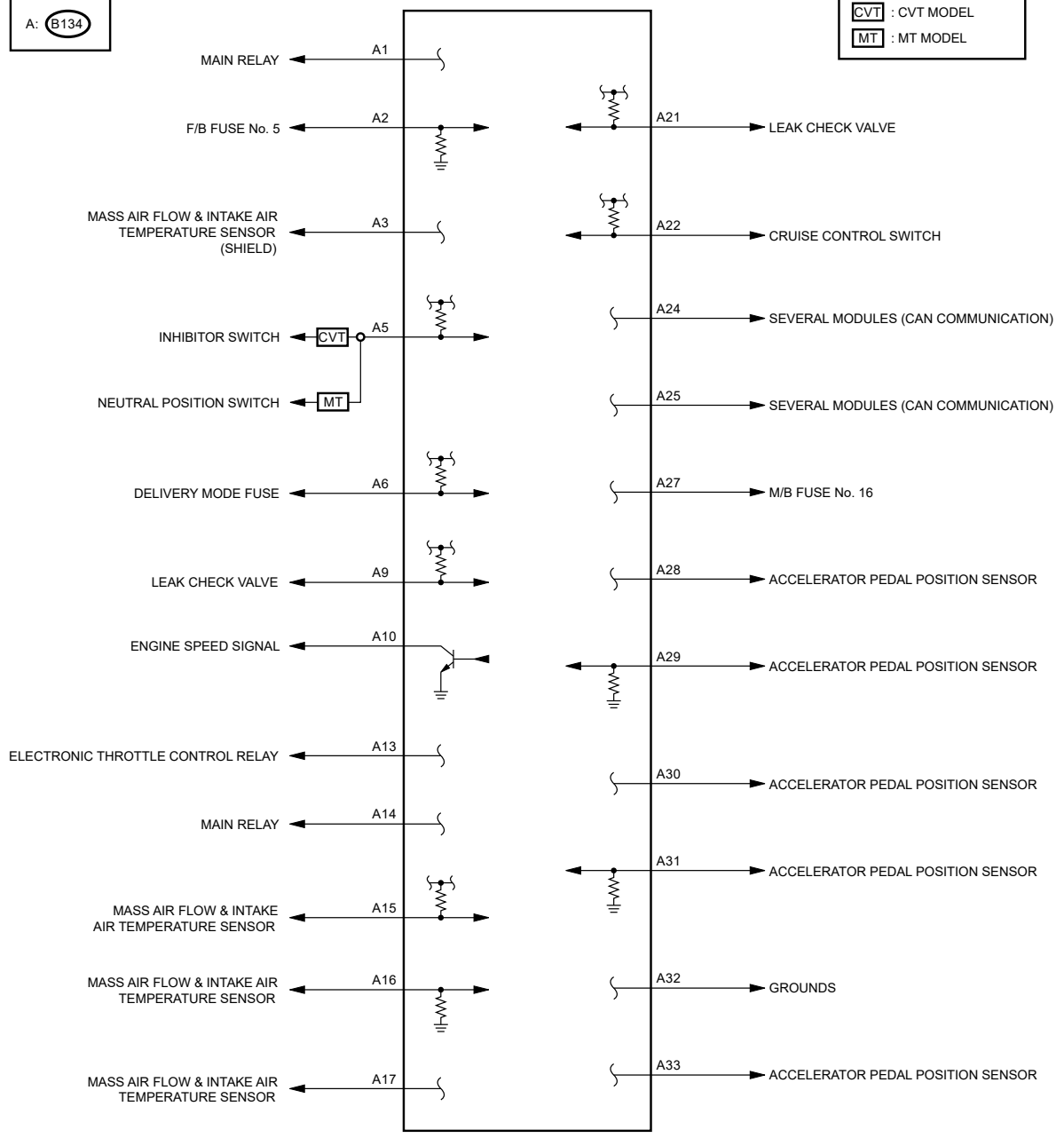


EN-20589

Measured terminal	Purge control solenoid valve (B135) No. 51 (+) — Engine ground (B135) No. 63 (-)
Measuring condition	During execution of active test using Subaru Select Monitor

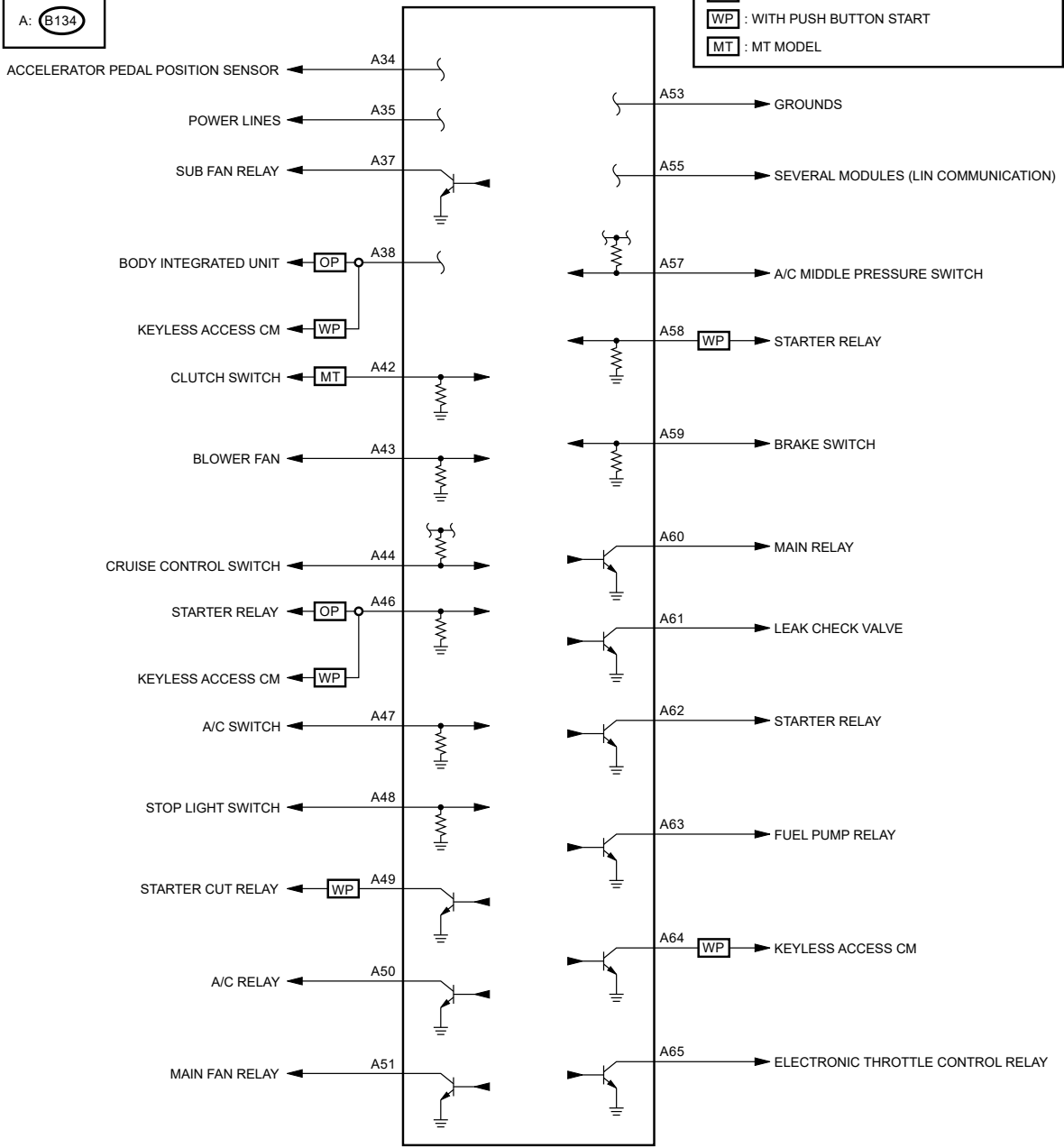
A: B134

CVT : CVT MODEL
 MT : MT MODEL

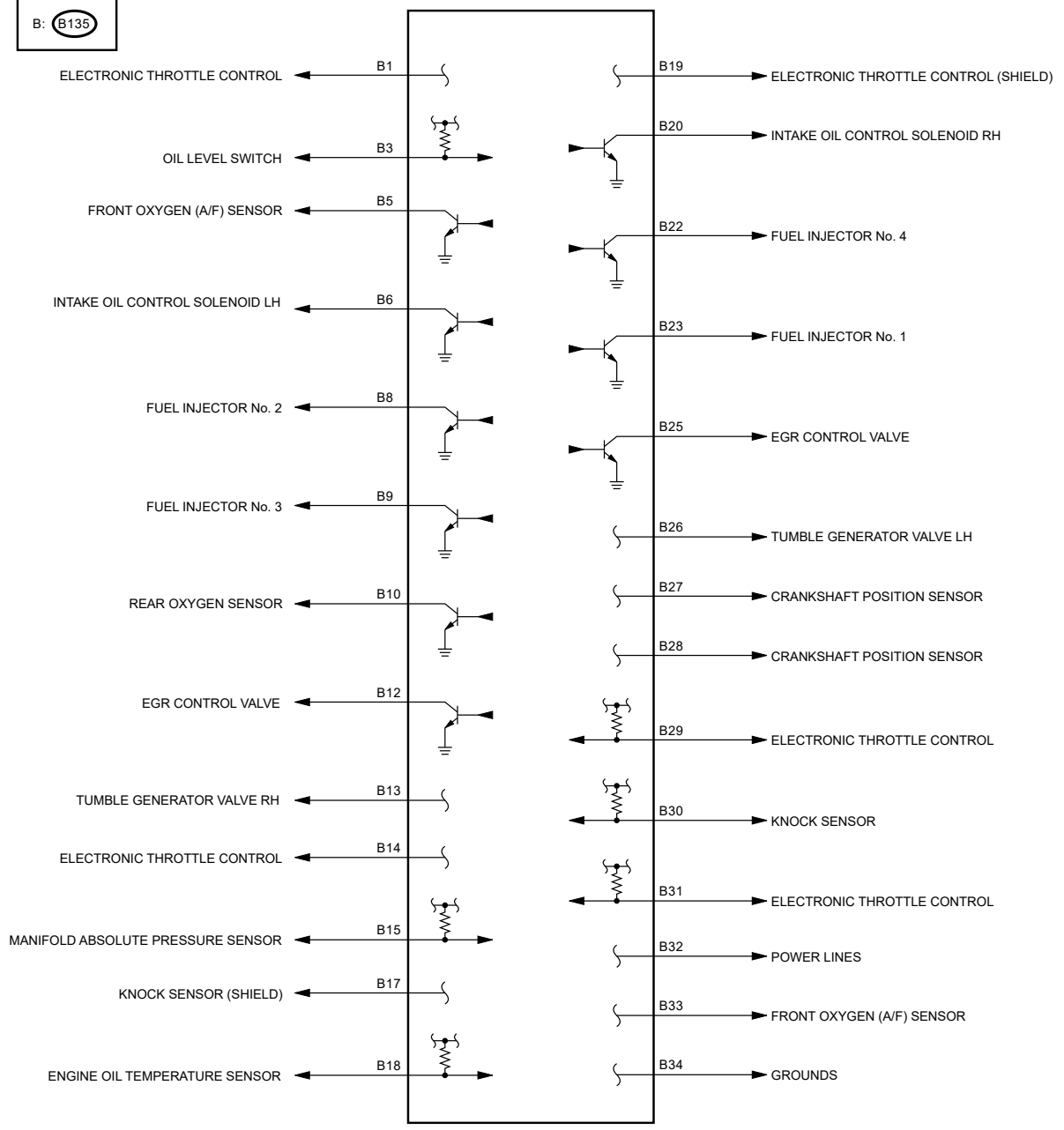


A: B134

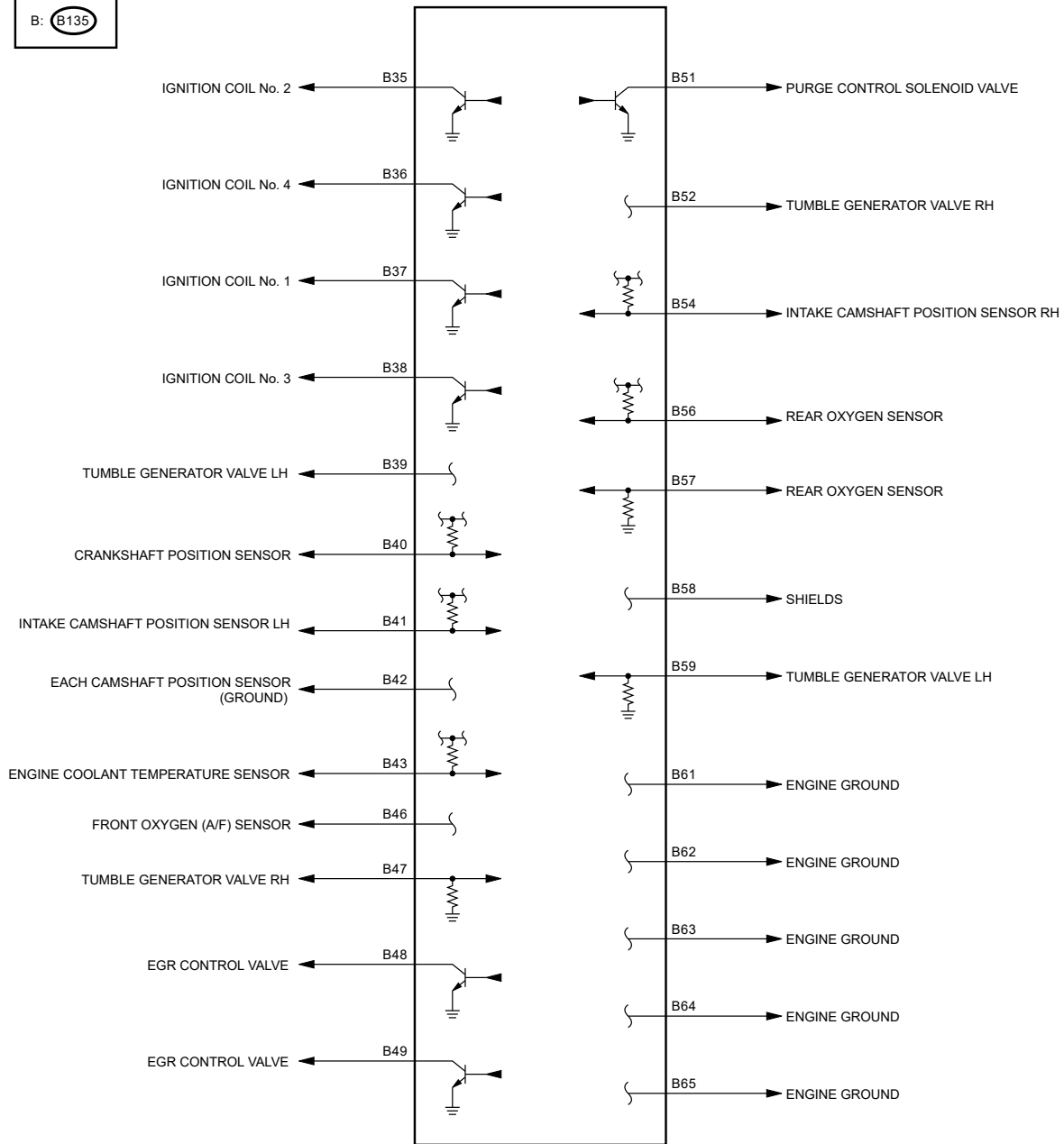
OP : WITHOUT PUSH BUTTON START
 WP : WITH PUSH BUTTON START
 MT : MT MODEL



B: B135



B: B135




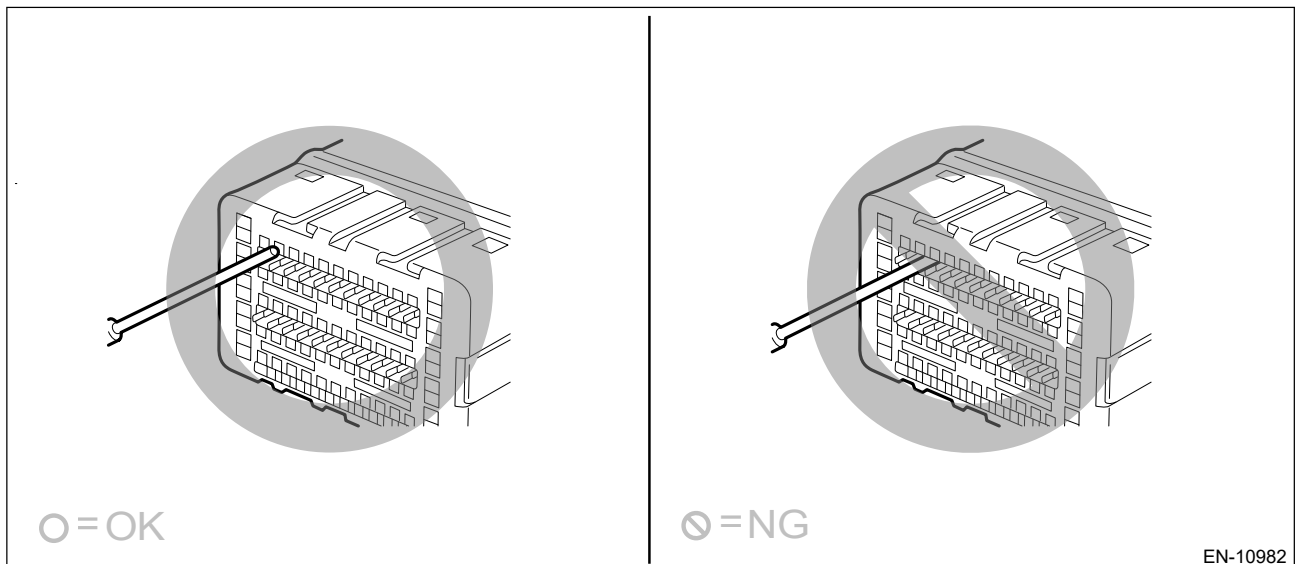
ENGINE (DIAGNOSTICS)(H4DO) > General Description

CAUTION

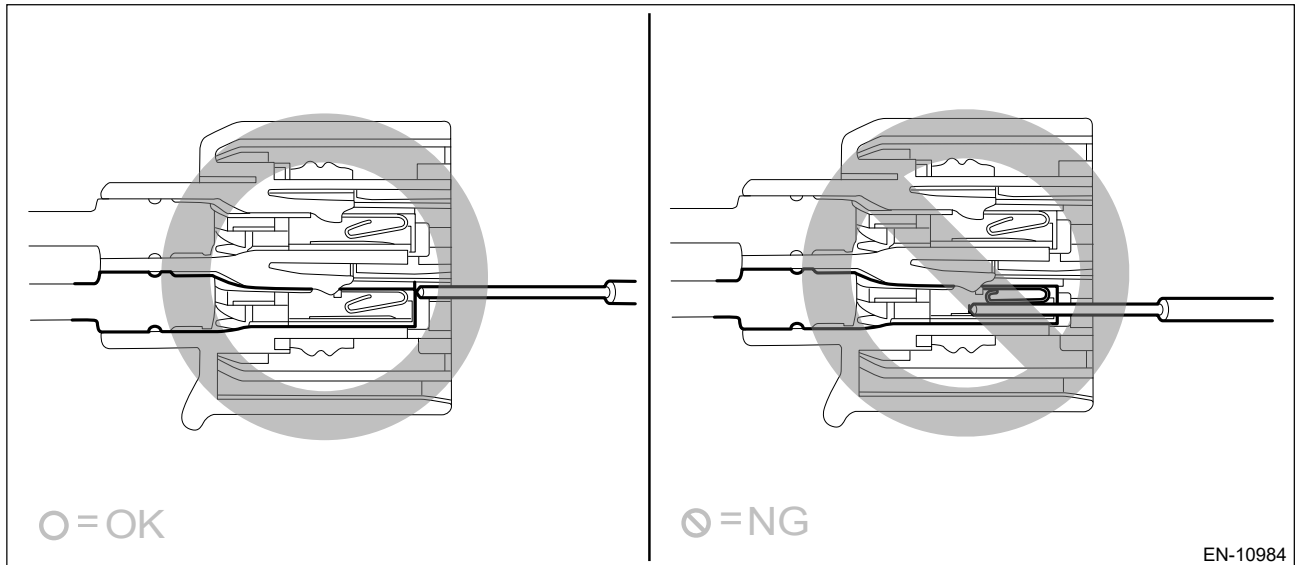
1. Airbag system wiring harness is routed near the ECM, main relay and fuel pump relay.

Caution:

- **Do not use electrical test equipment on the airbag system circuits.**
 - **Be careful not to damage the airbag system wiring harness when servicing the ECM, TCM, main relay and fuel pump relay.**
2. Never connect the battery in reverse polarity. Doing so will damage the ECM instantly, and other parts will also be damaged.
 3. Do not disconnect the battery cables while the engine is running. A large counter electromotive force will be generated in the generator, and this voltage may damage electronic parts such as ECM etc.
 4. When disconnecting the connectors of the electrical components, always be sure to turn the ignition switch to OFF. Perform the Clear Memory after connecting the connectors.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)
 5. When measuring the voltage or resistance of individual sensors or all electrical control modules, use a tapered pin with a diameter of 0.6 mm (0.024 in) or less and touch it to the tip of terminal.



Never insert the tapered pin into the terminal because it deforms inside which may lead to a malfunction.



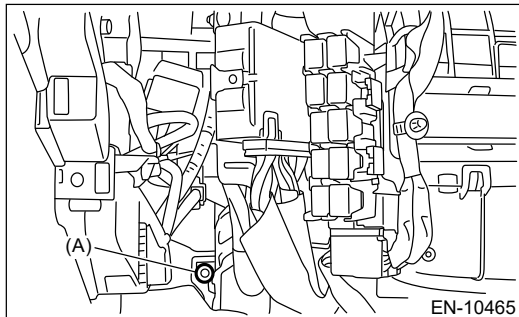
Caution:

When replacing the ECM, be careful not to use the ECM of wrong specification to avoid any damage on the fuel injection system.

Note:

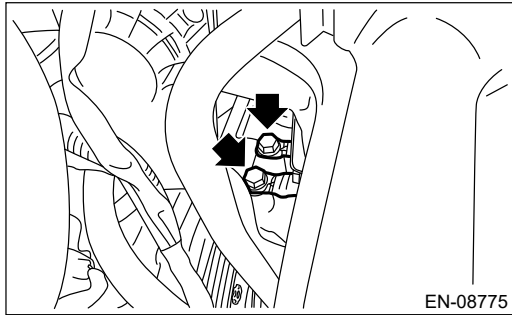
When replacing the ECM of the models with immobilizer, immobilizer system must be registered. For detailed procedures, refer to "REGISTRATION MANUAL FOR IMMOBILIZER".

6. Take care not to allow water to get into the connectors when servicing or washing the vehicle in rainy weather. Avoid exposure to water even if the connectors are waterproof.
7. Use ECM mounting stud bolts for the grounding point when measuring voltage and resistance inside the passenger compartment.



(A) Stud bolt


8. Use the engine ground terminal or engine assembly for the grounding point when measuring the voltage and resistance in engine compartment.





9. All parts related to the engine control system are precision parts. Do not drop or otherwise apply impact. Do not reuse the parts that are dropped accidentally.

10. Observe the following cautions when installing a radio in vehicle.

Caution:

- **The antenna must be kept as far apart as possible from the ECM.**  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Electrical Component Location>LOCATION > CONTROL MODULE.](#)
- **The antenna feeder must be placed as far apart as possible from the ECM and engine control system harness.**
- **Carefully adjust the antenna for correct matching.**
- **When mounting a large power type radio, pay special attention to the three items mentioned above.**
- **Incorrect installation of the radio may affect the operation of ECM.**

11. When disconnecting the fuel hose, release the fuel pressure.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel>PROCEDURE > RELEASING OF FUEL PRESSURE.](#)


12. Warning lights may illuminate when performing driving test with jacked-up or lifted-up condition, but this is not a system malfunction. The reason for this is the rotating speed difference between the front and rear wheels. When engine control system diagnosis is finished, perform the VDC memory clearance procedure of self-diagnosis function.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)

ENGINE (DIAGNOSTICS)(H4DO) > General Description

INSPECTION

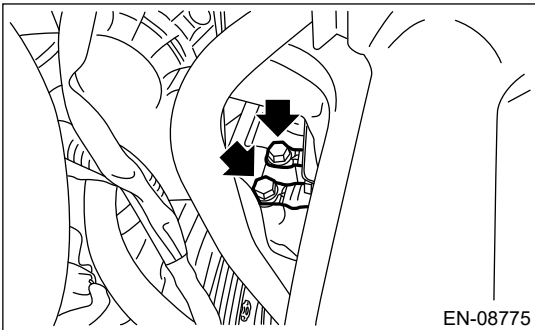
Before performing diagnostics, check the following item which might affect engine problems.

1. BATTERY

1. Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery>INSPECTION.](#)
2. Check the condition of the main and other fuses, and harnesses and connectors. Also check for proper grounding.

2. ENGINE GROUND

Make sure that the engine ground terminal has no contamination, corrosion or looseness and is properly connected to the engine.



ENGINE (DIAGNOSTICS)(H4DO) > General Description


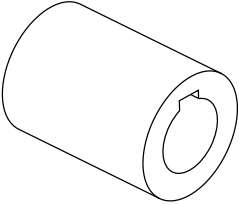
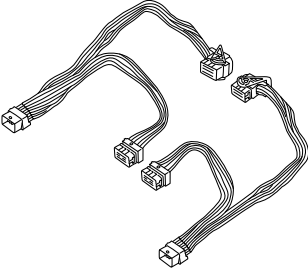
NOTE

- The on-board diagnostic (OBD) system detects and indicates a fault in various inputs and outputs of the complex electronic control. Malfunction indicator light in the combination meter indicates occurrence of a fault or trouble.
- Further, against such a failure of sensors as may disable the drive, the fail-safe function is provided to ensure the minimal drivability.
- The OBD system incorporated with the vehicles within this type of engine complies with OBD-II regulations. The OBD system monitors the components and the system malfunction listed in "Engine Section" which affects on emissions.
- When the system decides that a malfunction occurs, malfunction indicator light illuminates. At the same time of the malfunction indicator light illumination or blinking, a DTC and a freeze frame engine conditions are stored into on-board computer.
- The OBD system stores freeze frame engine condition data (engine load, engine coolant temperature, fuel trim, engine speed and vehicle speed, etc.) into on-board computer when it detects a malfunction.
- Freeze frame engine condition data are stored until the DTCs are cleared. However when such malfunctions as fuel trim fault and misfire are detected with the freeze frame engine condition data stored, they are rewritten into those related to the fuel trim fault and misfire.
- When the malfunction does not occur again for three consecutive driving cycles*, malfunction indicator light is turned off, but DTC remains at on-board computer.
*: One driving cycle means the period between the ignition switch ON and the ignition switch OFF after driving.
- When performing diagnosis, connect the Subaru Select Monitor or general scan tool to the vehicle.

ENGINE (DIAGNOSTICS)(H4DO) > General Description

PREPARATION TOOL

1. PREPARATION TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>STSSM4</p>	<p>— (Newly adopted tool)</p>	SUBARU SELECT MONITOR 4	<p>Used for setting of each function and troubleshooting for electrical system.</p> <p>Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".</p>
 <p>ST18252AA000</p>	18252AA000	CRANKSHAFT SOCKET	Used for rotating crankshaft.
 <p>ST18460AA050</p>	18460AA050	CHECK BOARD	Used for measuring voltage and resistance of ECM terminals.

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Oscilloscope	Used for measuring the sensor.
DST-i	Used together with Subaru Select Monitor 4.

ENGINE (DIAGNOSTICS)(H4DO) > General Diagnostic Table

INSPECTION

1. ENGINE

Note:

Malfunction of parts other than those listed is also possible.  [Ref. to MECHANICAL\(H4DO\)>Symptoms and causes.](#)

Symptoms	Faulty parts
1. Engine stalls during idling.	<ol style="list-style-type: none"> 1) Manifold absolute pressure sensor 2) Mass air flow and intake air temperature sensor 3) Ignition parts (*1) 4) Engine coolant temperature sensor (*2) 5) Crankshaft position sensor (*3) 6) Camshaft position sensor (*3) 7) Fuel injection parts (*4) 8) Electronic throttle control
2. Rough idling	<ol style="list-style-type: none"> 1) Manifold absolute pressure sensor 2) Mass air flow and intake air temperature sensor 3) Engine coolant temperature sensor (*2) 4) Ignition parts (*1) 5) Air intake system (*5) 6) Fuel injection parts (*4) 7) Electronic throttle control 8) Crankshaft position sensor (*3) 9) Camshaft position sensor (*3) 10) Oxygen sensor 11) Fuel pump and fuel pump relay 12) EGR control valve
3. Engine does not return to idle.	<ol style="list-style-type: none"> 1) Engine coolant temperature sensor 2) Electronic throttle control 3) Manifold absolute pressure sensor 4) Mass air flow and intake air temperature sensor 5) EGR control valve 6) Accelerator pedal position sensor 7) Engine oil temperature sensor
4. Poor acceleration	<ol style="list-style-type: none"> 1) Manifold absolute pressure sensor 2) Mass air flow and intake air temperature sensor 3) Electronic throttle control 4) Fuel injection parts (*4) 5) Fuel pump and fuel pump relay 6) Engine coolant temperature sensor (*2) 7) Crankshaft position sensor (*3) 8) Camshaft position sensor (*3) 9) Engine torque control signal circuit 10) Ignition parts (*1)

	<ul style="list-style-type: none"> 11) EGR control valve 12) Accelerator pedal position sensor 13) Engine oil temperature sensor
5. Engine stalls, hesitates, or sputters at acceleration.	<ul style="list-style-type: none"> 1) Manifold absolute pressure sensor 2) Mass air flow and intake air temperature sensor 3) Engine coolant temperature sensor (*2) 4) Crankshaft position sensor (*3) 5) Camshaft position sensor (*3) 6) Purge control solenoid valve 7) Fuel injection parts (*4) 8) Electronic throttle control 9) Fuel pump and fuel pump relay 10) EGR control valve
6. Surging	<ul style="list-style-type: none"> 1) Mass air flow and intake air temperature sensor 2) Manifold absolute pressure sensor 3) Engine coolant temperature sensor (*2) 4) Crankshaft position sensor (*3) 5) Camshaft position sensor (*3) 6) Fuel injection parts (*4) 7) Electronic throttle control 8) Fuel pump and fuel pump relay 9) EGR control valve
7. Spark knock	<ul style="list-style-type: none"> 1) Mass air flow and intake air temperature sensor 2) Manifold absolute pressure sensor 3) Engine coolant temperature sensor 4) Knock sensor 5) Fuel injection parts (*4) 6) Fuel pump and fuel pump relay 7) EGR control valve
8. After burning in exhaust system	<ul style="list-style-type: none"> 1) Mass air flow and intake air temperature sensor 2) Manifold absolute pressure sensor 3) Engine coolant temperature sensor (*2) 4) Fuel injection parts (*4) 5) Fuel pump and fuel pump relay

*1: Check ignition coil and spark plug.

*2: Indicate the symptom occurring only in cold temperatures.

*3: Ensure the secure installation.

*4: Check fuel injector and fuel filter.

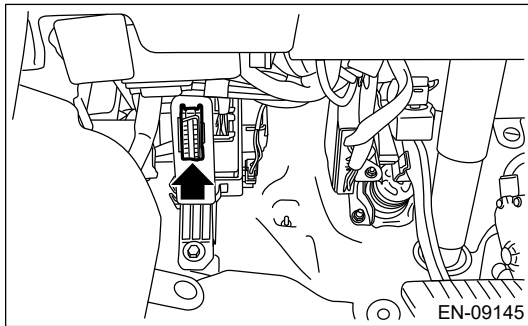
*5: Inspect air leak in air intake system.

ENGINE (DIAGNOSTICS)(H4DO) > General Scan Tool

OPERATION

1. HOW TO USE GENERAL SCAN TOOL

1. Prepare a scan tool (general scan tool) required by SAE J1978.
2. Connect the general scan tool to data link connector located in the lower portion of the instrument panel (on the driver's side).



3. Using the general scan tool, call up each data. General scan tool functions consist of:
 - (1) MODE \$01: Current powertrain diagnostic data
 - (2) MODE \$02: Powertrain freeze frame data
 - (3) MODE \$03: Emission-related powertrain DTC
 - (4) MODE \$04: Clear/Reset emission-related diagnostic information
 - (5) MODE \$06: Request on-board monitoring test results for intermittently monitored systems
 - (6) MODE \$07: Initial emission-related powertrain DTC
 - (7) MODE \$08: Request control for on-board system, test, and component
 - (8) MODE \$09: Request vehicle information
4. Read out the data according to repair procedures. (For detailed operation procedure, refer to the general scan tool operation manual.)

Note:

For details concerning DTC, refer to "List of Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

2. MODE \$01 (CURRENT POWERTRAIN DIAGNOSTIC DATA)

Refer to data denoting the current operating condition of analog input/output, digital input/output or the powertrain system.

A list of the support data and PID (Parameter Identification) codes are shown in the following table.

PID	Data	Unit of measure
\$01	Number of emission-related powertrain DTC, and malfunction indicator light status and diagnosis support information	—
\$03	Fuel system control status	—
\$04	Calculated engine load value	%
\$05	Engine coolant temperature	Celsius
\$06	Short term fuel trim	%
\$07	Long term fuel trim	%

\$0B	Intake manifold absolute pressure	kPa
\$0C	Engine speed	rpm
\$0D	Vehicle speed	MPH
\$0E	Ignition timing advance	°
\$0F	Intake air temperature	Celsius
\$10	Intake air amount	g/s
\$11	Throttle valve opening angle	%
\$13	Air fuel ratio sensor	—
\$15	Oxygen sensor output voltage and short term fuel trim associated with oxygen sensor (bank 1 sensor 2)	V and %
\$1C	Supporting OBD system	—
\$1F	Elapsed time after starting the engine	sec
\$21	Travel distance after the malfunction indicator light illuminates	miles
\$24	A/F value and A/F sensor output voltage (bank 1 sensor 1)	— and V
\$2C	Target EGR	%
\$2D	EGR deviation	%
\$2E	Evaporative purge	%
\$2F	Fuel level	%
\$30	Number of warm ups after DTC clear	Time
\$31	Travel distance after DTC clear	miles
\$33	Barometric pressure	kPa
\$34	A/F value and A/F sensor current (bank 1 sensor 1)	— and mA
\$3C	Catalyst temperature #1	Celsius
\$41	Diagnostic monitor of each drive cycle	—
\$42	ECM power voltage	V
\$43	Absolute load	%
\$44	A/F target lambda	—
\$45	Relative throttle opening angle	%
\$46	Ambient temperature	Celsius
\$47	Absolute throttle opening angle 2	%
\$49	Absolute accelerator opening angle 1	%
\$4A	Absolute accelerator opening angle 2	%
\$4C	Target throttle opening angle	%
\$4D	Engine operating time while malfunction indicator lit	min
\$4E	Elapsed time after DTC clear	min
\$51	Fuel used	—
\$53	ELCM pressure	kPa
\$5A	Relative accelerator opening angle	%
\$5C	Engine oil temperature	Celsius
\$56	Learning value of sub feedback compensation level	—
\$65	Neutral status	—

Note:

Refer to general scan tool manufacturer's operation manual to access current powertrain diagnostic data (MODE \$01).

3. MODE \$02 (POWERTRAIN FREEZE FRAME DATA)

Refer to data denoting the operating condition when trouble is detected by on-board diagnosis system.

A list of the support data and PID (Parameter Identification) codes are shown in the following table.


PID	Data	Unit of measure
\$02	DTC that caused freeze frame data to be stored	—
\$03	Fuel system control status	—
\$04	Calculated engine load value	%
\$05	Engine coolant temperature	Celsius
\$06	Short term fuel trim (bank 1 sensor 1)	%
\$07	Long term fuel trim (bank 1 sensor 1)	%
\$0B	Intake manifold absolute pressure	kPa
\$0C	Engine speed	rpm
\$0D	Vehicle speed	MPH
\$0E	Ignition timing advance	°
\$0F	Intake air temperature	Celsius
\$10	Intake air amount	g/s
\$11	Throttle valve opening angle	%
\$13	Air fuel ratio sensor	—
\$15	Oxygen sensor output voltage and short term fuel trim associated with oxygen sensor (bank 1 sensor 2)	V and %
\$1C	Supporting OBD system	—
\$1F	Elapsed time after starting the engine	sec
\$2C	Target EGR	%
\$2D	EGR deviation	%
\$2E	Evaporative purge	%
\$2F	Fuel level	%
\$33	Barometric pressure	kPa
\$42	ECM power voltage	V
\$43	Absolute load	%
\$44	A/F target lambda	—
\$45	Relative throttle opening angle	%
\$46	Ambient temperature	Celsius
\$47	Absolute throttle opening angle 2	%
\$49	Absolute accelerator opening angle 1	%
\$4A	Absolute accelerator opening angle 2	%
\$4C	Target throttle opening angle	%

\$51	Applicable fuel	—
\$65	Neutral status	—

Note:

Refer to general scan tool manufacturer’s operation manual to access freeze frame data (MODE \$02).

4. MODE \$03 (EMISSION-RELATED POWERTRAIN DTC)

Refer to “List of Diagnostic Trouble Code (DTC)” for information about data denoting emission-related powertrain DTC.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DQ\)>List of Diagnostic Trouble Code \(DTC\).](#)

5. MODE \$04 (CLEAR/RESET EMISSION-RELATED DIAGNOSTIC INFORMATION)

Refer to the mode used to clear or reset emission-related diagnostic information.

Note:

- Refer to the manufacturer’s operation manual for the general scan tool to clear the emission-related diagnostic information (MODE \$04).
- Initial diagnosis of electronic throttle control is performed after memory clearance. Wait for 10 seconds or more after turning the ignition switch to ON, and then start the engine.

6. MODE \$06 (REQUEST ON-BOARD MONITORING TEST RESULTS FOR INTERMITTENTLY MONITORED SYSTEMS)

Refer to diagnostic value of troubleshooting and data of test limit indicated on the support data bit sequence table. A list of the support data is shown in the table 1.

Note:

- **Subaru Select Monitor**
For detailed operation procedures, refer to “Application help”.
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.
- **Some items are not displayed according to the specifications.**
- **List of measurement items for each DTC of “VVT monitor bank 1” and “VVT monitor bank 2”**
A list of the measurement items is shown in the table 2. (This is used for a check of on-board monitor test result of DTC P000A, P000C, P0011, P0016, P0018, and P0021.)

Table 1

OBDMI D	TID	SID	Diagnostic item
\$01	\$84	\$1E	A/F sensor range failure (Bank 1 Sensor 1)
	\$85	\$1E	
	\$86	\$20	A/F sensor response failure (Bank 1 Sensor 1)
	\$91	\$20	
	\$92	\$10	
	\$A3	\$20	

	\$A4	\$10	
	\$AC	\$10	
	\$AD	\$10	
	\$AE	\$10	
	\$AF	\$10	
	\$CD	\$20	
	\$CF	\$20	
	\$DF	\$10	
\$02	\$07	\$0B	Oxygen sensor drop failure (Bank 1 Sensor 2)
	\$08	\$0B	
	\$A5	\$0B	
	\$05	\$10	Oxygen sensor response failure (Bank 1 Sensor 2)
	\$06	\$10	
	\$BD	\$10	
	\$02	\$D1	\$10
\$D2		\$01	
\$21	\$89	\$20	Catalyst deterioration diagnosis (Bank 1)
\$31	\$8A	\$FD	EGR system diagnosis
\$35	\$8B	\$9D	VVT monitor bank 1
	\$8C	\$9D	
	\$8D	\$9D	
	\$8E	\$9D	
	\$D3	\$9D	
	\$D5	\$9D	
	\$D6	\$9D	
\$36	\$8B	\$9D	VVT monitor bank 2
	\$8C	\$9D	
	\$8D	\$9D	
	\$8E	\$9D	
	\$D3	\$9D	
	\$D5	\$9D	
	\$D6	\$9D	
\$3C	\$C1	\$FE	Evaporative emission control system (0.02 inch leak)
	\$C2	\$FE	
	\$C3	\$FE	
	\$C4	\$FE	
	\$C5	\$FE	
	\$C6	\$35	
	\$C7	\$FE	
	\$C8	\$FE	
	\$C9	\$FE	

	\$CA	\$FE	
\$3D	\$E2	\$FE	Purge flow
\$41	\$9B	\$14	A/F sensor heater characteristics failure (Bank 1 Sensor 1)
\$42	\$A2	\$24	Oxygen sensor heater characteristics failure (Bank 1 Sensor 2)
\$A1	\$0B	\$24	Misfire monitoring (all cylinders)
	\$0C	\$24	
\$A2	\$0B	\$24	Misfire monitoring (#1 cylinder)
	\$0C	\$24	
\$A3	\$0B	\$24	Misfire monitoring (#2 cylinder)
	\$0C	\$24	
\$A4	\$0B	\$24	Misfire monitoring (#3 cylinder)
	\$0C	\$24	
\$A5	\$0B	\$24	Misfire monitoring (#4 cylinder)
	\$0C	\$24	

Table 2

OBDMID	TID	SID	Diagnostic item		
\$35	\$8B	\$9D	+	Intake	VVT monitor bank 1 (RH)
	\$8C	\$9D	-		
\$36	\$8B	\$9D	+	Intake	VVT monitor bank 2 (LH)
	\$8C	\$9D	-		

7. MODE \$07 (INITIAL EMISSION-RELATED POWERTRAIN DTC)

Refer to the data of DTC (pending code) for troubleshooting result about emission in the first time.

8. MODE \$08 (REQUEST CONTROL FOR ON-BOARD SYSTEM, TEST, AND COMPONENT)

Perform "Active Test" of the on-board system.


9. MODE \$09 (REQUEST VEHICLE INFORMATION)

Refer to the data of the vehicle specification.

ENGINE (DIAGNOSTICS)(H4DO) > Inspection Mode

PROCEDURE

Perform the diagnosis shown in the following DTC table.



When performing the diagnosis not listed in "List of Diagnostic Trouble Code (DTC)", refer to the item on the drive cycle.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Drive Cycle.](#)

DTC	Item	Condition
B1570	ANTENNA	—
B1571	REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM)	—
B1572	IMM CIRCUIT EXCEPT ANTENNA CIRCUIT	—
B1574	KEY COMMUNICATION FAILURE	—
B1575	INCORRECT IMMOBILIZER KEY	—
B1576	EGI CONTROL MODULE EEPROM	—
B1577	IMM CONTROL MODULE EEPROM	—
B1578	METER	—
P0010	"A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1	—
P0020	"A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2	—
P0031	A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 1	—
P0032	A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 1	—
P0037	A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 2	—
P0038	A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 2	—
P0072	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" LOW	—
P0073	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" HIGH	—
P0102	MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT LOW	—
P0103	MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT HIGH	—
P0107	MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT LOW	—
P0108	MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT HIGH	—
P0112	INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW BANK 1	—
P0113	INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH BANK 1	—
P0117	ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT LOW	—


P0118	ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT HIGH	—
P0122	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW	—
P0123	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH	—
P0131	A/F / O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 1	—
P0132	A/F / O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 1	—
P0197	ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT LOW	—
P0198	ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT HIGH	—
P0201	CYLINDER 1 INJECTOR "A" CIRCUIT	—
P0202	CYLINDER 2 INJECTOR "A" CIRCUIT	—
P0203	CYLINDER 3 INJECTOR "A" CIRCUIT	—
P0204	CYLINDER 4 INJECTOR "A" CIRCUIT	—
P0222	THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW	—
P0223	THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT HIGH	—
P0327	KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT LOW BANK 1 OR SINGLE SENSOR	—
P0328	KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT HIGH BANK 1 OR SINGLE SENSOR	—
P0335	CRANKSHAFT POSITION SENSOR "A" CIRCUIT	—
P0336	CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE	—
P0340	CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 1 OR SINGLE SENSOR	—
P0341	CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 1 OR SINGLE SENSOR	—
P0345	CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 2	—
P0346	CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 2	—
P0351	IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN	—
P0352	IGNITION COIL "B" PRIMARY CONTROL CIRCUIT/OPEN	—
P0353	IGNITION COIL "C" PRIMARY CONTROL CIRCUIT/OPEN	—
P0354	IGNITION COIL "D" PRIMARY CONTROL CIRCUIT/OPEN	—
P0452	EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT LOW	—
P0453	EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT HIGH	—

P0458	EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT LOW	—
P0512	STARTER (SWITCH) REQUEST CIRCUIT	—
P0560	SYSTEM VOLTAGE	—
P0604	INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR	—
P0605	INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR	—
P0606	CONTROL MODULE PROCESSOR	—
P060A	INTERNAL CONTROL MODULE MONITORING PROCESSOR PERFORMANCE	—
P060B	INTERNAL CONTROL MODULE A/D PROCESSING PERFORMANCE	—
P0616	STARTER RELAY "A" CIRCUIT LOW	—
P0617	STARTER RELAY "A" CIRCUIT HIGH	—
P062F	INTERNAL CONTROL MODULE EEPROM ERROR	—
P0685	ECM/PCM POWER RELAY CONTROL CIRCUIT/OPEN	—
P081A	STARTER DISABLE CIRCUIT LOW	—
P1160	THROTTLE RETURN SPRING	—
P1C00	BATTERY MONITOR MODULE "A" PERFORMANCE	—
P2008	TGV CONTROL CIRCUIT/OPEN BANK 1	—
P2009	TGV CONTROL CIRCUIT LOW BANK 1	—
P2011	TGV CONTROL CIRCUIT/OPEN BANK 2	—
P2012	TGV CONTROL CIRCUIT LOW BANK 2	—
P2016	TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 1	—
P2017	TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 1	—
P2021	TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 2	—
P2022	TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 2	—
P2101	THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE	—
P2102	THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT LOW	—
P2103	THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT HIGH	—
P2109	THROTTLE/PEDAL POSITION SENSOR "A" MINIMUM STOP PERFORMANCE	—
P2119	THROTTLE ACTUATOR "A" CONTROL THROTTLE BODY RANGE/PERFORMANCE	—
P2122	THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT LOW	—
P2123	THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH	—

P2127	THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW	—
P2128	THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH	—
P2135	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE CORRELATION	—
P2138	THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE CORRELATION	—
P2401	EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT LOW	Engine coolant temperature: 5 — 45°C (41 — 113°F) Intake air temperature: 5 — 50°C (41 — 122°F)
P2419	EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT LOW	—
P2530	IGNITION SWITCH RUN POSITION CIRCUIT	—
U0073	CONTROL MODULE COMMUNICATION BUS "A" OFF	—
U0077	LIN COMMUNICATION BUS "ECM/PCM" OFF	—
U0101	LOST COMMUNICATION WITH TCM	—
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	—
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	—
U0402	INVALID DATA RECEIVED FROM TCM	—
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	—
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	—
U1712	LOST LIN COMMUNICATION WITH BATTERY "1" MONITOR MODULE	—

1. Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 L (5.3 — 10.6 US gal, 4.4 — 8.8 Imp gal)].
2. Clear the memory.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)
3. Read the diagnostic trouble code (DTC) and check that no DTC is displayed.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)


Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis using "Diagnostic Procedure with Diagnostic Trouble Code (DTC)".  **[Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\).](#) After solving the DTC, repeat from step 2).**


4. Start the engine, and run the engine at idle for 10 seconds or more.
5. Read the readiness code using Subaru Select Monitor and check that the concerned DTC is not displayed. For detailed operation procedures, refer to "PC application help for Subaru Select Monitor".

Note:

- The readiness code shows self-diagnosis status of each DTC. If any DTC is displayed when you select the readiness code, the self-diagnosis of the DTC is not executed or completed. After the self-diagnosis is complete, DTC will no longer be displayed regardless of the diagnostic result.
- Self-diagnosis is executed every time when the ignition switch is turned to ON. Therefore, even after the self-diagnosis is complete and nothing is displayed on the readiness code display, if you turn the ignition switch to ON again after turning it OFF, some DTCs may be displayed on the readiness code display.
- After you repair a DTC and perform the Inspection Mode or the drive cycle, use the readiness code to check if the self-diagnosis of the DTC is completed. If the concerned DTC is displayed, the self-diagnosis of the DTC is not complete. Repeat from step 4).













6. Read the diagnostic trouble code (DTC) and check the DTC.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)





Note:










If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis using "Diagnostic Procedure with Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\).](#) After solving the DTC, repeat from step 2).













ENGINE (DIAGNOSTICS)(H4DO) > List of Diagnostic Trouble Code (DTC)











LIST


DTC	Item	Note
B1570	ANTENNA	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1570 ANTENNA.
B1571	REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM)	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1571 REFERENCE CODE INCOMPATIBILITY.  Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1571 REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM).
B1572	IMM CIRCUIT EXCEPT ANTENNA CIRCUIT	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1572 IMM CIRCUIT EXCEPT ANTENNA CIRCUIT.  Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1572 IMM CIRCUIT EXCEPT ANTENNA CIRCUIT.
B1574	KEY COMMUNICATION	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1574 KEY COMMUNICATION.
B1575	INCORRECT IMMOBILIZER KEY	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1575 INCORRECT IMMOBILIZER KEY.
B1576	ECM EEPROM	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1576 EGI CONTROL MODULE EEPROM.  Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1576 EGI CONTROL MODULE EEPROM.
B1577	IMM CONTROL MODULE EEPROM	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1577 IMM CONTROL MODULE EEPROM.  Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1577 IMM CONTROL MODULE EEPROM.
B1578	METER	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1578 METER.














P000A	"A" CAMSHAFT POSITION SLOW RESPONSE BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P000A "A" CAMSHAFT POSITION SLOW RESPONSE BANK 1.
P000C	"A" CAMSHAFT POSITION SLOW RESPONSE BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P000C "A" CAMSHAFT POSITION SLOW RESPONSE BANK 2.
P0010	"A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0010 "A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1.
P0011	"A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0011 "A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1.
P0016	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR A	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0016 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR A.
P0018	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR A	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0018 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR A.
P0020	"A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0020 "A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2.
P0021	"A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0021 "A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2.
P0030	A/F / O2 HEATER CONTROL CIRCUIT BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0030 A/F / O2 HEATER CONTROL CIRCUIT BANK 1 SENSOR 1.
P0031	A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0031 A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 1.
P0032	A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0032 A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 1.
P0037	A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0037












		A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 2.
P0038	A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0038 A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 2.
P0068	MAP/MAF - THROTTLE POSITION CORRELATION	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0068 MAP/MAF - THROTTLE POSITION CORRELATION.
P0071	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" RANGE/PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0071 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" RANGE/PERFORMANCE.
P0072	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0072 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" LOW.
P0073	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0073 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" HIGH.
P0101	MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT RANGE/PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0101 MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT RANGE/PERFORMANCE.
P0102	MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0102 MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT LOW.
P0103	MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0103 MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT HIGH.
P0107	MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0107 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT LOW.
P0108	MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0108 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT HIGH.
P0111	INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0111 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE BANK 1.
P0112	INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0112 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW BANK 1.










P0113	INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0113 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH BANK 1.
P0116	ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0116 ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE.
P0117	ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0117 ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT LOW.
P0118	ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0118 ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT HIGH.
P0122	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW.
P0123	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH.
P0125	INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0125 INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL.
P0128	COOLANT THERMOSTAT (ENGINE COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE)	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0128 COOLANT THERMOSTAT (ENGINE COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE).
P0131	A/F / O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0131 A/F / O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 1.
P0132	A/F / O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0132 A/F / O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 1.
P0134	A/F / O2 SENSOR CIRCUIT NO ACTIVITY DETECTED BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0134 A/F / O2 SENSOR CIRCUIT NO ACTIVITY DETECTED BANK 1 SENSOR 1.
P0137	O2 SENSOR CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic
















	VOLTAGE BANK 1 SENSOR 2	Procedure with Diagnostic Trouble Code (DTC)>DTC P0137 O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 2.
P0138	O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DQ)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0138 O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 2.
P013A	O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DQ)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P013A O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2.
P013B	O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DQ)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P013B O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 2.
P013E	O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DQ)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P013E O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 2.
P013F	O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DQ)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P013F O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 2.
P0141	O2 SENSOR HEATER CIRCUIT BANK 1 SENSOR 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DQ)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0141 O2 SENSOR HEATER CIRCUIT BANK 1 SENSOR 2.
P014C	A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DQ)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P014C A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1.
P014D	A/F / O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DQ)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P014D A/F / O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 1.
P015A	A/F / O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DQ)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P015A A/F / O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 1.
P015B	A/F / O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DQ)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P015B A/F / O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 1.
P0171	SYSTEM TOO LEAN BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DQ)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0171 SYSTEM TOO LEAN BANK 1.
P0172	SYSTEM TOO RICH BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DQ)>Diagnostic

		Procedure with Diagnostic Trouble Code (DTC)>DTC P0172 SYSTEM TOO RICH BANK 1.
P0196	ENGINE OIL TEMPERATURE SENSOR "A" RANGE/PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0196 ENGINE OIL TEMPERATURE SENSOR "A" RANGE/PERFORMANCE.
P0197	ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0197 ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT LOW.
P0198	ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0198 ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT HIGH.
P0201	CYLINDER 1 INJECTOR "A" CIRCUIT	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0201 CYLINDER 1 INJECTOR "A" CIRCUIT.
P0202	CYLINDER 2 INJECTOR "A" CIRCUIT	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0202 CYLINDER 2 INJECTOR "A" CIRCUIT.
P0203	CYLINDER 3 INJECTOR "A" CIRCUIT	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0203 CYLINDER 3 INJECTOR "A" CIRCUIT.
P0204	CYLINDER 4 INJECTOR "A" CIRCUIT	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0204 CYLINDER 4 INJECTOR "A" CIRCUIT.
P0222	THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0222 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW.
P0223	THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0223 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT HIGH.
P0300	RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0300 RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED.
P0301	CYLINDER 1 MISFIRE DETECTED	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0301 CYLINDER 1 MISFIRE DETECTED.
P0302	CYLINDER 2 MISFIRE DETECTED	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0302 CYLINDER 2 MISFIRE DETECTED.
P0303	CYLINDER 3 MISFIRE DETECTED	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0303 CYLINDER 3 MISFIRE DETECTED.

P0304	CYLINDER 4 MISFIRE DETECTED	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0304 CYLINDER 4 MISFIRE DETECTED.
P0327	KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT LOW BANK 1 OR SINGLE SENSOR	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0327 KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT LOW BANK 1 OR SINGLE SENSOR.
P0328	KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT HIGH BANK 1 OR SINGLE SENSOR	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0328 KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT HIGH BANK 1 OR SINGLE SENSOR.
P0335	CRANKSHAFT POSITION SENSOR "A" CIRCUIT	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT.
P0336	CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0336 CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE.
P0340	CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 1 OR SINGLE SENSOR	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 1 OR SINGLE SENSOR.
P0341	CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 1 OR SINGLE SENSOR	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0341 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 1 OR SINGLE SENSOR.
P0345	CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0345 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 2.
P0346	CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0346 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 2.
P0351	IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN.
P0352	IGNITION COIL "B" PRIMARY CONTROL CIRCUIT/OPEN	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0352 IGNITION COIL "B" PRIMARY CONTROL CIRCUIT/OPEN.
P0353	IGNITION COIL "C" PRIMARY CONTROL CIRCUIT/OPEN	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0353 IGNITION COIL "C" PRIMARY CONTROL CIRCUIT/OPEN.
P0354	IGNITION COIL "D" PRIMARY CONTROL CIRCUIT/OPEN	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0354

		IGNITION COIL "D" PRIMARY CONTROL CIRCUIT/OPEN.
P0400	EGR "A" FLOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0400 EGR "A" FLOW.
P0420	CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0420 CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD BANK 1.
P0441	EVAP SYSTEM (CPC) INCORRECT PURGE FLOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0441 EVAP SYSTEM (CPC) INCORRECT PURGE FLOW.
P0451	EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT RANGE/PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0451 EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT RANGE/PERFORMANCE.
P0452	EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0452 EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT LOW.
P0453	EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0453 EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT HIGH.
P0455	EVAP SYSTEM (CPC) LEAK DETECTED (LARGE LEAK)	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0455 EVAP SYSTEM (CPC) LEAK DETECTED (LARGE LEAK).
P0456	EVAP SYSTEM (CPC) LEAK DETECTED (VERY SMALL LEAK)	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0456 EVAP SYSTEM (CPC) LEAK DETECTED (VERY SMALL LEAK).
P0458	EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0458 EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT LOW.
P0459	EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0459 EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT HIGH.
P0500	VEHICLE SPEED SENSOR "A" CIRCUIT	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0500 VEHICLE SPEED SENSOR "A" CIRCUIT.
P0506	IDLE CONTROL SYSTEM RPM - LOWER THAN EXPECTED	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0506 IDLE CONTROL SYSTEM RPM - LOWER THAN EXPECTED.
P0507	IDLE CONTROL SYSTEM RPM - HIGHER THAN EXPECTED	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0507














		IDLE CONTROL SYSTEM RPM - HIGHER THAN EXPECTED.
P050A	COLD START IDLE CONTROL SYSTEM PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P050A COLD START IDLE CONTROL SYSTEM PERFORMANCE.
P050B	COLD START IGNITION TIMING PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P050B COLD START IGNITION TIMING PERFORMANCE.
P0512	STARTER (SWITCH) REQUEST CIRCUIT	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0512 STARTER (SWITCH) REQUEST CIRCUIT.
P0560	SYSTEM VOLTAGE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0560 SYSTEM VOLTAGE.
P0562	SYSTEM VOLTAGE LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0562 SYSTEM VOLTAGE LOW.
P0563	SYSTEM VOLTAGE HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0563 SYSTEM VOLTAGE HIGH.
P0604	INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR.
P0605	INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0605 INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR.
P0606	CONTROL MODULE PROCESSOR	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0606 CONTROL MODULE PROCESSOR.
P060A	INTERNAL CONTROL MODULE MONITORING PROCESSOR PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P060A INTERNAL CONTROL MODULE MONITORING PROCESSOR PERFORMANCE.
P060B	INTERNAL CONTROL MODULE A/D PROCESSING PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P060B INTERNAL CONTROL MODULE A/D PROCESSING PERFORMANCE.
P0616	STARTER RELAY "A" CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0616 STARTER RELAY "A" CIRCUIT LOW.
P0617	STARTER RELAY "A" CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0617 STARTER RELAY "A" CIRCUIT HIGH.


P062F	INTERNAL CONTROL MODULE EEPROM ERROR	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P062F INTERNAL CONTROL MODULE EEPROM ERROR.
P0685	ECM/PCM POWER RELAY CONTROL CIRCUIT/OPEN	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0685 ECM/PCM POWER RELAY CONTROL CIRCUIT/OPEN.
P0700	TRANSMISSION CONTROL SYSTEM (MIL REQUEST)	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0700 TRANSMISSION CONTROL SYSTEM (MIL REQUEST).
P081A	STARTER DISABLE CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P081A STARTER DISABLE CIRCUIT LOW.
P0851	PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0851 PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW.
P0852	PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0852 PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH.
P1160	THROTTLE RETURN SPRING	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1160 THROTTLE RETURN SPRING.
P1449	EVAP SYSTEM CLOG DETECTED (AIR FILTER)	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1449 EVAP SYSTEM CLOG DETECTED (AIR FILTER).
P1451	EVAP SYSTEM CLOG DETECTED (PIPE)	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1451 EVAP SYSTEM CLOG DETECTED (PIPE).
P1492	COIL 1 EGR "A" CONTROL CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1492 COIL 1 EGR "A" CONTROL CIRCUIT LOW.
P1493	COIL 1 EGR "A" CONTROL CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1493 COIL 1 EGR "A" CONTROL CIRCUIT HIGH.
P1494	COIL 2 EGR "A" CONTROL CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1494 COIL 2 EGR "A" CONTROL CIRCUIT LOW.
P1495	COIL 2 EGR "A" CONTROL CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1495 COIL 2 EGR "A" CONTROL CIRCUIT HIGH.
P1496	COIL 3 EGR "A" CONTROL CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1496 COIL 3 EGR "A" CONTROL CIRCUIT LOW.
P1497	COIL 3 EGR "A" CONTROL CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1497

		COIL 3 EGR "A" CONTROL CIRCUIT HIGH.
P1498	COIL 4 EGR "A" CONTROL CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1498 COIL 4 EGR "A" CONTROL CIRCUIT LOW.
P1499	COIL 4 EGR "A" CONTROL CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1499 COIL 4 EGR "A" CONTROL CIRCUIT HIGH.
P1C00	BATTERY MONITOR MODULE "A" PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1C00 BATTERY MONITOR MODULE "A" PERFORMANCE.
P2004	TGV CONTROL STUCK OPEN BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2004 TGV CONTROL STUCK OPEN BANK 1.
P2005	TGV CONTROL STUCK OPEN BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2005 TGV CONTROL STUCK OPEN BANK 2.
P2006	TGV CONTROL STUCK CLOSED BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2006 TGV CONTROL STUCK CLOSED BANK 1.
P2007	TGV CONTROL STUCK CLOSED BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2007 TGV CONTROL STUCK CLOSED BANK 2.
P2008	TGV CONTROL CIRCUIT/OPEN BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2008 TGV CONTROL CIRCUIT/OPEN BANK 1.
P2009	TGV CONTROL CIRCUIT LOW BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2009 TGV CONTROL CIRCUIT LOW BANK 1.
P2011	TGV CONTROL CIRCUIT/OPEN BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2011 TGV CONTROL CIRCUIT/OPEN BANK 2.
P2012	TGV CONTROL CIRCUIT LOW BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2012 TGV CONTROL CIRCUIT LOW BANK 2.
P2016	TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2016 TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 1.
P2017	TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2017 TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 1.
P2021	TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2021 TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 2.
P2022	TGV POSITION	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic

	SENSOR/SWITCH CIRCUIT HIGH BANK 2	Procedure with Diagnostic Trouble Code (DTC)>DTC P2022 TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 2.
P2096	POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2096 POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1.
P2097	POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2097 POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1.
P2101	THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2101 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE.
P2102	THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2102 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT LOW.
P2103	THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2103 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT HIGH.
P2109	THROTTLE/PEDAL POSITION SENSOR "A" MINIMUM STOP PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2109 THROTTLE/PEDAL POSITION SENSOR "A" MINIMUM STOP PERFORMANCE.
P2119	THROTTLE ACTUATOR "A" CONTROL THROTTLE BODY RANGE/PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2119 THROTTLE ACTUATOR "A" CONTROL THROTTLE BODY RANGE/PERFORMANCE.
P2122	THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT LOW.
P2123	THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH.
P2127	THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2127 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW.
P2128	THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2128 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH.
P2135	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B"	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2135

	VOLTAGE CORRELATION	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE CORRELATION.
P2138	THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE CORRELATION	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2138 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE CORRELATION.
P2195	A/F /O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2195 A/F /O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 1.
P2196	A/F /O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2196 A/F /O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 1.
P219C	CYLINDER 1 AIR-FUEL RATIO IMBALANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P219C CYLINDER 1 AIR-FUEL RATIO IMBALANCE.
P219D	CYLINDER 2 AIR-FUEL RATIO IMBALANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P219D CYLINDER 2 AIR-FUEL RATIO IMBALANCE.
P219E	CYLINDER 3 AIR-FUEL RATIO IMBALANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P219E CYLINDER 3 AIR-FUEL RATIO IMBALANCE.
P219F	CYLINDER 4 AIR-FUEL RATIO IMBALANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P219F CYLINDER 4 AIR-FUEL RATIO IMBALANCE.
P2270	O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2270 O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 2.
P2271	O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2271 O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 2.
P2401	EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2401 EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT LOW.
P2402	EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2402 EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT HIGH.
P2404	EVAP SYSTEM LEAK DETECTION PUMP SENSE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2404

	CIRCUIT RANGE/PERFORMANCE	EVAP SYSTEM LEAK DETECTION PUMP SENSE CIRCUIT RANGE/PERFORMANCE.
P2419	EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2419 EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT LOW.
P2420	EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2420 EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT HIGH.
P2530	IGNITION SWITCH RUN POSITION CIRCUIT	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2530 IGNITION SWITCH RUN POSITION CIRCUIT.
P2610	ECM/PCM ENGINE OFF TIMER PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2610 ECM/PCM ENGINE OFF TIMER PERFORMANCE.
U0073	CONTROL MODULE COMMUNICATION BUS "A" OFF	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS "A" OFF.
U0077	LIN COMMUNICATION BUS "ECM/PCM" OFF	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0077 LIN COMMUNICATION BUS "ECM/PCM" OFF.
U0101	LOST COMMUNICATION WITH TCM	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0402	INVALID DATA RECEIVED FROM TCM	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0402 INVALID DATA RECEIVED FROM TCM.
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.
U1712	LOST LIN COMMUNICATION WITH BATTERY "1" MONITOR	 Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1712


	MODULE	LOST LIN COMMUNICATION WITH BATTERY "1" MONITOR MODULE.
U171F	LOST LIN COMMUNICATION WITH GENERATOR	 Ref. to ENGINE (DIAGNOSTICS)(H4DQ)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U171F LOST LIN COMMUNICATION WITH GENERATOR.

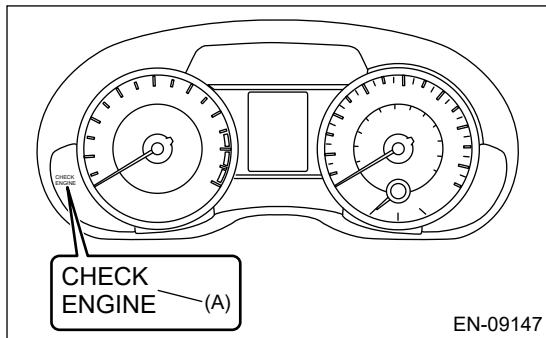
ENGINE (DIAGNOSTICS)(H4DO) > Malfunction Indicator Light

ACTIVATION OF MALFUNCTION INDICATOR LIGHT

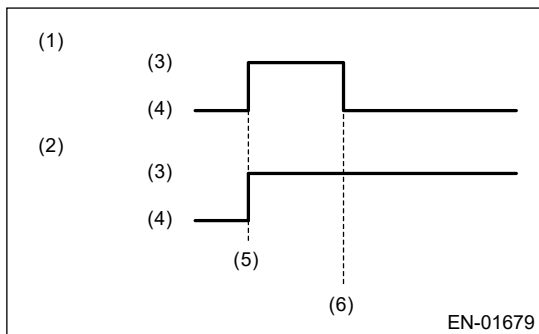
1. When the ignition switch is turned to ON (engine OFF), the malfunction indicator light (A) in the combination meter illuminates.

Note:

If the malfunction indicator light does not illuminate, perform diagnostics of the malfunction indicator light circuit or the combination meter circuit.  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Malfunction Indicator Light>MALFUNCTION INDICATOR LIGHT DOES NOT COME ON.

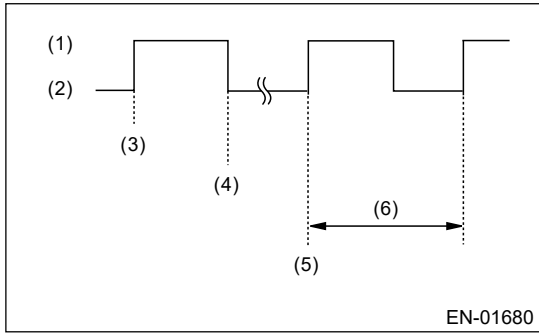


2. After starting the engine, the malfunction indicator light goes out. If it does not go off, any of the engine and emission control system has malfunction.



- (1) No faulty
- (2) Trouble occurs
- (3) ON
- (4) OFF
- (5) Ignition switch ON
- (6) Engine start

3. If the diagnostic system detects a misfire which could damage the catalyst, the malfunction indicator light will blink at a cycle of 1 Hz.



- (1) ON
- (2) OFF
- (3) Ignition switch ON
- (4) Engine start
- (5) Misfire start
- (6) 1 second

ENGINE (DIAGNOSTICS)(H4DO) > Malfunction Indicator Light

MALFUNCTION INDICATOR LIGHT DOES NOT COME ON

Trouble symptom:

When the ignition switch is turned to ON (engine OFF), malfunction indicator light does not illuminate.

Note:

For the diagnostic procedure, refer to Combination Meter section.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Malfunction Indicator Light


MALFUNCTION INDICATOR LIGHT DOES NOT GO OFF

Trouble symptom:



Although malfunction indicator light comes on when the engine runs, DTC is not shown on the Subaru Select Monitor or general scan tool display.

1. CHECK DTC.




Is DTC of engine or LAN system displayed?  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)

Yes


Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Check the combination meter system.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

ENGINE (DIAGNOSTICS)(H4DO) > Malfunction Indicator Light

PROCEDURE

1. Activation of malfunction indicator light.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Malfunction Indicator Light>ACTIVATION OF MALFUNCTION INDICATOR LIGHT.](#)



2. Malfunction indicator light does not come on.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Malfunction Indicator Light>MALFUNCTION INDICATOR LIGHT DOES NOT COME ON.](#)



3. Malfunction indicator light does not go off  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Malfunction Indicator Light>MALFUNCTION INDICATOR LIGHT DOES NOT GO OFF.](#)


ENGINE (DIAGNOSTICS)(H4DO) > Read Diagnostic Trouble Code (DTC)

OPERATION

1. SUBARU SELECT MONITOR


1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Engine Control System] and select [Enter].
5. On [Select Function] display, select [DTC].

Note:

- For detailed operation procedures, refer to "PC application help for Subaru Select Monitor".
- For details concerning DTC, refer to "List of Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

2. GENERAL SCAN TOOL

Refer to data denoting emission-related powertrain DTC.

For details concerning DTC, refer to "List of Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>List of Diagnostic Trouble Code \(DTC\).](#)

Note:

Refer to general scan tool manufacturer's instruction manual to access powertrain DTC (MODE \$03).

OPERATION**1. HOW TO USE SUBARU SELECT MONITOR****Note:**

For detailed operation procedures, refer to "Application help".

2. DATA MONITOR**Note:**

- For detailed operation procedures, refer to "PC application help for Subaru Select Monitor".
- A list of the support data is shown in the following table.
- *: For models without cruise control, the brake switch signal does not change.

1. On [Start] display, select [Diagnosis].

2. On [Vehicle selection] display, enter vehicle information and select [OK].

3. On [Main Menu] display, select [Each System].

4. On [Select System] display, select [Engine Control System] and select [Enter].

5. On [Select Function] display, select [Data monitor].

Item	Contents	Note (at idling)	Remarks
Engine Speed	Value calculated from crankshaft position sensor output value.	650 rpm	rpm
Air Flow Rate from Mass Air Flow Sensor	Value calculated from air flow sensor output value.	2.5 g/s	g/s or lb/m
Vehicle Speed Sensor	Value calculated from vehicle speed sensor output value.	0 km/h	km/h or MPH
Throttle Opening Angle	Throttle valve opening angle (in percentage) calculated from throttle position sensor output value.	13%	%
Accel. Opening Angle	Accelerator pedal opening angle (in percentage) calculated from accelerator pedal position sensor output value.	0.0%	%
A/F Sensor #1	Actual lambda value calculated from front oxygen (A/F) sensor output value.	1.00	—
Ignition Timing Advance for #1 Cylinder	Ignition timing control value for No. 1 cylinder. Calculated from rotation speed, manifold pressure, intake air temperature, water temperature, and data from knock sensor etc.	15.5°	°
Coolant Temp.	Value calculated from engine coolant temperature sensor output value.	96°C	°C or °F
Fuel Injection #1 Pulse	Control value of fuel injection time for the RH bank by ECM.	2.56 ms	ms
Short Term Fuel Trim (B1)	Air fuel ratio correction control value for the front oxygen (A/F) sensor.	0.8%	%
Long Term Fuel Trim (B1)	Air fuel ratio learning control value for the front oxygen (A/F) sensor.	1.6%	%

Learned Ignition Timing	Ignition timing learning value. Advance angle amount or retard angle amount when knocking occurs.	0.0 deg	deg
Mani. Absolute Pressure	Value calculated from the manifold pressure sensor.	32 kPa	kPa, mmHg, inHg or psig
Bank 1 - Sensor 2 present at that location	Rear oxygen sensor output voltage value.	0.7 V	V
VVT Adv. Ang. Amount R	AVCS advance angle amount for the RH bank on the intake side.	0 deg	deg
VVT Advance Target Angle Amount R	AVCS target advance angle amount for the RH bank on the intake side. This value is compared with the AVCS advance angle amount R to judge if the intake AVCS is operating properly. Response delays during the transition time.	0 deg	deg
VVT Adv. Ang. Amount L	AVCS advance angle amount for the LH bank on the intake side.	0 deg	deg
VVT Advance Target Angle Amount L	AVCS target advance angle amount for the LH bank on the intake side. This value is compared with the AVCS advance angle amount L to judge if the intake AVCS is operating properly. Response delays during the transition time.	0 deg	deg
VVT Initial Position Learning Value #1	AVCS initial position learning value for the RH bank on the intake side. Controls the angle against a standard angle. Deviation learning is performed based on this standard value.	10 – 50°C	°C
VVT Initial Position Learning Value #2	AVCS initial position learning value for the LH bank on the intake side. Controls the angle against a standard angle. Deviation learning is performed based on this standard value.	10 – 50°C	°C
Control module voltage	ECM input power supply voltage.	14.176 V	V
Target engine speed	ECM target engine speed.	650 rpm	rpm
Target Equivalence Ratio	Target air fuel ratio (lambda). It usually becomes 1.0 aiming at a theoretical air fuel ratio.	0.996	—
Oil Temperature	Value calculated from the engine oil temperature sensor output value.	96°C	°C or °F
Intake Air Temp.	Value calculated from the intake air temperature sensor output value.	50°C	°C or °F
Ambient air temperature	Value that ECM estimates by using input values from the engine coolant temperature	—	Celsius

	sensor or the intake air temperature sensor etc.		
Ambient Temperature Sensor Signal	Data value of the ambient temperature input to the combination meter via CAN. Ambient temperature used for diagnosis.	—	°C or °F
Calculated LOAD Value	Current rate of air amount. Value assuming that the air amount at the current engine speed with the throttle fully open is 100%.	15.3%	%
Absolute Load Value	Percentage of current intake air amount against the maximum air intake amount of the engine. For non-turbo engine, the value can be close to 95%, but will never be 100%. For turbo engine, this value may exceed 100% due to a boost pressure.	14.9%	%
Barometric Pressure	Value calculated from atmospheric pressure sensor output value.	101 kPa	kPa, mmHg, inHg or psig
Mani. Relative Pressure	Value calculated from manifold pressure sensor output value. (Absolute value) (Air intake absolute pressure – Atmospheric pressure)	(Air intake absolute pressure – Atmospheric pressure)	kPa, mmHg, inHg or psig
Target Throttle Opening Angle	Target throttle opening angle calculated by ECM.	16 deg	deg
Actual Throttle Opening Angle	Actual throttle opening angle. Calculated by ECM based on the throttle sensor input value.	16 deg	deg
Commanded Throttle Actuator Control	Control value of the target throttle opening angle calculated by ECM. Target value of opening angle in percentage when 0% means fully closed and 100% means fully open.	0.0%	%
Relative Throttle Position	Current throttle opening angle in percentage against the throttle voltage (full range) that has reflected the full close point learning value. The value will be approx. 70% at full open.	1.6%	%
Throttle Motor Voltage	Power supply voltage of the throttle motor. Input value to ECM.	14.2 V	V
Main-Throttle Sensor	Voltage value of the main throttle position sensor. Input value to ECM.	0.66 V	V
Sub-Throttle Sensor	Voltage value of the sub throttle position sensor. Input value to ECM.	1.52 V	V
Throttle Motor Duty	Throttle motor control duty ratio. ECM output value.	–14%	%

Main-Accelerator Sensor	Voltage value of the main accelerator pedal position sensor. Input value to ECM.	0.66 V	V
Sub-Accelerator Sensor	Voltage value of the sub accelerator pedal position sensor. Input value to ECM.	0.66 V	V
Idle Mass Air Flow	Air volume correction value to maintain the target rotation speed in each water temperature. Corrects air volume when the water temperature changes. It includes values of the feedback correction amount and the learning value.	3.00 g/s	g/s
Idle Mass Air Flow Feedback correct	Air volume compensation value of ISC as a feedback correction to stabilize the idling speed.	0.00 g/s	g/s
ISC Learning Value	Learning control value of ISC. After warming up, learning control is executed to reduce the ISC feedback correction to zero, in order to stabilize the engine speed.	0.55 g/s	g/s
Idle A/C load correct	Air volume correction when the air conditioner is turned on. ECM corrects the air volume against the target rotation speed when the air conditioner is turned ON.	0.86 g/s	g/s
Electric Load Feedback Val	Air volume correction value when an electric load is turned on. ECM corrects the air volume against the set target rotation speed when the electric load is turned ON.	0 g/s	g/s
Idle dirty throttle correct	Calculates the ISC learning values on a long-term basis, and judges as an ISC dirty throttle correction when the learning value increases gradually. When carbon or other dirt accumulates on the ISC throttle and make the throttle dirty, air volume decreases when the throttle is fully closed. The ECM increases the amount of compensation air to keep the rotation speed.	0 g/s	g/s
Air Flow Sensor Voltage	Air flow sensor output value. Input value to ECM.	1.2 V	V
Fuel Level Input	Fuel level sensor output value. Input value to ECM. Total value of main and sub.	—	%
Fuel level resistance	Fuel level sensor resistance value. Input value to ECM.	—	Ω
Commanded Evaporative Purge	Evaporative purge rate displayed by the OBD.	0%	%

CPC Valve Duty Ratio	Purge control solenoid valve control duty ratio. ECM output value.	0%	%
Purge Density Learn Value	Leaning value of the evaporation gas density purged from the canister. ECM displays the estimated leaning value.	0.0 %	%
Evap Purge Flow	Purge ratio when the evaporation gas is purged from the canister. ECM performs a duty drive to the purge solenoid valve. The amount of gas actually purged will vary depending on the vacuum pressure difference before/after the solenoid valve. Purge ratio displayed here shows current purge amount in percentage against the maximum purge amount when the maximum vacuum pressure is applied.	0.0 %	%
ALT Duty	Value calculated by the ECM as an electric power generation voltage. Indicator voltage value from ECM to alternator is under a duty control.	0%	%
Alternator control mode	Control mode of the electric power generation voltage by the alternator. Low: Mode that controls the battery charge Mid: Mode where the battery is not charged and discharged High: Mode that fixes the voltage when the battery is charged or when an electric load is turned on ExHigh: Mode where the battery is charged during deceleration Smart: Mode that maintains target SOC and restrains unnecessary power generation Low (Start): Mode that gradually increases the voltage at start Low (Acceleration): Mode that suppresses power generation load when slightly stronger acceleration was judged	High/Mid/Smart	—
Battery Terminal Voltage	Voltage value between battery terminals input from the battery sensor.	0.0 deg	V
Battery Charge/Discharge Current	Battery charge/discharge current value input from the battery sensor. When the value is positive: The current flows to a direction that the battery is charged. When the value is negative: The current flows to a direction that the battery is discharged.	0.0 deg	A
Estimated Battery Temperature	Battery temperature input from the battery sensor.	0.0 deg	°C or °F
Remaining battery	Remaining amount of battery estimated by	0.0 deg	%

capacity	ECM.		
Knocking Correction	Retard angle amount when knocking occurs. Partially learning value of ignition timing learning value.	0.0 deg	deg
Fuel system for Bank 1	Feedback status of air fuel ratio. Open: Feedback is stopped Closed: Feedback control is being performed	Cl_normal	—
Fuel system for Bank 2	Feedback status of air fuel ratio. Open: Feedback is stopped Closed: Feedback control is being performed	Cl_normal	—
A/F Sensor #1 Current	Front oxygen (A/F) sensor output current value. Input value to ECM.	0.00 mA	mA
A/F Sensor #1 Resistance	Value calculated from the front oxygen (A/F) sensor output value.	50 Ω	Ω
A/F Correction #3	Sub correction value of A/F feedback control.	0.00%	%
No. of EGR steps	Number of EGR valve steps. Number of stepping motor steps. ECM output value.	0 STEP	STEP
Commanded EGR	Target value as EGR setting value calculated by ECM.	0%	%
EGR Error	Percentage of the difference in actual EGR steps as compared to the target EGR steps. Both a positive value and a negative value mean that it doesn't fulfill the target. When the value is positive: It opens more than the target value. When the value is negative: It opens smaller than the target value.	0%	%
TGV Position Sensor R	Tumble generator valve position sensor RH output value. Input value to ECM.	3.12 V	V
TGV Position Sensor L	Tumble generator valve position sensor LH output value. Input value to ECM.	0.82 V	V
TGV Output	Drive signal to tumble generator valve motor. Set to "ON" when the tumble generator valve is activated (when the duty output is other than 0%). ECM output value.	None	—
TGV Drive	Tumble generator valve drive status. Set to "Open" when the tumble generator valve is open. ECM control status.	Closing direction	—
OCV Duty R	Control duty ratio of the intake side oil control solenoid on the RH bank. ECM output value.	55.3%	%
OCV Duty L	Control duty ratio of the intake side oil control	56.1%	%

	solenoid on the LH bank. ECM output value.		
OCV Current R	Actual current value of the intake side oil control solenoid on the RH bank. Input value to ECM.	736 mA	mA
OCV Current L	Actual current value of the intake side oil control solenoid on the LH bank. Input value to ECM.	768 mA	mA
Roughness Monitor #1	#1 cylinder roughness monitor count value.	0	—
Roughness Monitor #2	#2 cylinder roughness monitor count value.	0	—
Roughness Monitor #3	#3 cylinder roughness monitor count value.	0	—
Roughness Monitor #4	#4 cylinder roughness monitor count value.	0	—
Cylinder Monitor #1	Calculates the rotation speed between certain angles on the #1 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	—	rpm
Cylinder Monitor #2	Calculates the rotation speed between certain angles on the #2 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	—	rpm
Cylinder Monitor #3	Calculates the rotation speed between certain angles on the #3 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	—	rpm
Cylinder Monitor #4	Calculates the rotation speed between certain angles on the #4 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	—	rpm
Trip Count	Time stamp information. Number of times the ignition is ON since the vehicle was manufactured. The number of ignition ON is also recorded when a trouble code is recorded, so the comparison with that number will show you how many times the ignition has turned on since the diagnostic code was recorded.	—	Time
Count	Time stamp information.	Common	—

	Each unit individually counts the elapsed time since the ignition is turned to ON. Master integrated unit and ECM synchronize with the master time. When synchronized: "Common" When not synchronized: "Originally"		
Time Count	Time stamp information. Elapsed time after ignition ON. When a trouble code is recorded, the elapsed time after ignition ON is also recorded.	—	ms
Time Since Engine Start	Elapsed time after starting the engine.	—	sec
Timer after start	Elapsed time after starting the engine. This value is used for control.	—	sec
Accumulation Time After Engine Run	Cumulative time after starting the engine. For models with Auto Start Stop, cumulative time after the first engine start. Time is not accumulated while the engine stops due to the Auto Start Stop system.	—	sec
Initial Engine Oil Temp	Oil temperature when starting the engine, which is input to ECM from the oil temperature sensor.	—	Celsius
Initial Engine Coolant Temp.	Water temperature when starting the engine, which is input to ECM from the water temperature sensor.	—	Celsius
Initial Intake Air Temp.	Intake air temperature when starting the engine, which is input to ECM from the intake air temperature sensor.	—	Celsius
Engine Starting Time	Time needed since the cranking started till the judgment of engine start is complete.	0 min	ms
Start Mask Control Check 1	Information that shows whether the start prohibition control is executed on the engine side when starting. Values other than zero means that the control is executed and the engine start is prohibited.	—	—
IG OFF Elapsed Time	The time the vehicle has been left since the engine stopped. Shows the elapsed time after turning OFF the ignition switch.	—	sec
Distance traveled since DTC(s) cleared	Travel distance after DTC clear.	—	km or mile
Engine run time while MIL is illuminated	Engine operating time from when the malfunction indicator light illuminated till when it went off.	—	min
Engine run time since DTC(s) cleared	Elapsed time after DTC clear.	—	min

Number of Warm-ups since DTC(s) cleared	Number of warm ups after DTC clear. 1 cycle is the time from the cold start till warmed up and stop. (Engine start after a warm-up is not counted.)	—	Time
Distance Traveled While MIL is Illuminated	Travel distance after the warning light illuminated.	—	km or mile
Odometer	Value of the total cumulative travel distance that ECM calculates from the vehicle speed separately from the odometer in the combination meter. Small difference from the odometer will be possible, but if there is a big difference, ECM or the combination meter may need to be replaced.	—	km or mile
Maximum Engine Speed at the time of Misfire detection caused by out of Fuel	Maximum engine speed during fuel cut by a fuel run-out judgment.	0 rpm	rpm
Maximum Intake Air Amount at the time of Misfire detection caused by out of Fuel	Maximum air amount during fuel cut by a fuel run-out judgment.	0 g/s	g/s
Number of Misfire detection caused by out of Fuel	Number of the occurrences of fuel run-out judgment.	0 times	Time
Estimated Total Mileage at the time of first Misfire detection caused by out of Fuel	Estimated cumulative travel distance during fuel cut by a fuel run-out judgment.	0 km/h	km/h or MPH
Fuel Cut Elps Time	Elapsed time after experienced high rotation speed.	0 sec	sec
Memorized Cruise Speed	Cruise control system target vehicle speed. (Set speed)	0 km/h	km/h or MPH
Catalyst Temperature (B1-S1)	Estimated temperature of the front catalytic converter.	305.1°C	Celsius
Type of fuel currently being utilized by the vehicle	Fuel information recorded in the ECM. Not the fuel information currently used.	GAS	—
Auto Trans Neutral Drive Status	Neutral condition. Information input from the inhibitor switch. (CVT model)	NEUT	—
Manual Trans Neutral Gear Status	Neutral condition.	NEUT	—

	Information input from the neutral switch. (MT model)		
Evap System Vapor Pressure	Evaporative emission control system pressure value. Pressure sensor output value.	99 kPa	kPa, mmHg, inHg or psig
X mode	X mode ON or OFF status.	OFF	—
Neutral Position Switch	Neutral switch signal. Signal when in neutral (MT) or in P or N range (AT). Input value to ECM.	Neutral	—
ETC Motor Relay	Drive signal to the electronic throttle motor relay. Set to "ON" when the drive signal is output. ECM output value.	ON	—
Clutch Switch	Clutch switch signal. Set to "ON" when the clutch switch is ON. (MT model) Input value to ECM.	OFF	—
Stop Light Switch	Stop light switch signal. Set to "ON" when the stop light illuminates. Input value to ECM.	OFF (when OFF)	—
Brake Switch	Brake switch signal. Set to "ON" when the brake pedal is depressed. Input value to ECM.	*OFF (when OFF)	—
Idle Switch Signal	Idle signal. Set to "Idle" while idling.	At idle	—
Ignition Switch	Ignition switch signal. Set to "ON" when the ignition switch is ON.	ON input	—
A/C Mid Pressure Switch	Air conditioner middle pressure switch signal. Set to "ON" when the switch is ON. Input value to ECM.	OFF input (at OFF)	—
A/C Compressor Signal	A/C compressor drive signal. Set to "ON output" when the drive signal is output. ECM output value.	OFF output (when OFF)	—
Radiator Fan Relay #1	Radiator fan relay drive signal. Set to "ON" when the drive signal is output. ECM output value.	OFF output (when OFF)	—
Radiator Fan Relay #2	Radiator fan relay drive signal. Set to "ON" when the drive signal is output. ECM output value.	OFF output (when OFF)	—
A/C Switch	Air conditioner switch signal. Set to "ON" when the air conditioner switch of the heater control is ON. Input value to ECM.	OFF input (at OFF)	—
Starter Switch	Starter switch signal. Set to "ON" when the starter is ON.	OFF input	—

	Input value to ECM.		
Rear Defogger SW	Rear defogger switch input signal. Set to "ON" when the switch is ON. Input value to ECM.	OFF input (at OFF)	—
Blower Fan SW	Blower fan switch input signal. Set to "ON" when the switch is ON. Input value to ECM.	OFF input (at OFF)	—
Light Switch	Light switch input signal. Set to "ON" when the switch is ON. Input value to ECM.	OFF input (at OFF)	—
Front Fog Light Switch	Front fog light switch input signal. Set to "ON" when the switch is ON. Input value to ECM.	OFF input (at OFF)	—
Wiper Switch	Wiper switch input signal. Set to "ON" when the switch is ON. Input value to ECM.	OFF input (at OFF)	—
Delivery Mode Connector	Delivery mode terminal fuse installation status. Shows the status of delivery mode.	OFF	—
Rear O2 Rich Signal	Rear oxygen sensor output value. Displays "Rich" when the air fuel ratio of rear oxygen sensor is rich. Displays "Lean" when the air fuel ratio of rear oxygen sensor is lean.	Rich/Lean	—
Knocking Signal	Knock sensor output signal. Judges if a knocking occurs or not. Input value to ECM.	None	—
Crankshaft Position Sig.	Crankshaft position sensor output signal. Set to "ON" when the engine is running. Input value to ECM.	ON	—
Camshaft Position Sig.	Camshaft position sensor output signal. Set to "ON" when the engine is running. Input value to ECM.	ON	—
Ban of Torque Down	Torque down prohibition notification signal to the vehicle dynamics control (VDC) module. Set to "OFF" when the prohibition signal is output. ECM output value.	ON	—
Request Torque Down VDC	Torque down request signal transmitted from the vehicle dynamics control (VDC) module. Set to "ON" when the request signal is sent. Input value to vehicle dynamics control (VDC) module.	None	—
Torque Permission Signal	Torque down permission notification signal to the transmission control module. Set to "ON" when the permission signal is output. ECM output value.	Allowed (prohibited on MT vehicles)	—

SET/COAST Switch	Cruise control system SET/COAST SW signal. Set to "ON" when the switch is operated. Input value to ECM.	OFF (when OFF)	—
RESUME/ACCEL Switch	Cruise control system RESUME/ACCEL SW signal. Set to "ON" when the switch is operated. Input value to ECM.	OFF (when OFF)	—
Main Switch	Cruise control system main switch signal. Set to "ON" when the switch is operated. Input value to ECM.	OFF (when OFF)	—
distance change SW	Distance change switch signal. Displayed only on models with EyeSight.	OFF (when OFF)	—
CC Cancel SW	Cruise control cancel switch signal of the cruise control system. Set to "ON" when the switch is operated. Input value to ECM.	OFF (when OFF)	—
Fuel Pump Relay	Fuel pump relay drive signal. Set to "ON" when the drive signal is output. ECM output value.	ON output	—
All Cylinders Fuel cut	Status under the fuel injection amount control where the fuel injection is cut off in all cylinders.	OFF	—
Immobilizer Fuel Cut Status	Status where the fuel injection is cut off by the command from immobilizer.	OFF	—
Shift Pattern Demand for Low Water Temperature	Shift pattern request sent from ECM to the transmission CM. When the water temperature is low, shift pattern change to the low speed side is requested to raise the catalyst temperature faster.	OFF	—
Oil level switch	Oil level switch signal. Set to "LOW level" when the amount of engine oil decreases. Input value to ECM.	HIGH level	—
ELCM switching valve	Leak check valve assembly switching valve drive signal. Set to "Close" when closing the switching valve. ECM output value.	Open	—
ELCM pump	Leak check valve assembly pump drive signal. Set to "ON" when the leak check valve assembly decompression pump is activated. ECM output value.	OFF	—
AT turbine speed	Turbine rotation speed of the transmission. Turbine rotation speed is input from the transmission CM via CAN. (CVT model)	900	—
Lock up status	Lock-up status of the transmission. Lock up status is input from the transmission CM via CAN. (CVT model)	OPEN	—

P/N Signal	P/N status of the transmission. P/N range status is input from the transmission CM via CAN. (CVT model)	—	—
Ignition Control Check 1	Detailed status of the engine ignition control information.	90	—
Ignition Control Check 2	Detailed status of the engine ignition control information.	75	—
Alternator control check 1	Detailed status of charge control.	93	—
Alternator control check 2	Detailed status of charge control.	92.3	—
Alternator control check 3	Detailed status of charge control.	8.9	—
Alternator control check 4	Detailed status of charge control.	7.7	—
Alternator control check 5	Detailed status of charge control.	100	—
Alternator control check 6	Detailed status of charge control.	1	—
Alternator control check 7	Detailed status of charge control.	14.3	—
Alternator control check 8	Detailed status of charge control.	0	—
Alternator control check 9	Detailed status of charge control.	0	—
Alternator control check 10	Detailed status of charge control.	0	—
Imbalance Check 1 #1	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	0	—
Imbalance Check 1 #2	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	0	—
Imbalance Check 1 #3	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	0	—
Imbalance Check 1 #4	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	0	—
Alternator Mechanical Error Status	Status where alternator is judged as having mechanical trouble.	0	—
Alternator Electrical Output Error Status	Status where alternator is judged as having electric abnormality.	0	—
Alternator High Temperature Error Status	Status where alternator is judged as having high temperature malfunction.	0	—

Alternator Communication Error Status	Status where alternator is judged as having communication failure.	0	—
Regulator Temperature	Alternator regulator temperature.	0	—
Imbalance Check 2 #1	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	0	—
Imbalance Check 2 #2	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	0	—
Imbalance Check 2 #3	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	0	—
Imbalance Check 2 #4	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	0	—
Imbalance Check 3 R	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	0	—
Imbalance Check 4 R	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	0	—
Malfunction Indicator Lamp (MIL) Status	Malfunction indicator light illumination status. When judged as abnormal, an illumination command signal is sent from ECM to the combination meter.	OFF	—
Number of DTCs	The number of trouble codes recorded in the ECM.	0	—
O2 Sensor #11	Installation status of the front oxygen (A/F) sensor.	Support	—
O2 Sensor #12	Installation status of the rear oxygen sensor.	Support	—
Short term fuel trim #12	Air fuel ratio correction control value of the rear oxygen sensor.	0.0%	%
A/F Sensor #11	Air fuel ratio calculated from the front oxygen (A/F) sensor output value. (Lambda)	1.001	—
A/F Sensor #11	Output voltage of the front oxygen (A/F) sensor.	2.193 V	V
A/F Sensor #11	Air fuel ratio calculated from the front oxygen (A/F) sensor output value. (Lambda)	1.001	—
A/F Sensor #11	Front oxygen (A/F) sensor current value.	0.00	mA
Absolute Throttle Position B	Shows the sub throttle sensor voltage value in % against the full-range 5 V throttle sensor output voltage.	30.6%	%
Accelerator Pedal Position D	Shows the main accelerator sensor voltage value in % against the full-range 5 V throttle sensor output voltage.	13.3%	%
Accelerator Pedal	Shows the sub accelerator sensor voltage	13.3%	%

Position E	value in % against the full-range 5 V throttle sensor output voltage.		
Relative Accelerator Pedal Position	Accelerator opening angle with a full close point learning value taken into consideration.	0%	%
Misfire monitoring supported	Support status of the misfire diagnosis.	YES	—
Misfire monitoring ready	Status of the misfire diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	YES	—
Fuel system monitoring(Supp)	Support status of the fuel system diagnosis.	YES	—
Fuel system monitoring(Rdy)	Status of the fuel system diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	YES	—
Comprehensive component monitoring supported	Support status of the component diagnosis.	YES	—
Comprehensive component monitoring ready	Status of the component diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	YES	—
Catalyst monitoring supported	Support status of the catalyst diagnosis.	YES	—
Catalyst monitoring ready	Status of the catalyst diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
Heated catalyst monitoring supported	Support status of the heated catalyst diagnosis.	NO	—
Heated catalyst monitoring ready	Status of the heated catalyst diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
Evaporative purge system(Supp)	Support status of the evaporative purge system diagnosis.	NO	—
Evaporative purge system(Rdy)	Status of the evaporative purge system diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
Secondary air system(Supp)	Support status of the secondary air system diagnosis.	NO	—
Secondary air system(Rdy)	Status of the secondary air system diagnosis.	N/A	—

	YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.		
A/C system refrigerant(Supp)	Support status of the A/C system refrigerant diagnosis.	NO	—
A/C system refrigerant(Rdy)	Status of the A/C system refrigerant diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
Oxygen sensor monitoring supported	Shows the support status of oxygen sensor diagnosis.	YES	—
Oxygen sensor(Rdy)	Status of the oxygen sensor diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
O2 Heater Diagnosis(Supp)	Shows the support status of oxygen sensor heater diagnosis.	YES	—
O2 Heater Diagnosis(Rdy)	Status of the oxygen sensor heater diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	YES	—
EGR system(Supp)	Support status of the EGR diagnosis.	YES	—
EGR system(Rdy)	Status of the EGR diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
Misfire monitoring enabled	Shows whether or not the execution condition of misfire diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
Misfire monitoring completed	Shows whether or not the continuous misfire diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
Fuel system monitoring(Enable)	Shows whether or not the execution condition of fuel system diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
Fuel system monitoring(Comp)	Shows whether or not the fuel system diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
Comprehensive	Shows whether or not the execution condition	YES	—

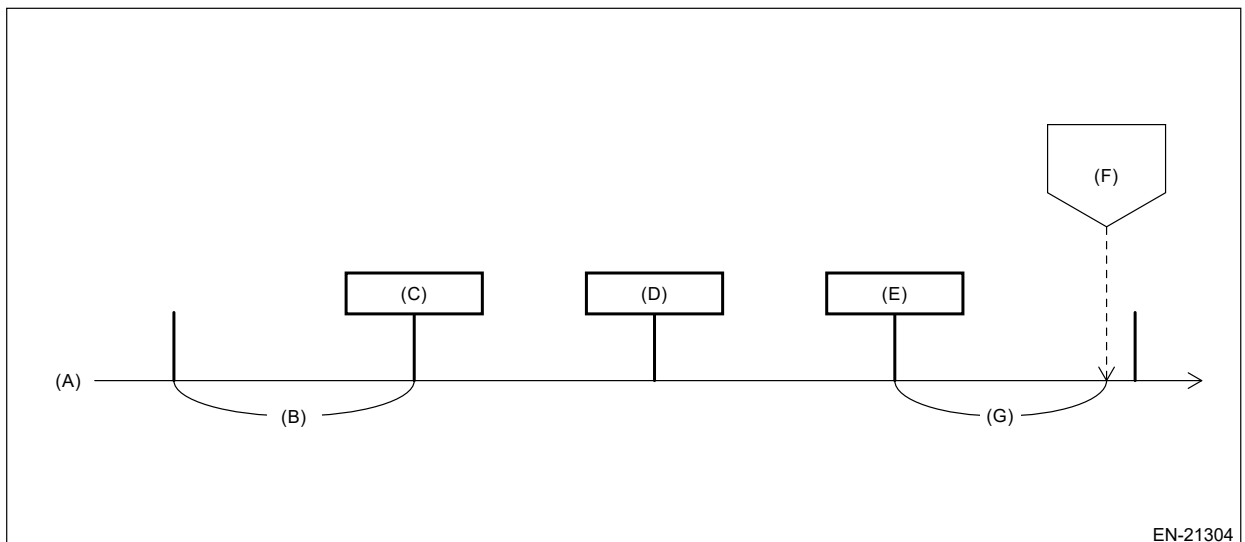
component monitoring enabled	of component diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.		
Comprehensive component monitoring completed	Shows whether or not the component diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
Catalyst monitoring	Shows whether or not the execution condition of catalyst diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
Catalyst monitoring completed	Shows whether or not the catalyst diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
Heated catalyst monitoring	Shows whether or not the execution condition of heated catalyst diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	N/A	—
Heated catalyst monitoring completed	Shows whether or not the heated catalyst diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
Evaporative purge system(Enable)	Shows whether or not the execution condition of evaporative purge system diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	N/A	—
Evaporative purge system(Comp)	Shows whether or not the evaporative purge system diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
Secondary air system(Enable)	Shows whether or not the execution condition of the secondary air system diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	N/A	—
Secondary air system(Comp)	Shows whether or not the secondary air system diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—

A/C system refrigerant(Enable)	Shows whether or not the execution condition of A/C system refrigerant diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	N/A	—
A/C system refrigerant(Comp)	Shows whether or not the A/C system refrigerant diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
Oxygen sensor monitoring	Shows whether or not the execution condition of oxygen sensor diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
Oxygen sensor monitoring completed	Shows whether or not the oxygen sensor diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
O2 Heater Diagnosis(Enable)	Shows whether or not the execution condition of oxygen heater diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
O2 Heater Diagnosis(Comp)	Shows whether or not the oxygen heater diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
EGR system(Enable)	Shows whether or not the execution condition of EGR diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
EGR system(Comp)	Shows whether or not the EGR diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
Generic OBDII	Shows the OBD regulation to be followed. This is the information recorded in the ECM, and it does not mean that the unit automatically judges the compliance to the OBD regulations.	OBD/OBD2	—

3. FREEZE FRAME DATA

Note:

- ECM updates the freeze frame data every 0.5 seconds, and always keeps the last three records. Time-series freeze frame data includes the last three freeze frame data and the freeze frame data when the DTC is detected.
- In the time-series freeze frame data, freeze frame data at detection, one block before, two blocks before, and three blocks before are displayed.
- Time lag between the freeze frame at detection and the freeze frame data of one block before changes within the range of 0 – 0.5 seconds. This is because the freeze frame data at detection is recorded when the DTC is actually detected, while the freeze frame data of one block before is updated every 0.5 seconds.



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- (A) 0.5 seconds timer (D) «Two blocks before» (F) «Detect»
 (B) 0.5 seconds (E) «One block before» (G) Changes within the range of 0 – 0.5 seconds, depending on the timing of DTC detection.
 (C) «three blocks before»

- When more than one DTCs are recorded, the time-series freeze frame data is recorded only for the first-detected DTC, and for the next DTC, just the freeze frame data of Detect is recorded. And for the subsequent DTCs, no freeze frame data is recorded.
 - When performing diagnosis, you can utilize the time-series freeze frame data to guess the vehicle status when the DTC was detected.
 - For detailed operation procedures, refer to “PC application help for Subaru Select Monitor”.
 - A list of the support data is shown in the following table.
1. On [Start] display, select [Diagnosis].
 2. On [Vehicle selection] display, enter vehicle information and select [OK].
 3. On [Main Menu] display, select [Each System].
 4. On [Select System] display, select [Engine Control System] and select [Enter].
 5. On [Select Function] display, select [Data monitor].
 6. Select [FFD] of the DTC displayed in [DTC].

Item	Contents	Remarks
Engine Speed	Value calculated from crankshaft position sensor	rpm

	output value.	
Air Flow Rate from Mass Air Flow Sensor	Value calculated from air flow sensor output value.	g/s
Vehicle Speed Sensor	Value calculated from vehicle speed sensor output value.	km/h or MPH
Throttle Opening Angle	Throttle valve opening angle (in percentage) calculated from throttle position sensor output value.	%
Ignition Timing Advance for #1 Cylinder	Ignition timing control value for No. 1 cylinder. Calculated from rotation speed, manifold pressure, intake air temperature, water temperature, and data from knock sensor etc.	°
Coolant Temp.	Value calculated from engine coolant temperature sensor output value.	°C or °F
Short Term Fuel Trim (B1)	Air fuel ratio correction control value for the front oxygen (A/F) sensor.	%
Long Term Fuel Trim (B1)	Air fuel ratio learning control value for the front oxygen (A/F) sensor.	%
Mani. Absolute Pressure	Value calculated from manifold pressure sensor output.	kPa, mmHg, inHg or psig
Bank 1 - Sensor 2 present at that location	Voltage value of rear oxygen sensor.	V
VVT Adv. Ang. Amount R	AVCS advance angle amount for the RH bank on the intake side.	deg
VVT Advance Target Angle Amount R	AVCS target advance angle amount for the RH bank on the intake side. This value is compared with the AVCS advance angle amount R to judge if the intake AVCS is operating properly. Response delays during the transition time.	deg
VVT Adv. Ang. Amount L	AVCS advance angle amount for the LH bank on the intake side.	deg
VVT Advance Target Angle Amount L	AVCS target advance angle amount for the LH bank on the intake side. This value is compared with the AVCS advance angle amount L to judge if the intake AVCS is operating properly. Response delays during the transition time.	deg
Control module voltage	ECM input power supply voltage.	V
Target Equivalence Ratio	Target air fuel ratio. (Lambda). It usually becomes 1.0 aiming at a theoretical air fuel ratio.	—
Intake Air Temp.	Value calculated from the intake air temperature sensor output value.	°C or °F
Ambient air temperature	Value that ECM estimates by using input values from the engine coolant temperature sensor or the intake air temperature sensor etc.	°C or °F
Ambient Temperature Sensor Signal	Data value of the ambient temperature input from the combination meter via CAN.	°C or °F

	Ambient temperature used for diagnosis.	
Calculated LOAD Value	Current rate of air amount. Value assuming that the air amount at the current engine speed with the throttle fully open is 100%.	%
Absolute Load Value	Percentage of current intake air amount against the maximum air intake amount of the engine. For non-turbo engine, the value can be close to 95%, but will never be 100%. For turbo engine, this value may exceed 100% due to a boost pressure.	%
Barometric Pressure	Atmospheric pressure calculated from atmospheric pressure sensor output value.	kPa, mmHg, inHg or psig
Actual Throttle Opening Angle	Actual throttle opening angle. Calculated by ECM based on the throttle sensor input value.	deg
Commanded Throttle Actuator Control	Control value of the target throttle opening angle calculated by ECM. Target value of opening angle in percentage when 0% means fully closed and 100% means fully open.	%
Relative Throttle Position	Current throttle opening angle in percentage against the throttle voltage (full range) that has reflected the full close point learning value. The value will be approx. 70% at full open.	%
Idle Mass Air Flow	Air volume correction value to maintain the target rotation speed in each water temperature. Corrects air volume when the water temperature changes. It includes values of the feedback correction amount and the learning value.	g/s
Idle Mass Air Flow Feedback correct	Air volume compensation value of ISC as a feedback correction to stabilize the idling speed.	g/s
ISC Learning Value	Learning control value of ISC. After warming up, learning control is executed to reduce the ISC feedback correction to zero, in order to stabilize the engine speed.	g/s
Idle A/C load correct	Air volume correction when the air conditioner is turned on. ECM corrects the air volume against the target rotation speed when the air conditioner is turned ON.	g/s
Electric Load Feedback Val	Air volume correction value when an electric load is turned on. ECM corrects the air volume against the set target rotation speed when the electric load is turned ON.	g/s
Idle dirty throttle correct	Calculates the ISC learning values on a long-term basis, and judges as an ISC dirty throttle correction when the learning value increases gradually. When carbon or other dirt accumulates on the ISC throttle and make the throttle dirty, air volume	g/s

	decreases when the throttle is fully closed. The ECM increases the amount of compensation air to keep the rotation speed.	
Fuel Level Input	Fuel level sensor output value. Input value to ECM. Total value of main and sub.	%
Fuel level resistance	Fuel level sensor resistance value. Input value to ECM.	Ω
Commanded Evaporative Purge	Evaporative purge rate displayed by the OBD.	%
Purge Density Learn Value	Leaning value of the evaporation gas density purged from the canister. ECM displays the estimated leaning value.	%
Evap Purge Flow	Purge ratio when the evaporation gas is purged from the canister. ECM performs a duty drive to the purge solenoid valve. The amount of gas actually purged will vary depending on the vacuum pressure difference before/after the solenoid valve. Purge ratio displayed here shows current purge amount in percentage against the maximum purge amount when the maximum vacuum pressure is applied.	%
Alternator control mode	Control mode of the electric power generation voltage by the alternator. Low: Mode that controls the battery charge Mid: Mode where the battery is not charged and discharged High: Mode that fixes the voltage when the battery is charged or when an electric load is turned on ExHigh: Mode where the battery is charged during deceleration Smart: Mode that maintains target SOC and restrains unnecessary power generation Low (Start): Mode that gradually increases the voltage at start Low (Acceleration): Mode that suppresses power generation load when slightly stronger acceleration was judged	—
Battery Terminal Voltage	Voltage value between battery terminals input from the battery sensor.	—
Battery Charge/Discharge Current	Battery charge/discharge current value input from the battery sensor. When the value is positive: The current flows to a direction that the battery is charged. When the value is negative: The current flows to a direction that the battery is discharged.	—
Estimated Battery	Battery temperature input from the battery sensor.	—

Temperature		
Remaining battery capacity	Remaining amount of battery estimated by ECM.	—
Fuel system for Bank 1	Feedback status of air fuel ratio. Open: Feedback is stopped Closed: Feedback control is being performed	—
Fuel system for Bank 2	Feedback status of air fuel ratio. Open: Feedback is stopped Closed: Feedback control is being performed	—
A/F Sensor #1 Resistance	Value calculated from the front oxygen (A/F) sensor output value.	ohm
Commanded EGR	Target value as EGR setting value calculated by ECM.	%
EGR Error	Percentage of the difference between target EGR steps and actual EGR steps. Both a positive value and a negative value mean that it doesn't fulfill the target. When the value is positive: It opens more than the target value. When the value is negative: It opens smaller than the target value.	%
Cylinder Monitor #1	Calculates the rotation speed between certain angles on the #1 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	rpm
Cylinder Monitor #2	Calculates the rotation speed between certain angles on the #2 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	rpm
Cylinder Monitor #3	Calculates the rotation speed between certain angles on the #3 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	rpm
Cylinder Monitor #4	Calculates the rotation speed between certain angles on the #4 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	rpm
Trip Count	Time stamp information. Number of times the ignition is ON since the vehicle was manufactured. The number of ignition ON is also recorded when a trouble code is recorded, so the comparison with that number will show you how many times the ignition has turned on since the diagnostic code was recorded.	Time
Count	Time stamp information.	—

	Each unit individually counts the elapsed time since the ignition is turned to ON. Master integrated unit and ECM synchronize with the master time. When synchronized: "Common" When not synchronized: "Originally"	
Time Count	Time stamp information. Elapsed time after ignition ON. When a trouble code is recorded, the elapsed time after ignition ON is also recorded.	ms
Time Since Engine Start	Elapsed time after starting the engine.	sec
Timer after start	Elapsed time after starting the engine. This value is used for control.	sec
Accumulation Time After Engine Run	Cumulative time after starting the engine. For models with Auto Start Stop, cumulative time after the first engine start. Time is not accumulated while the engine stops due to the Auto Start Stop system.	sec
Initial Engine Oil Temp	Oil temperature when starting the engine, which is input to ECM from the oil temperature sensor.	Celsius
Initial Engine Coolant Temp.	Water temperature when starting the engine, which is input to ECM from the water temperature sensor.	Celsius
Initial Intake Air Temp.	Intake air temperature when starting the engine, which is input to ECM from the intake air temperature sensor.	Celsius
Engine Starting Time	Time needed since the cranking started till the judgment of engine start is complete.	ms
Start Mask Control Check 1	Information that shows whether the start prohibition control is executed on the engine side when starting. Values other than zero means that the control is executed and the engine start is prohibited.	ms
IG OFF Elapsed Time	Time the vehicle has been left since the engine stopped. Shows the elapsed time after turning OFF the ignition switch.	sec
Fuel Cut Elapsed Time	Elapsed time after experienced high rotation speed.	sec
Type of fuel currently being utilized by the vehicle	Fuel information recorded in the ECM. Not the fuel information currently used.	—
Auto Trans Neutral Drive Status	Neutral condition. Information input from the inhibitor switch. (CVT model)	—
Manual Trans Neutral Gear Status	Neutral condition. Information input from the neutral switch. (MT model)	—
X mode	X mode ON or OFF status.	—
Stop Light Switch	Stop light switch signal. Set to "ON" when the stop light illuminates.	sec

	Input value to ECM.	
Ignition Switch	Ignition switch signal. Set to "ON" when the ignition switch is ON.	sec
A/C Mid Pressure Switch	Air conditioner middle pressure switch signal. Set to "ON" when the switch is ON. Input value to ECM.	sec
A/C Compressor Signal	A/C compressor drive signal. Set to "ON" when the drive signal is output. ECM output value.	sec
Starter Switch	Starter switch signal. Set to "ON" when the starter is ON. Input value to ECM.	sec
AT turbine speed	Turbine rotation speed of the transmission. Turbine rotation speed is input from the transmission CM via CAN. (CVT model)	—
Lock up status	Lock-up status of the transmission. Lock up status is input from the transmission CM via CAN. (CVT model)	—
P/N Signal	P/N status of the transmission. P/N range status is input from the transmission CM via CAN. (CVT model)	—
Imbalance Check 1 #1	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—
Imbalance Check 1 #2	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—
Imbalance Check 1 #3	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—
Imbalance Check 1 #4	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—
Alternator Mechanical Error Status	Status where alternator is judged as having mechanical trouble.	—
Alternator Electrical Output Error Status	Status where alternator is judged as having electric abnormality.	—
Alternator High Temperature Error Status	Status where alternator is judged as having high temperature malfunction.	—
Alternator Communication Error Status	Status where alternator is judged as having communication failure.	—
Regulator Temperature	Alternator regulator temperature.	—
Imbalance Check 2 #1	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—
Imbalance Check 2 #2	Detailed information of diagnosis for dispersion	—

	between cylinders. (Compliance with OBD regulations)	
Imbalance Check 2 #3	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—
Imbalance Check 2 #4	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—
Imbalance Check 3 R	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—
Imbalance Check 4 R	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—
O2 Sensor #11	Installation status of the front oxygen (A/F) sensor.	—
O2 Sensor #12	Installation status of the rear oxygen sensor.	—
Short term fuel trim #12	Air fuel ratio correction control value of the rear oxygen sensor.	%
Absolute Throttle Position B	Shows the sub throttle sensor voltage value in % against the full-range 5 V throttle sensor output voltage.	%
Accelerator Pedal Position D	Shows the main accelerator sensor voltage value in % against the full-range 5 V.	%
Accelerator Pedal Position E	Shows the sub accelerator sensor voltage value in % against the full-range 5 V.	%
Generic OBDII	Shows the OBD regulation to be followed. This is the information recorded in the ECM, and it does not mean that the unit automatically judges the compliance to the OBD regulations.	—

4. V.I.N REGISTRATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Engine Control System] and select [Enter].
5. On [Select Function] display, select [Work Support].
6. On [Work Support] display, select [Entry VIN].
7. Perform the procedures shown on the display screen.

ENGINE (DIAGNOSTICS)(H4DOTC) > Active Test

OPERATION

Caution:


After executing the system operation check mode, clear the memory.  **Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode>OPERATION.](#)**

Note:

For detailed operation procedures, refer to “PC application help for Subaru Select Monitor”.

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Engine Control System] and select [Enter].
5. On [Select Function] display, select [Active Test].


Active test items	Contents	Execution condition
Fuel Pump Control (ON/OFF Dr.)	ON/OFF of the fuel pump can be set.	Ignition switch ON (engine OFF)
CPC Solenoid Valve	ON/OFF of the purge control solenoid valve can be set.	
Radiator Fan Relay	ON/OFF of the radiator fan relay can be set.	
A/C Compressor Relay	ON/OFF of the A/C relay can be set.	
Turbocharger Wastegate Solenoid	Wastegate control solenoid valve can be set between 0.0% — 99.6%.	
CPC Solenoid 2	ON/OFF of the purge control solenoid valve 2 can be set.	
ELCM switching valve	The leak check valve assembly switching valve can be set to ON/OFF.	
ELCM pump	The leak check valve assembly vacuum pump can be set to ON/OFF.	Idling
Fuel Pump Control (OFF Drive)	Fuel pump can be set to OFF.	
Fixed Idle Ignition Timing	Idle ignition timing can be set and fixed to 10.0°.	Idling
Idle Speed Control	Idle speed can be set to 500 — 2000 rpm.	Idling

Injection Stop Mode (Injector 1) Injection Stop Mode (Injector 2) Injection Stop Mode (Injector 3) Injection Stop Mode (Injector 4)	Injector of each cylinder can be set to stop the fuel injection.	Idling
Injection Quantity Control	The amount of fuel injection can be set to 0 — 20%.	Idling
EGR Valve Control (Step)	EGR control valve can be set to 0 — 255 STEP.	Idling
High Pressure Fuel Inspection	High pressure fuel pipe inspection can be executed.	Idling
Alternator control	Alternator control mode can be set to one of the followings: Low mode Middle mode High mode ExHigh mode	Idling
Compression monitor	Compression can be measured.  Ref. to MECHANICAL(H4DOTC)>Compression.	Ignition switch ON (engine OFF) Accelerator pedal is fully depressed

PROCEDURE

1. ENGINE

1. CHECK ENGINE START FAILURE.


1. Ask the customer when and how the trouble occurred using the interview check list.
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Check List for Interview>CHECK.](#)
2. Start the engine.

Does the engine start?

Yes

 [Go to 2.](#)

No

Inspection using "Diagnostics for Engine Starting Failure"
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostics for Engine Starting Failure.](#)


2. CHECK ILLUMINATION OF MALFUNCTION INDICATOR LIGHT.

Does the malfunction indicator light illuminate?

Yes

 [Go to 3.](#)


No

Inspection using "General Diagnostic Table".
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>General Diagnostic Table.](#)

3. CHECK COMMUNICATION STATUS.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor or general scan tool to the data link connector.
3. Turn the ignition switch to ON, and run the Subaru Select Monitor or general scan tool.

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Subaru Select Monitor".
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**


For detailed operation procedures, refer to the general scan tool operation manual.

Does Subaru Select Monitor communicate with vehicle normally?

Yes

 [Go to 4.](#)


No

Inspection using "Basic Diagnostic Procedure" of LAN system  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

4. CHECK DTC.



Read DTC using Subaru Select Monitor or general scan tool.

Note:


- **Subaru Select Monitor**
Refer to "Read Diagnostic Trouble Code (DTC)" for detailed operation procedure.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is DTC displayed on Subaru Select Monitor or general scan tool?

Yes

Record DTC, time stamp, and freeze frame data, then repair the trouble cause.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#) After repair, go to the next step.  [Go to 5.](#)


Note:

- **For the time stamp, refer to LAN section.**  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>General Description>CAUTION > TIME STAMP.](#)
- **Depending on DTCs, time stamp may not be stored.**




No

Repair the related parts.

Note:


If DTC is not shown on display although the malfunction indicator light illuminates, perform the diagnosis of malfunction indicator light circuit or combination meter.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Malfunction Indicator Light.](#)

5. PERFORM DIAGNOSIS.

1. Clear the memory.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)
2. Perform the Inspection Mode or Drive Cycle.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode.](#)  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Drive Cycle.](#)

Is DTC displayed on Subaru Select Monitor or general scan tool?

Yes

Inspect using "Diagnostic Procedure with Diagnostic Trouble Code (DTC)".
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\).](#)

No

Finish the diagnosis.

ENGINE (DIAGNOSTICS)(H4DOTC) > Check List for Interview

CHECK

1. CHECK LIST NO. 1

Check the following item when problem has occurred.

Note:

Use copies of this page for interviewing customers.



Customer's name		Engine No.	
Date of purchase		Fuel type	
Date of repair		Odometer reading	km
V.I.N.			miles
Weather	<input type="checkbox"/> Fine <input type="checkbox"/> Cloudy <input type="checkbox"/> Rainy <input type="checkbox"/> Snowy <input type="checkbox"/> Various/Others:		
Ambient air temperature	°C (°F)		
	<input type="checkbox"/> Hot <input type="checkbox"/> Warm <input type="checkbox"/> Cool <input type="checkbox"/> Cold		
Place	<input type="checkbox"/> Highway <input type="checkbox"/> Suburbs <input type="checkbox"/> Inner city <input type="checkbox"/> Uphill <input type="checkbox"/> Downhill <input type="checkbox"/> Rough road <input type="checkbox"/> Others:		
Engine temperature	<input type="checkbox"/> Cold <input type="checkbox"/> Warming-up <input type="checkbox"/> After warming-up <input type="checkbox"/> Any temperature <input type="checkbox"/> Others:		
Engine speed	rpm		
Vehicle speed	km/h (MPH)		
Driving conditions	<input type="checkbox"/> Not affected <input type="checkbox"/> At starting <input type="checkbox"/> While idling <input type="checkbox"/> At racing <input type="checkbox"/> While accelerating <input type="checkbox"/> While cruising <input type="checkbox"/> While decelerating		

	<input type="checkbox"/> While turning (RH/LH)		
Headlight	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	Rear defogger	<input type="checkbox"/> ON / <input type="checkbox"/> OFF
Blower	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	[Audio]	<input type="checkbox"/> ON / <input type="checkbox"/> OFF
A/C compressor	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	Rear entertainment system	<input type="checkbox"/> ON / <input type="checkbox"/> OFF
Radiator fan	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	Car phone	<input type="checkbox"/> ON / <input type="checkbox"/> OFF
Front wiper	<input type="checkbox"/> ON / <input type="checkbox"/> OFF	Wireless device	<input type="checkbox"/> ON / <input type="checkbox"/> OFF
Rear wiper	<input type="checkbox"/> ON / <input type="checkbox"/> OFF		

2. CHECK LIST NO. 2

Check the following item about the vehicle's state when the malfunction indicator light turns on.

Note:

Use copies of this page for interviewing customers.



a) Other warning lights or indicators illuminate. <input type="checkbox"/> Yes / <input type="checkbox"/> No
<input type="checkbox"/> Fuel level warning light <input type="checkbox"/> Charge warning light <input type="checkbox"/> Engine coolant temperature warning light <input type="checkbox"/> Oil pressure warning light <input type="checkbox"/> ATF temperature warning light or Sport indicator light <input type="checkbox"/> Driver's control center differential indicator light <input type="checkbox"/> ABS warning light <input type="checkbox"/> VDC warning light <input type="checkbox"/> Cruise indicator light <input type="checkbox"/> SI-CRUISE warning light <input type="checkbox"/> Immobilizer indicator light <input type="checkbox"/> STEERING warning light <input type="checkbox"/> Electronic parking brake warning light <input type="checkbox"/> Glow indicator <input type="checkbox"/> Sedimenter warning light <input type="checkbox"/> Others:
b) Fuel level
<ul style="list-style-type: none"> • Lack of fuel: <input type="checkbox"/> Yes / <input type="checkbox"/> No • Indicator position of fuel gauge: • Experienced running out of fuel: <input type="checkbox"/> Yes / <input type="checkbox"/> No
c) Intentional connecting or disconnecting of harness connectors or spark plug cords: <input type="checkbox"/> Yes / <input type="checkbox"/> No
<ul style="list-style-type: none"> • What:
d) Intentional connecting or disconnecting of hoses: <input type="checkbox"/> Yes / <input type="checkbox"/> No
<ul style="list-style-type: none"> • What:
e) Installing of parts other than genuine parts: <input type="checkbox"/> Yes / <input type="checkbox"/> No
<ul style="list-style-type: none"> • What: • Where:
f) Occurrence of noise: <input type="checkbox"/> Yes / <input type="checkbox"/> No

- From where:
- What kind:

g) Occurrence of smell: Yes / No

- From where:
- What kind:

h) Intrusion of water into engine compartment or passenger compartment: Yes / No

i) Troubles occurred

- Engine does not start.
- Engine stalls during idling.
- Engine stalls while driving.
- Engine speed decreases.
- Engine speed does not decrease.
- Rough idling
- Poor acceleration
- Back fire
- After fire
- Does not shift.
- Excessive shift shock

ENGINE (DIAGNOSTICS)(H4DOTC) > Clear Memory Mode

OPERATION

1. SUBARU SELECT MONITOR

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Engine Control System] and select [Enter].
5. On [Select Function] display, select [DTC].
6. On [DTC] display, select [Clear memory].

Note:

- **Initial diagnosis of electronic throttle control is performed after memory clearance. Wait for 10 seconds or more after turning the ignition switch to ON, and then start the engine.**
- **For detailed operation procedures, refer to "PC application help for Subaru Select Monitor".**

2. GENERAL SCAN TOOL

For procedures clearing memory using the general scan tool, refer to the general scan tool operation manual.

Note:

Initial diagnosis of electronic throttle control is performed after memory clearance. Wait for 10 seconds or more after turning the ignition switch to ON, and then start the engine.

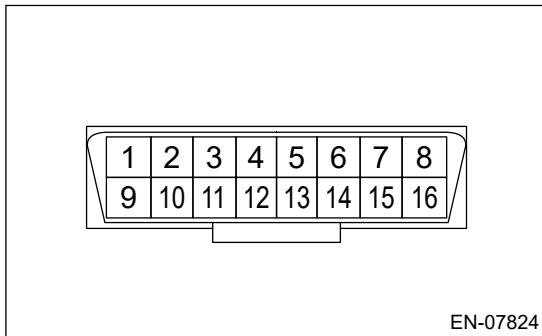
ENGINE (DIAGNOSTICS)(H4DOTC) > Data Link Connector

NOTE

This connector is used for Subaru Select Monitor.

Caution:

Do not connect any scan tools other than Subaru Select Monitor or general scan tool because the circuit for Subaru Select Monitor may be damaged.



Terminal No.	Contents	Terminal No.	Contents
1	Not used	9	Not used
2	Not used	10	Not used
3	Not used	11	Not used
4	Ground	12	Not used
5	Ground	13	Not used
6	CAN communication (Hi)	14	CAN communication (Lo)
7	Not used	15	Not used
8	IG2	16	Power supply

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P000A "A" CAMSHAFT POSITION SLOW RESPONSE BANK 1

Note:

For the diagnostic procedure, refer to DTC P0011.  Ref. to [ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0011 "A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1.](#)

1. OUTLINE OF DIAGNOSIS

- Intake side
Detect the AVCS system malfunction.
Judge NG when the amount of AVCS actual timing advance does not approach to the amount of AVCS target timing advance.
- Exhaust side
Detect the exhaust AVCS system malfunction.
Judge NG when the amount of exhaust AVCS actual timing advance approaches the amount of exhaust AVCS target timing advance.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition	DTC
Intake side		
Battery voltage AVCS control Target timing advance change amount (per 80 ms)	≥ 10.9 V In operation < 4°CA	P000A P000C
Exhaust side		
Battery voltage Exhaust AVCS control Target timing advance change amount (per 80 ms)	≥ 10.9 V In operation < 4°CA	P000B P000D

3. GENERAL DRIVING CYCLE

- Intake side
Perform the diagnosis continuously while AVCS is operating.
- Exhaust side
Perform the diagnosis continuously while exhaust AVCS is operating.

4. DIAGNOSTIC METHOD

- Intake side
When the differences of target timing advance amount and actual timing advance amount is calculated during AVCS control, and the difference per predetermined time is the specified

value or larger.

Judge as NG when the following conditions are established within the predetermined time.

- Exhaust side

When the differences of target timing advance amount and actual timing advance amount is calculated during exhaust AVCS control, and the difference per predetermined time is the specified value or larger.

Judge as NG when the following conditions are established within the predetermined time.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Intake side		
$\Sigma(\text{Target position} - \text{Actual position})$	> 4000°CA or < -4000°CA	P000A P000C
Exhaust side		
$\Sigma(\text{Target position} - \text{Actual position})$	> 4500°CA or < -4500°CA	P000B P000D

Integration time: 25s


Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P000B "B" CAMSHAFT POSITION SLOW RESPONSE BANK 1

Note:

For the diagnostic procedure, refer to DTC P0014.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0014 "B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1.](#)

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to the exhaust side of DTC P000A.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P000A "A" CAMSHAFT POSITION SLOW RESPONSE BANK 1.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P000C "A" CAMSHAFT POSITION SLOW RESPONSE BANK 2

Note:

For the diagnostic procedure, refer to DTC P0021.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0021 "A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2.](#)

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to the intake side of DTC P000A.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P000A "A" CAMSHAFT POSITION SLOW RESPONSE BANK 1.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P000D "B" CAMSHAFT POSITION SLOW RESPONSE BANK 2

Note:

For the diagnostic procedure, refer to DTC P0024.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0024 "B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to the exhaust side of DTC P000A.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P000A "A" CAMSHAFT POSITION SLOW RESPONSE BANK 1.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0010 "A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

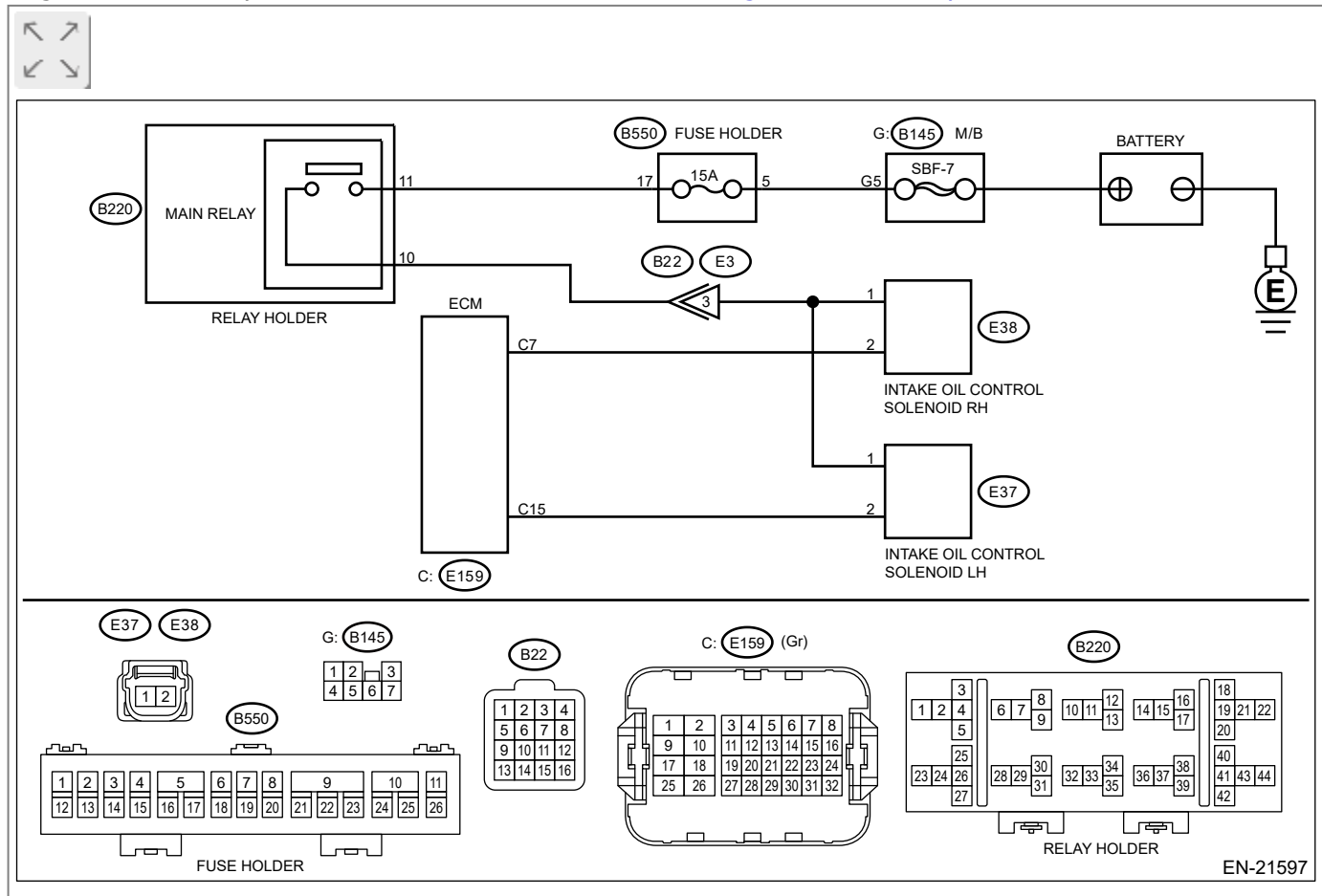
Improper idling

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK OUTPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and engine ground.


Connector & terminal




(E159) No. 7 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

 [Go to 3.](#)

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes

Repair the poor contact of ECM connector.

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

3. CHECK POWER SUPPLY TO THE INTAKE OIL CONTROL SOLENOID RH.

Measure the voltage between intake oil control solenoid RH connector and engine ground.

Connector & terminal

(E38) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

Repair the power supply circuit.

4. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake oil control solenoid RH.


3. Disconnect the connector from ECM.
4. Measure the resistance between intake oil control solenoid RH connector and engine ground.

Connector & terminal

(E38) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM and intake oil control solenoid RH connector.

5. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH CONNECTOR.

Measure the resistance of harness between ECM and intake oil control solenoid RH.

Connector & terminal

(E159) No. 7 — (E38) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 6.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and intake oil control solenoid RH connector**
- **Poor contact of coupling connector**

6. CHECK INTAKE OIL CONTROL SOLENOID RH.

Measure the resistance between intake oil control solenoid RH terminals.

Terminals


No. 1 — No. 2:

Is the resistance 6 — 12 Ω ?

Yes

Repair the poor contact of intake oil control solenoid RH connector.

No

Replace the intake oil control solenoid RH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open/short circuit of oil control solenoid valve.

Judge as NG when the current is small even though the duty signal is large, or when the current is large even though the duty signal is small.

2. EXECUTION CONDITION

Diagnosis 1

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Oil control solenoid control duty	$\geq 99.6\%$

Diagnosis 2

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Oil control solenoid control duty	$< 8\%$

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Diagnosis 1

Judgment value

Malfunction Criteria	Threshold Value
Oil control solenoid control present current	$< 0.306 \text{ A}$

Diagnosis 2

Judgment value

Malfunction Criteria	Threshold Value
Oil control solenoid control present current	$\geq 0.306 \text{ A}$

Time needed for diagnosis: 2000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0011 "A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

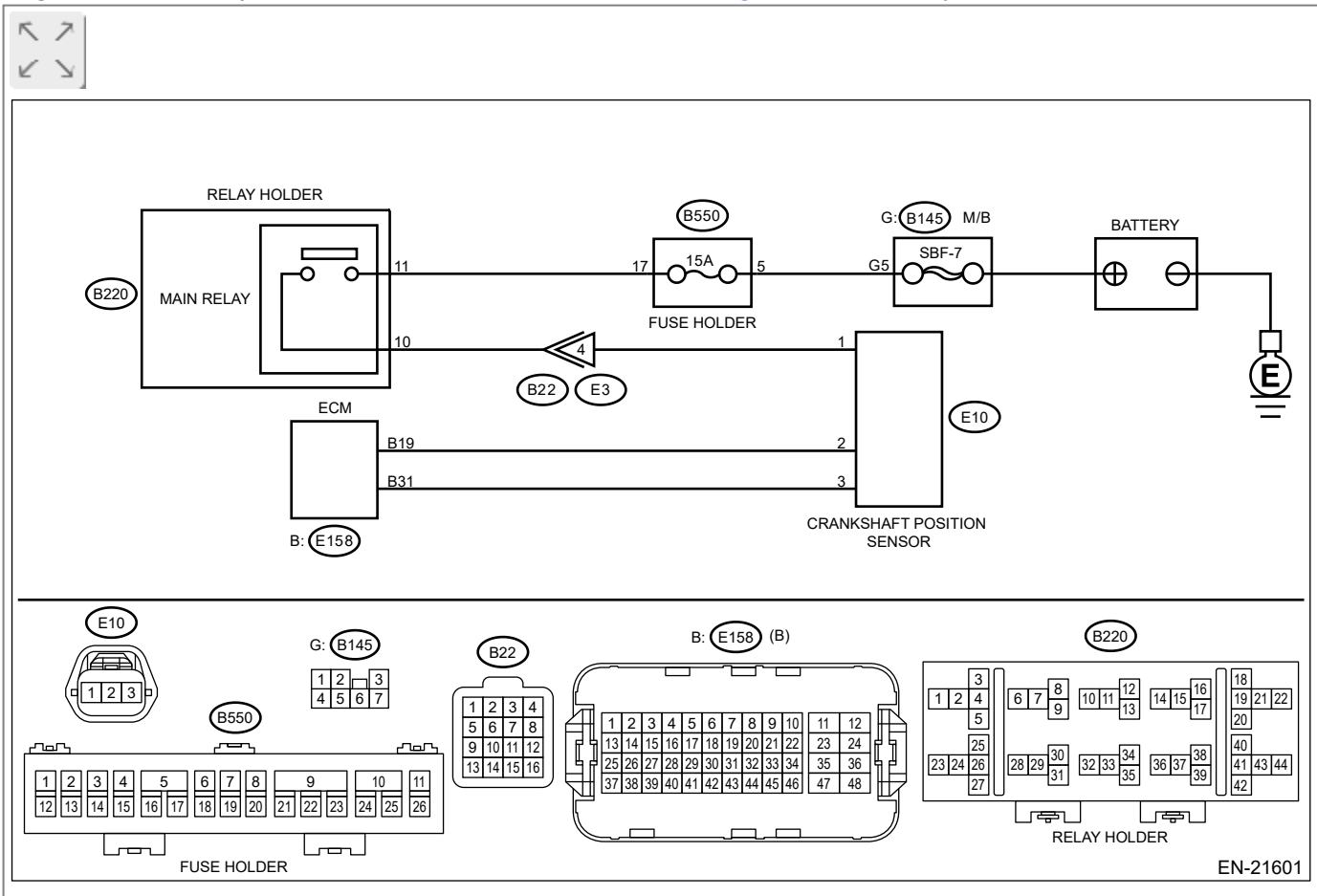
- Engine stalls.
- Improper idling

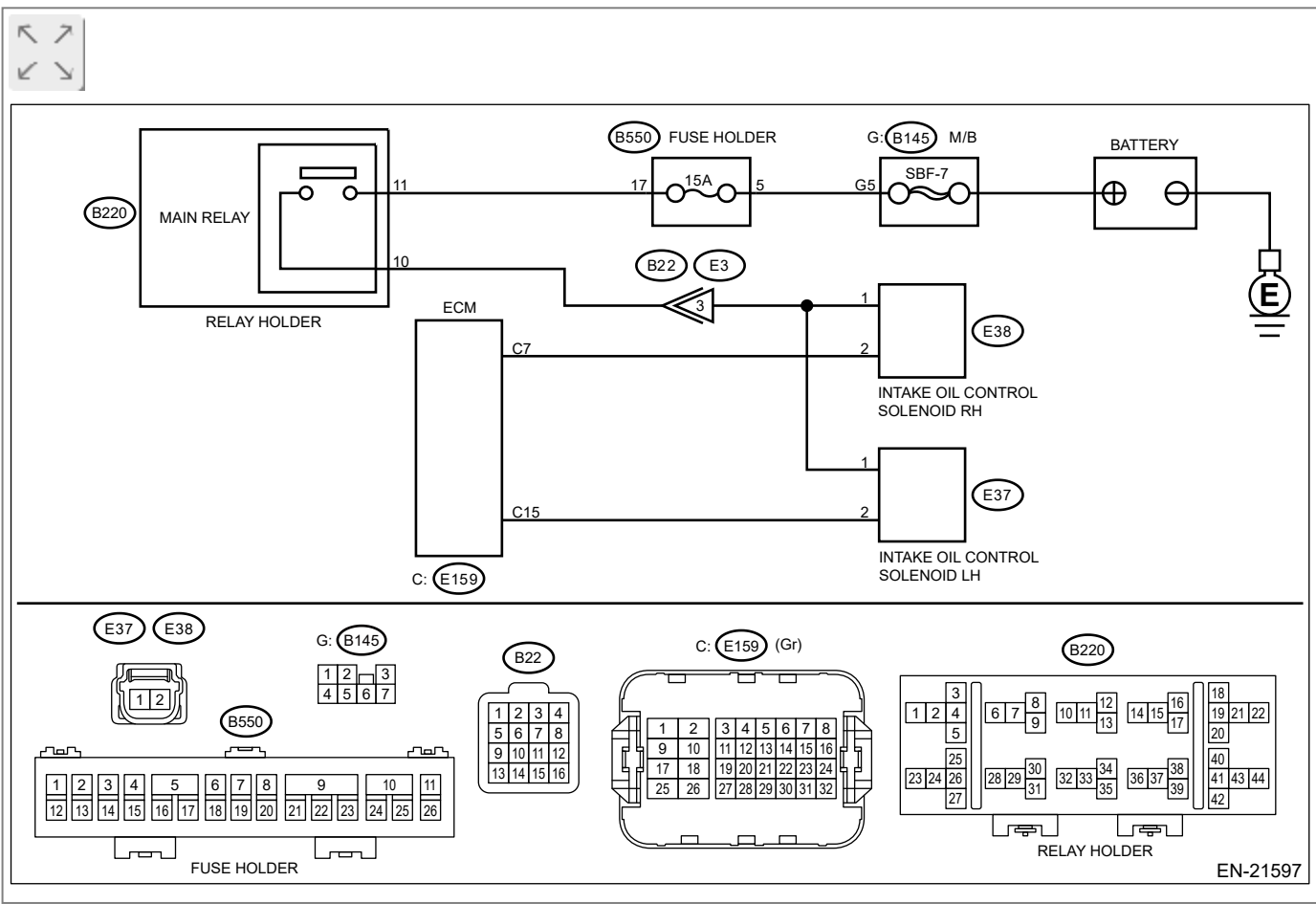
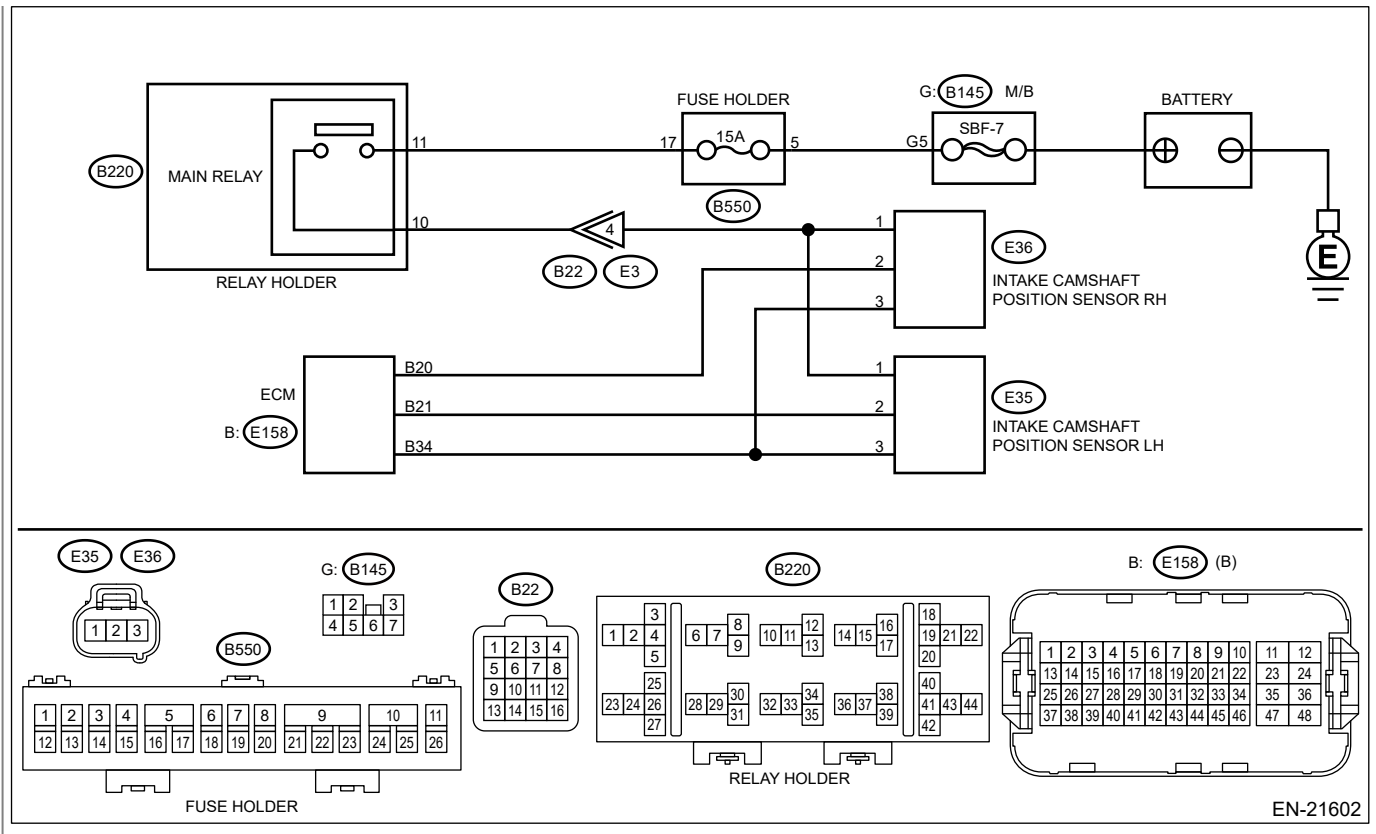
Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..


WIRING DIAGRAM:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.






1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)



DTC Check

Is DTC other than P000A and P0011 displayed? (Current malfunction)

Yes

Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)

No

Save the freeze frame data.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)
 [Go to 2.](#)

2. CHECK OUTPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and engine ground.

Connector & terminal

(E159) No. 7 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 3.](#)

No

 [Go to 4.](#)

3. CHECK FOR POOR CONTACT.

Check the ECM connector and harness.

Note:

Check the following items.

- Poor contact of ECM connector
- Temporary open or short circuit of harness
- Contamination, corrosion or looseness of engine ground terminal

Is the check result OK?

 [Go to 5.](#)

Yes

No

Repair or replace faulty parts.

4. CHECK POWER SUPPLY TO THE INTAKE OIL CONTROL SOLENOID RH.

Measure the voltage between intake oil control solenoid RH connector and engine ground.

Connector & terminal

(E38) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 5.](#)

No

Repair the power supply circuit.

5. CHECK ENGINE OIL CONDITION.

Check the engine oil condition.


Note:

Check the following items.




- **Within the specified range in amount**
- **Excessively dirty**
- **Coagulated by additives**
- **Use of oil of specified viscosity**

Is the check result OK?


Yes


 [Go to 6.](#)

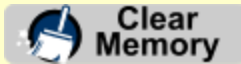
No



Adjust the oil amount, or replace the engine oil and engine oil filter.  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)
 [Go to 6.](#)

6. CHECK ON-BOARD MONITOR TEST RESULT.

1. Replace the intake oil control solenoid RH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)

2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)



3. Perform drive cycle T.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Drive Cycle.](#)
4. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE\$06.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>General Scan Tool.](#)

Caution:

- **When performing driving cycle, there should be 2 persons (driver and checker) and the checker should perform the data check.**
- **When performing the drive cycle on the public road, be very careful of the traffic condition and the safe driving must be the high priority.**

Note:

- **When the diagnostic value is 0, the diagnosis is incomplete. Therefore, do not stop the engine and perform the drive cycle again.**
- **Always keep on checking the data while reading out the diagnostic value because the diagnostic value is repeatedly updated.**

5. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 1] of the replaced oil control solenoid 1000 or more?

Yes

 [Go to 8.](#)

No

 [Go to 7.](#)

7. CHECK ON-BOARD MONITOR TEST RESULT.




Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 6.

Is the value of [VVT monitor bank 1] 1000 or less, and more than (value of [VVT monitor bank 2] $\times 1.5 + 100$) compared with the value of [VVT monitor bank 2]?

Yes

 [Go to 8.](#)

No





Idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)
 [Go to 17.](#)

8. CHECK HARNESS AND CONNECTOR.

Check for a bend, damage and poor contact of harness and connector.


Note:

Check the following items.





- **ECM**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)
- **Oil control solenoid**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Oil Control Solenoid>INSPECTION.](#)
- **Camshaft position sensor**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Camshaft Position Sensor>INSPECTION.](#)
- **Crankshaft position sensor**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor Plate>INSPECTION.](#)


Is the check result OK?

Yes

 [Go to 9.](#)

No

Repair or replace faulty parts.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\)>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Camshaft Position Sensor.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor Plate.](#)

 [Go to 9.](#)

9. CHECK HARNESS AND CONNECTOR (OPEN).


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the intake oil control solenoid RH.
4. Measure the resistance between intake oil control solenoid RH connector and ECM connector.

Connector & terminal

(E159) No. 7 — (E38) No. 2:


Is the resistance less than 1 Ω ?

Yes

 [Go to 10.](#)

No

Repair or replace faulty parts.

 [Go to 17.](#)

10. CHECK HARNESS AND CONNECTOR (OPEN).


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the intake camshaft position sensor RH.
4. Measure the resistance between the intake camshaft position sensor RH connector and ECM connector.

Connector & terminal

(E158) No. 20 — (E36) No. 2:


Is the resistance less than 1 Ω ?

Yes

 [Go to 11.](#)

No

Repair or replace faulty parts.

 [Go to 17.](#)

11. CHECK HARNESS AND CONNECTOR (OPEN).




1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the crankshaft position sensor.
4. Measure the resistance between the crankshaft position sensor connector and ECM connector.

Connector & terminal

(E158) No. 19 — (E10) No. 2:


Is the resistance less than 1 Ω ?

Yes

 [Go to 12.](#)


No

Repair or replace faulty parts.

 [Go to 17.](#)


12. CHECK ENGINE OIL PRESSURE.




Check the engine oil pressure.  [Ref. to MECHANICAL\(H4DOTC\)>Engine Oil Pressure>INSPECTION.](#)

Is the oil pressure of engine oil normal?

Yes

 [Go to 14.](#)

No

 [Go to 13.](#)

13. CHECK OIL STRAINER.



Check the oil strainer. [Ref. to LUBRICATION\(H4DO\)>Oil Pan>INSPECTION.](#)

Does any foreign matter exist at the oil strainer in the oil pan?

Yes

Check and clean inside the oil strainer.

[Go to 14.](#)

No

Replace the chain cover. [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover.](#)

Caution:

Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>ASSEMBLY.](#)

[Go to 15.](#)

14. CHECK OIL PATH OF CHAIN COVER.



1. Remove the engine from the vehicle. [Ref. to MECHANICAL\(H4DOTC\)>Engine Assembly>REMOVAL.](#)
2. Check the oil path of the chain cover. [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSPECTION.](#)

Note:

Check the O-rings in the following oil path and also check that no foreign matter exists.

- Inlet of oil pump
- Outlet of oil pump
- Each O-ring in the path leading to left/right cylinder head
- Oil control solenoid
- Foreign matter exists

Is the check result OK?

Yes

[Go to 15.](#)


No

Replace faulty parts. If there is any foreign matter, replace the chain cover.

[Ref. to MECHANICAL\(H4DOTC\)>Chain Cover.](#)

[Go to 15.](#)

15. CHECK THE CAMSHAFT CONDITION.

1. Remove the timing chain.  [Ref. to MECHANICAL\(H4DOTC\)>Timing Chain Assembly>REMOVAL.](#)
2. Rotate the camshaft by hand to compare the rotational resistance of the four.


Note:

Check the following items if there is a clearly faulty condition in the camshaft (bank 1) such as restriction or rotational resistance by comparing it with the rotational resistance of the camshaft (bank 2).



- Foreign matter attached to camshaft
- Damage of camshaft (scratching, galling, wear, etc.)
- Check for consequence from improper rotation of cam journal bearing


Is the check result OK?

Yes

 [Go to 16.](#)

No

Replace the cam carrier and camshaft.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier.](#)  [Ref. to MECHANICAL\(H4DOTC\)>Camshaft.](#)


 [Go to 16.](#)

16. CHECK OIL PASSAGE BETWEEN OIL PUMP AND OIL CONTROL SOLENOID.

Visually check the following parts of the oil passage from the oil pump to the oil control solenoid to check obvious defectiveness such as foreign matter, clogging, etc.

- Oil passage in cam Carrier
- Oil passage on cylinder head side
- Oil passage at the joint between cam sprocket and camshaft
- Oil passage at the back of sprocket and the end of camshaft when the sprocket is removed

Note:

Refer to removal procedure of cam carrier in service manual.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>REMOVAL.](#)


Is the check result OK?


Yes


Replace the sprocket.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Sprocket.](#)

Caution:


- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of**

application.  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)



- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>ASSEMBLY.](#)

 [Go to 17.](#)



No


Remove the foreign matter. Replace the cam carrier oil filter (reuse not allowed).  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier.](#)

Caution:


- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.**  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>ASSEMBLY.](#)

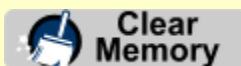
Note:



After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)

 [Go to 17.](#)

17. CHECK ON-BOARD MONITOR TEST RESULT.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)



2. Perform drive cycle T.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Drive Cycle.](#)
3. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE\$06.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>General Scan Tool.](#)

Caution:

- **When performing driving cycle, there should be 2 persons (driver and checker) and the checker should perform the data check.**
- **When performing the drive cycle on the public road, be very careful of the traffic condition and the safe driving must be the high priority.**

Note:


- **When the diagnostic value is 0, the diagnosis is incomplete. Therefore, do not stop the engine and perform the drive cycle again.**

- **Keep on checking the data during drive cycle because the diagnostic value is repeatedly updated.**


4. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 1] 1000 or more?

Yes

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

No


 [Go to 18.](#)

18. CHECK DTC.

Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 17.

Is the value of [VVT monitor bank 1] 1000 or less, and more than (value of [VVT monitor bank 2] × 1.5 + 100) compared with the value of [VVT monitor bank 2]?

Yes

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

No

End.

1. OUTLINE OF DIAGNOSIS

Detect the AVCS system malfunction.

Judge as NG when the conditions during which the differences of AVCS target timing advance amount and AVCS actual timing advance amount is large continues.

2. EXECUTION CONDITION

- Normal

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
AVCS control	In operation

- Intermediate lock

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Engine speed	≥ 500 rpm
Elapsed time after starting the engine	> 500 ms and

≤ Value from Map

Map

Engine coolant temperature °C (°F)	-40 (-40)	-30 (-22)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)
Elapsed time after starting the engine s	10	10	10	8	5	4	3	3

Engine coolant temperature °C (°F)	40 (104)	50 (122)	60 (140)	70 (158)	80 (176)	90 (194)	100 (212)	110 (230)
Elapsed time after starting the engine s	3	3	3	4	4	4	4	4

3. GENERAL DRIVING CYCLE

- Normal
Perform the diagnosis continuously while AVCS is operating.
- Intermediate lock
Perform the diagnosis when the AVCS is carrying out the intermediate lock control at the engine start.

4. DIAGNOSTIC METHOD

When the conditions during which the differences of AVCS target timing advance amount and AVCS actual timing advance amount is large continues for certain amount of time. Judge as NG when the following conditions are established within the predetermined time.

Judgment value

Malfunction Criteria	Threshold Value
• Normal (Target position - Actual position)	> 10°CA
• Intermediate lock (Target position - Actual position)	> 10°CA

Time needed for diagnosis:

- Normal: 10 seconds
- Intermediate lock: 2 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0013 "B" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

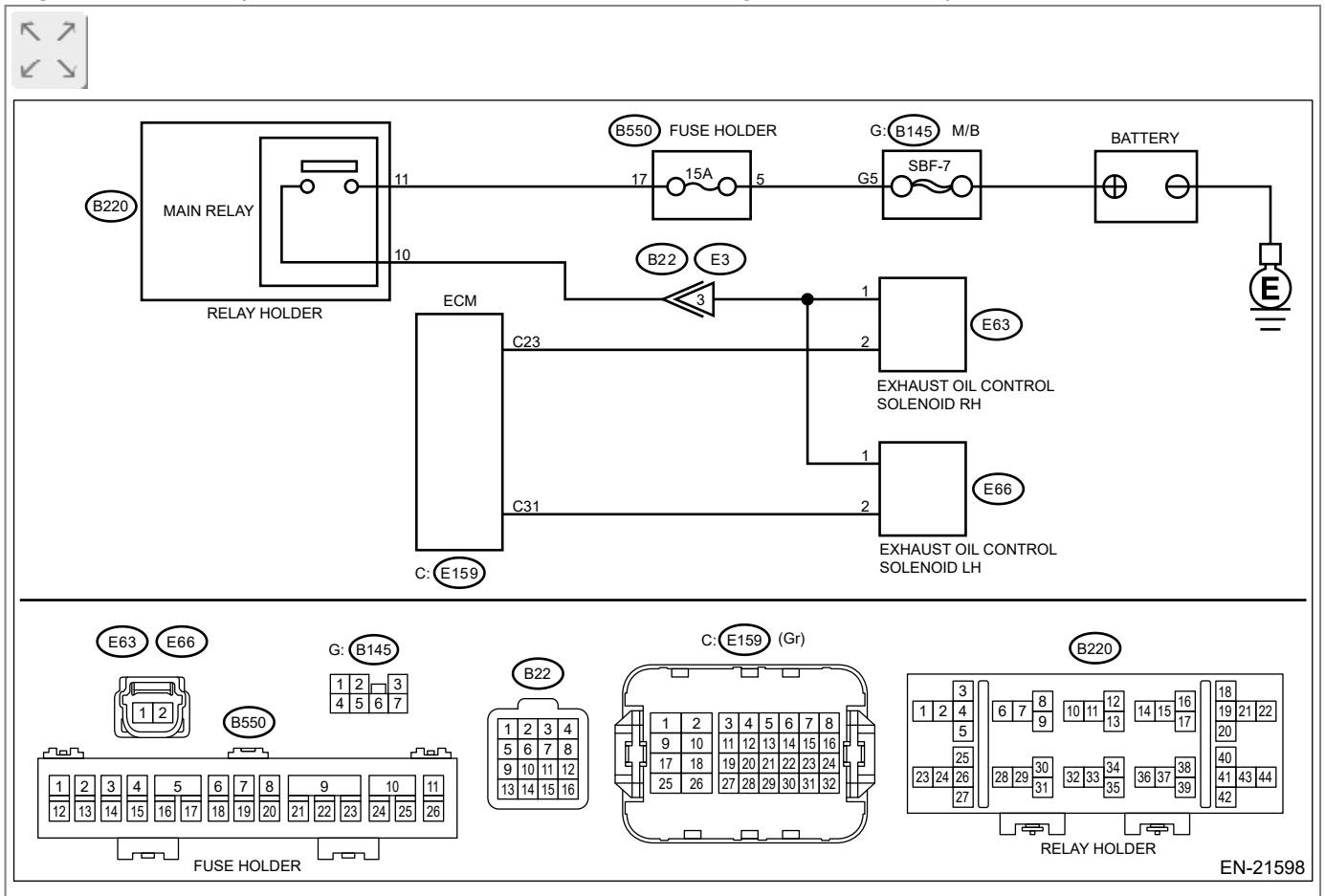
Improper idling

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK OUTPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and engine ground.


Connector & terminal




(E159) No. 23 (+) — Engine ground (—):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

 [Go to 3.](#)

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes

Repair the poor contact of ECM connector.

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

3. CHECK POWER SUPPLY TO THE EXHAUST OIL CONTROL SOLENOID RH.

Measure the voltage between exhaust oil control solenoid RH connector and engine ground.

Connector & terminal

(E63) No. 1 (+) — Engine ground (—):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

Repair the power supply circuit.

4. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH CONNECTOR.

1. Turn the ignition switch to OFF.

2. Disconnect the connector from the exhaust oil control solenoid RH.

3. Disconnect the connector from ECM.


4. Measure the resistance between exhaust oil control solenoid RH connector and engine ground.

Connector & terminal

(E63) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM and exhaust oil control solenoid RH connector.

5. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH CONNECTOR.

Measure the resistance of harness between ECM and exhaust oil control solenoid RH.

Connector & terminal

(E159) No. 23 — (E63) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 6.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and exhaust oil control solenoid RH connector**
- **Poor contact of coupling connector**

6. CHECK EXHAUST OIL CONTROL SOLENOID RH.

Measure the resistance between exhaust oil control solenoid RH terminals.

Terminals


No. 1 — No. 2:

Is the resistance 6 — 12 Ω ?

Yes

Repair the poor contact of exhaust oil control solenoid RH connector.

No

Replace the exhaust oil control solenoid RH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open/short circuit of oil control solenoid valve.

Judge as NG when the current is small even though the duty signal is large, or when the current is large even though the duty signal is small.

2. EXECUTION CONDITION

Diagnosis 1

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Oil control solenoid control duty	$\geq 99.6\%$

Diagnosis 2

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Oil control solenoid control duty	$< 8\%$

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Diagnosis 1

Judgment value

Malfunction Criteria	Threshold Value
Oil control solenoid control present current	$< 0.306 \text{ A}$

Diagnosis 2

Judgment value

Malfunction Criteria	Threshold Value
Oil control solenoid control present current	$\geq 0.306 \text{ A}$

Time needed for diagnosis: 2000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0014 "B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

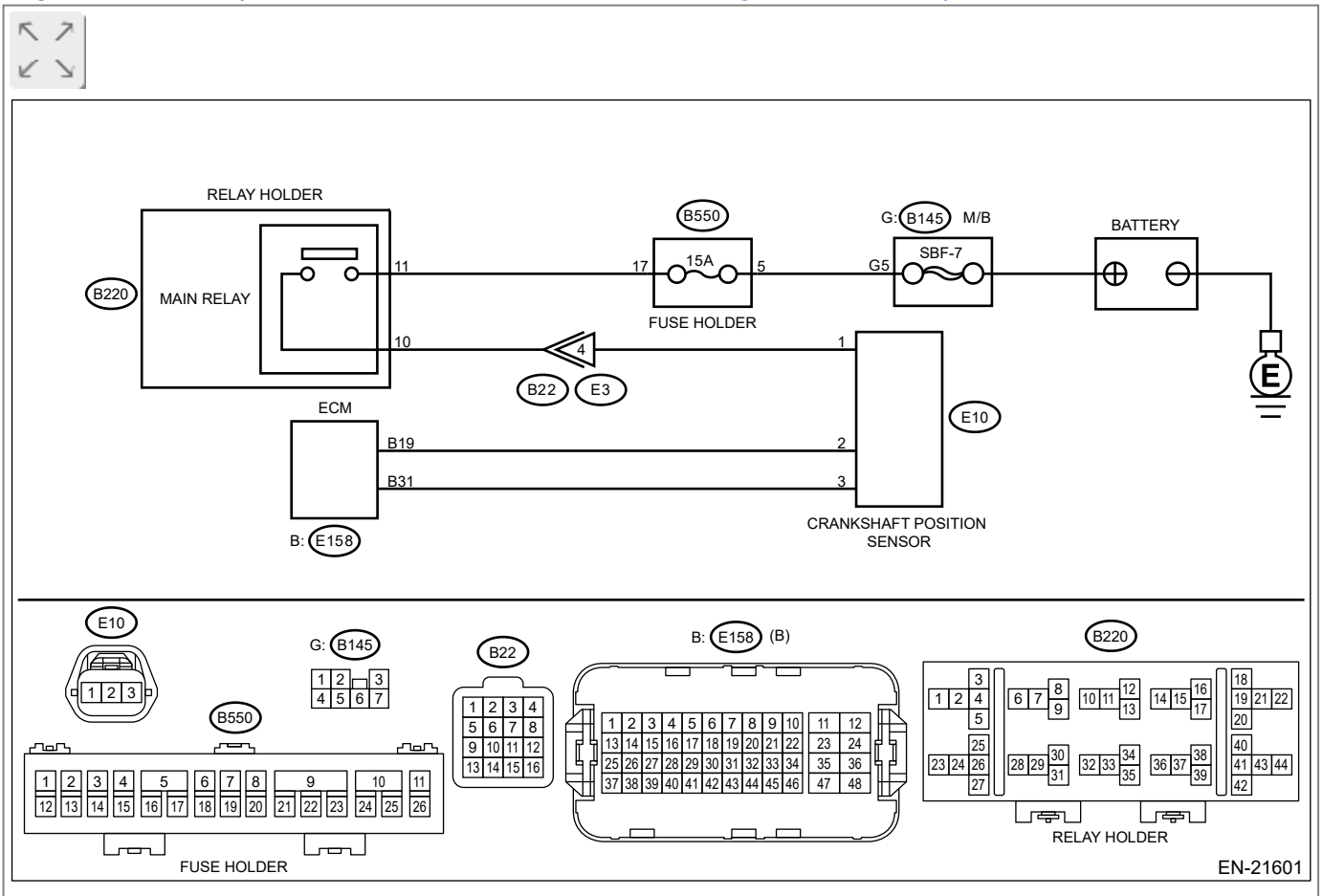
- Engine stalls.
- Improper idling

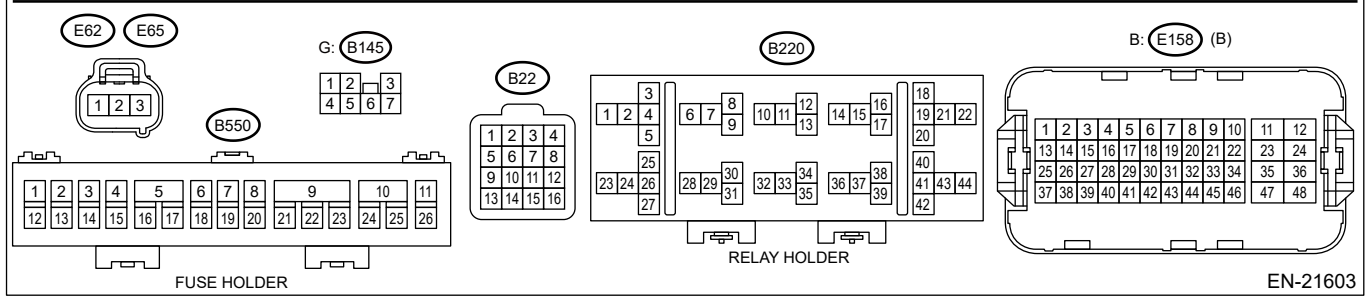
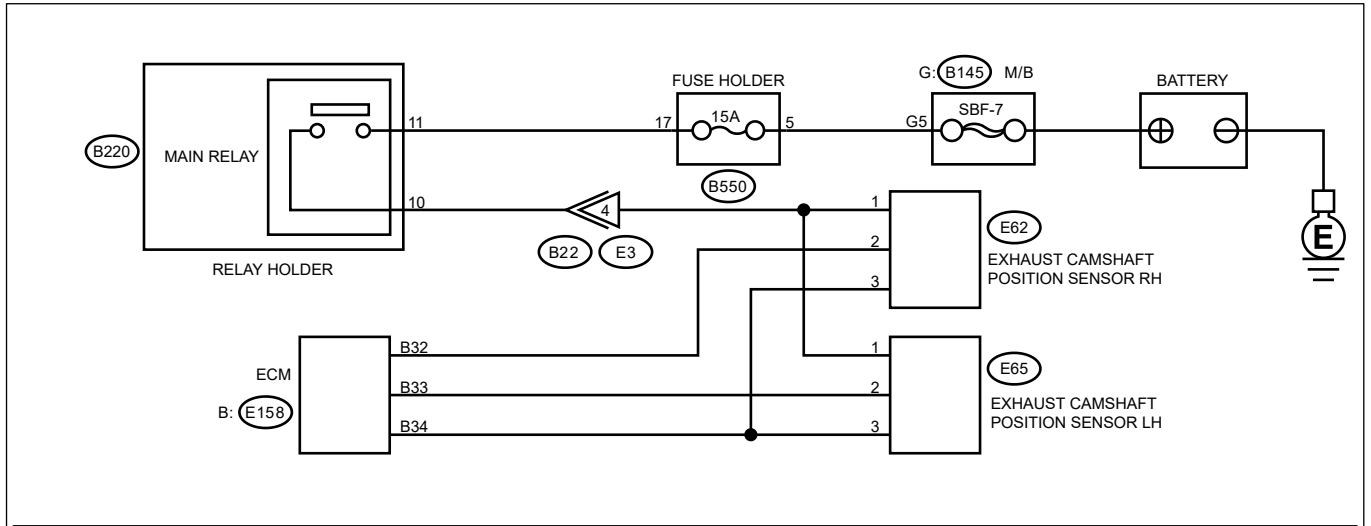
Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

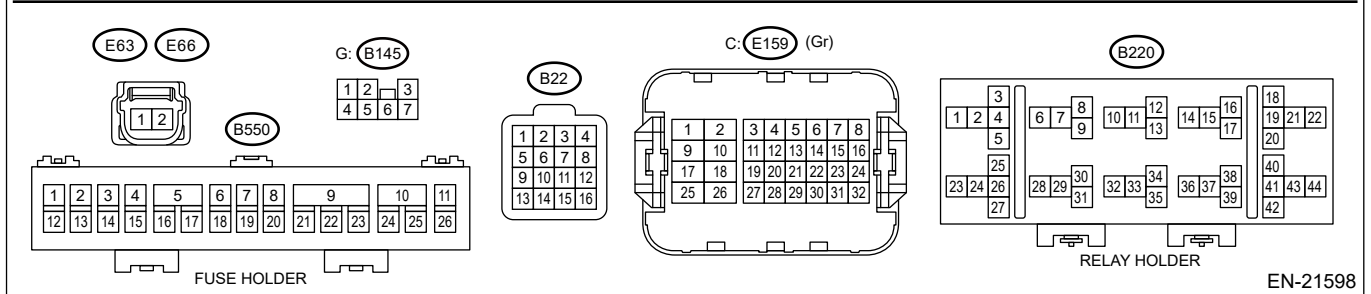
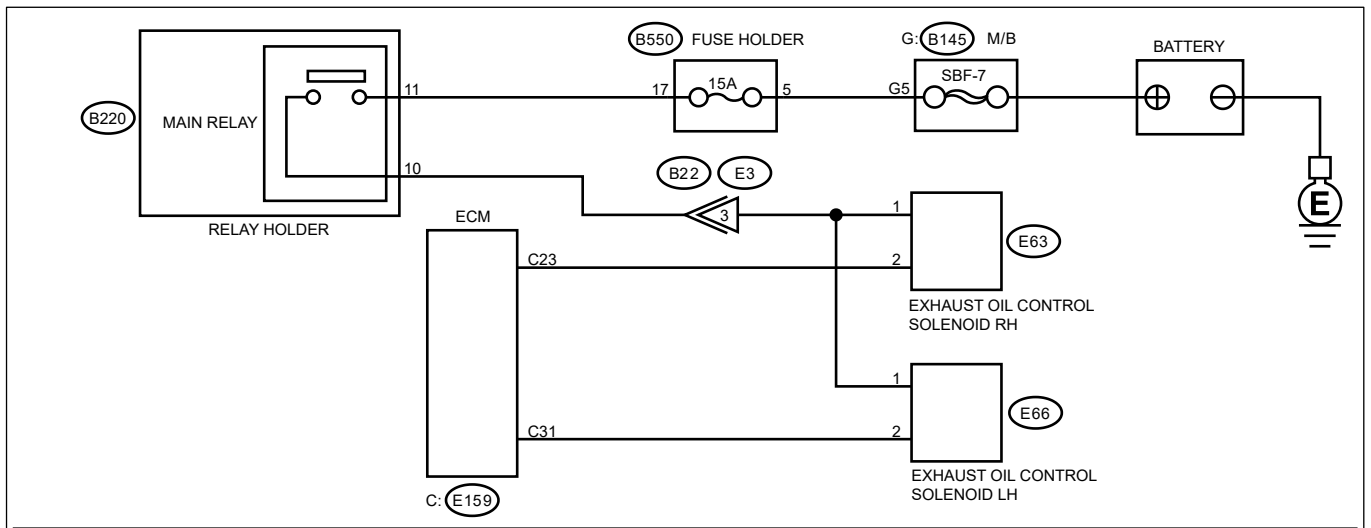
WIRING DIAGRAM:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.






EN-21603



EN-21598


1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)



DTC Check

Is DTC other than P000B and P0014 displayed? (Current malfunction)

Yes

Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)

No

Save the freeze frame data.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)
 [Go to 2.](#)

2. CHECK OUTPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and engine ground.

Connector & terminal

(E159) No. 23 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 3.](#)

No

 [Go to 4.](#)

3. CHECK FOR POOR CONTACT.

Check the ECM connector and harness.

Note:

Check the following items.

- Poor contact of ECM connector
- Temporary open or short circuit of harness
- Contamination, corrosion or looseness of engine ground terminal

Is the check result OK?

 [Go to 5.](#)

Yes

No

Repair or replace faulty parts.

4. CHECK POWER SUPPLY TO THE EXHAUST OIL CONTROL SOLENOID RH.


Measure the voltage between exhaust oil control solenoid RH connector and engine ground.

Connector & terminal

(E63) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 5.](#)

No

Repair the power supply circuit.

5. CHECK ENGINE OIL CONDITION.

Check the engine oil condition.

Note:

Check the following items.




- **Within the specified range in amount**
- **Excessively dirty**
- **Coagulated by additives**
- **Use of oil of specified viscosity**

Is the check result OK?


Yes


 [Go to 6.](#)

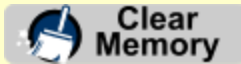
No



Adjust the oil amount, or replace the engine oil and engine oil filter.  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)
 [Go to 6.](#)

6. CHECK ON-BOARD MONITOR TEST RESULT.

1. Replace the exhaust oil control solenoid RH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)

2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)



3. Perform drive cycle T.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Drive Cycle.](#)
4. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE\$06.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>General Scan Tool.](#)

Caution:

- **When performing driving cycle, there should be 2 persons (driver and checker) and the checker should perform the data check.**
- **When performing the drive cycle on the public road, be very careful of the traffic condition and the safe driving must be the high priority.**

Note:

- **When the diagnostic value is 0, the diagnosis is incomplete. Therefore, do not stop the engine and perform the drive cycle again.**
- **Always keep on checking the data while reading out the diagnostic value because the diagnostic value is repeatedly updated.**

5. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 1] of the replaced oil control solenoid 1000 or more?

Yes

 [Go to 8.](#)

No

 [Go to 7.](#)

7. CHECK ON-BOARD MONITOR TEST RESULT.




Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 6.

Is the value of [VVT monitor bank 1] 1000 or less, and more than (value of [VVT monitor bank 2] $\times 1.5 + 100$) compared with the value of [VVT monitor bank 2]?

Yes

 [Go to 8.](#)

No





Idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)
 [Go to 17.](#)

8. CHECK HARNESS AND CONNECTOR.

Check for a bend, damage and poor contact of harness and connector.

Note:

Check the following items.





- **ECM**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)
- **Oil control solenoid**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Oil Control Solenoid>INSPECTION.](#)
- **Camshaft position sensor**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Camshaft Position Sensor>INSPECTION.](#)
- **Crankshaft position sensor**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor Plate>INSPECTION.](#)


Is the check result OK?

Yes

 [Go to 9.](#)

No

Repair or replace faulty parts.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\)>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Camshaft Position Sensor.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor Plate.](#)

 [Go to 9.](#)

9. CHECK HARNESS AND CONNECTOR (OPEN).




1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the exhaust oil control solenoid RH.
4. Measure the resistance between exhaust oil control solenoid RH connector and ECM connector.

Connector & terminal

(E159) No. 23 — (E63) No. 2:


Is the resistance less than 1 Ω?

Yes

 [Go to 10.](#)

No

Repair or replace faulty parts.

 [Go to 17.](#)

10. CHECK HARNESS AND CONNECTOR (OPEN).




1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the exhaust camshaft position sensor RH.
4. Measure the resistance between the exhaust camshaft position sensor RH connector and ECM connector.

Connector & terminal

(E158) No. 32 — (E62) No. 2:


Is the resistance less than 1 Ω ?

Yes

 [Go to 11.](#)

No

Repair or replace faulty parts.

 [Go to 17.](#)

11. CHECK HARNESS AND CONNECTOR (OPEN).




1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the crankshaft position sensor.
4. Measure the resistance between the crankshaft position sensor connector and ECM connector.

Connector & terminal

(E158) No. 19 — (E10) No. 2:


Is the resistance less than 1 Ω ?

Yes

 [Go to 12.](#)


No

Repair or replace faulty parts.

 [Go to 17.](#)


12. CHECK ENGINE OIL PRESSURE.




Check the engine oil pressure.  [Ref. to MECHANICAL\(H4DOTC\)>Engine Oil Pressure>INSPECTION.](#)

Is the oil pressure of engine oil normal?

Yes

 [Go to 14.](#)

No

 [Go to 13.](#)

13. CHECK OIL STRAINER.



Check the oil strainer. [Ref. to LUBRICATION\(H4DO\)>Oil Pan>INSPECTION.](#)

Does any foreign matter exist at the oil strainer in the oil pan?

Yes

Check and clean inside the oil strainer.

[Go to 14.](#)

No

Replace the chain cover. [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover.](#)

Caution:

Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)

[Go to 15.](#)

14. CHECK OIL PATH OF CHAIN COVER.



1. Remove the engine from the vehicle. [Ref. to MECHANICAL\(H4DOTC\)>Engine Assembly>REMOVAL.](#)
2. Check the oil path of the chain cover. [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSPECTION.](#)

Note:

Check the O-rings in the following oil path and also check that no foreign matter exists.

- Inlet of oil pump
- Outlet of oil pump
- Each O-ring in the path leading to left/right cylinder head
- Oil control solenoid
- Foreign matter exists

Is the check result OK?

Yes

[Go to 15.](#)


No

Replace faulty parts. If there is any foreign matter, replace the chain cover.

[Ref. to MECHANICAL\(H4DOTC\)>Chain Cover.](#)

[Go to 15.](#)

15. CHECK THE CAMSHAFT CONDITION.

1. Remove the timing chain.  [Ref. to MECHANICAL\(H4DOTC\)>Timing Chain Assembly>REMOVAL.](#)
2. Rotate the camshaft by hand to compare the rotational resistance of the four.


Note:

Check the following items if there is a clearly faulty condition in the camshaft (bank 1) such as restriction or rotational resistance by comparing it with the rotational resistance of the camshaft (bank 2).



- Foreign matter attached to camshaft
- Damage of camshaft (scratching, galling, wear, etc.)
- Check for consequence from improper rotation of cam journal bearing


Is the check result OK?

Yes

 [Go to 16.](#)

No

Replace the cam carrier and camshaft.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier.](#)  [Ref. to MECHANICAL\(H4DOTC\)>Camshaft.](#)


 [Go to 16.](#)

16. CHECK OIL PASSAGE BETWEEN OIL PUMP AND OIL CONTROL SOLENOID.

Visually check the following parts of the oil passage from the oil pump to the oil control solenoid to check obvious defectiveness such as foreign matter, clogging, etc.

- Oil passage in cam Carrier
- Oil passage on cylinder head side
- Oil passage at the joint between cam sprocket and camshaft
- Oil passage at the back of sprocket and the end of camshaft when the sprocket is removed

Note:

Refer to removal procedure of cam carrier in service manual.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>REMOVAL.](#)


Is the check result OK?


Yes


Replace the sprocket.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Sprocket.](#)

Caution:


- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of**

application.  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)



- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>ASSEMBLY.](#)

 [Go to 17.](#)



No


Remove the foreign matter. Replace the cam carrier oil filter (reuse not allowed).  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier.](#)

Caution:


- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.**  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>ASSEMBLY.](#)

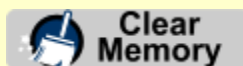
Note:



After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)

 [Go to 17.](#)

17. CHECK ON-BOARD MONITOR TEST RESULT.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)



2. Perform drive cycle T.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Drive Cycle.](#)
3. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE\$06.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>General Scan Tool.](#)

Caution:

- **When performing driving cycle, there should be 2 persons (driver and checker) and the checker should perform the data check.**
- **When performing the drive cycle on the public road, be very careful of the traffic condition and the safe driving must be the high priority.**

Note:


- **When the diagnostic value is 0, the diagnosis is incomplete. Therefore, do not stop the engine and perform the drive cycle again.**

- Keep on checking the data during drive cycle because the diagnostic value is repeatedly updated.


4. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 1] 1000 or more?

Yes

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

No


 [Go to 18.](#)

18. CHECK DTC.

Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 17.

Is the value of [VVT monitor bank 1] 1000 or less, and more than (value of [VVT monitor bank 2] × 1.5 + 100) compared with the value of [VVT monitor bank 2]?

Yes

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

No

End.

1. OUTLINE OF DIAGNOSIS

Detect the exhaust AVCS system malfunction.

Judge as NG when the conditions during which the differences of exhaust AVCS target timing advance amount and exhaust AVCS actual timing advance amount is large continues.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Exhaust AVCS control	In operation

3. GENERAL DRIVING CYCLE

Ignition switch ON → OFF

Ignition switch OFF → ON (Only after clearing memory)

4. DIAGNOSTIC METHOD

When the conditions during which the differences of exhaust AVCS target timing advance amount and exhaust AVCS actual timing advance amount is large continues for certain amount of time.

Judge as NG when the following conditions are established within the predetermined time.

Judgment value

Malfunction Criteria	Threshold Value
(Target position – Actual position)	> 10°CA

Time needed for diagnosis: 10 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0016 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR A



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

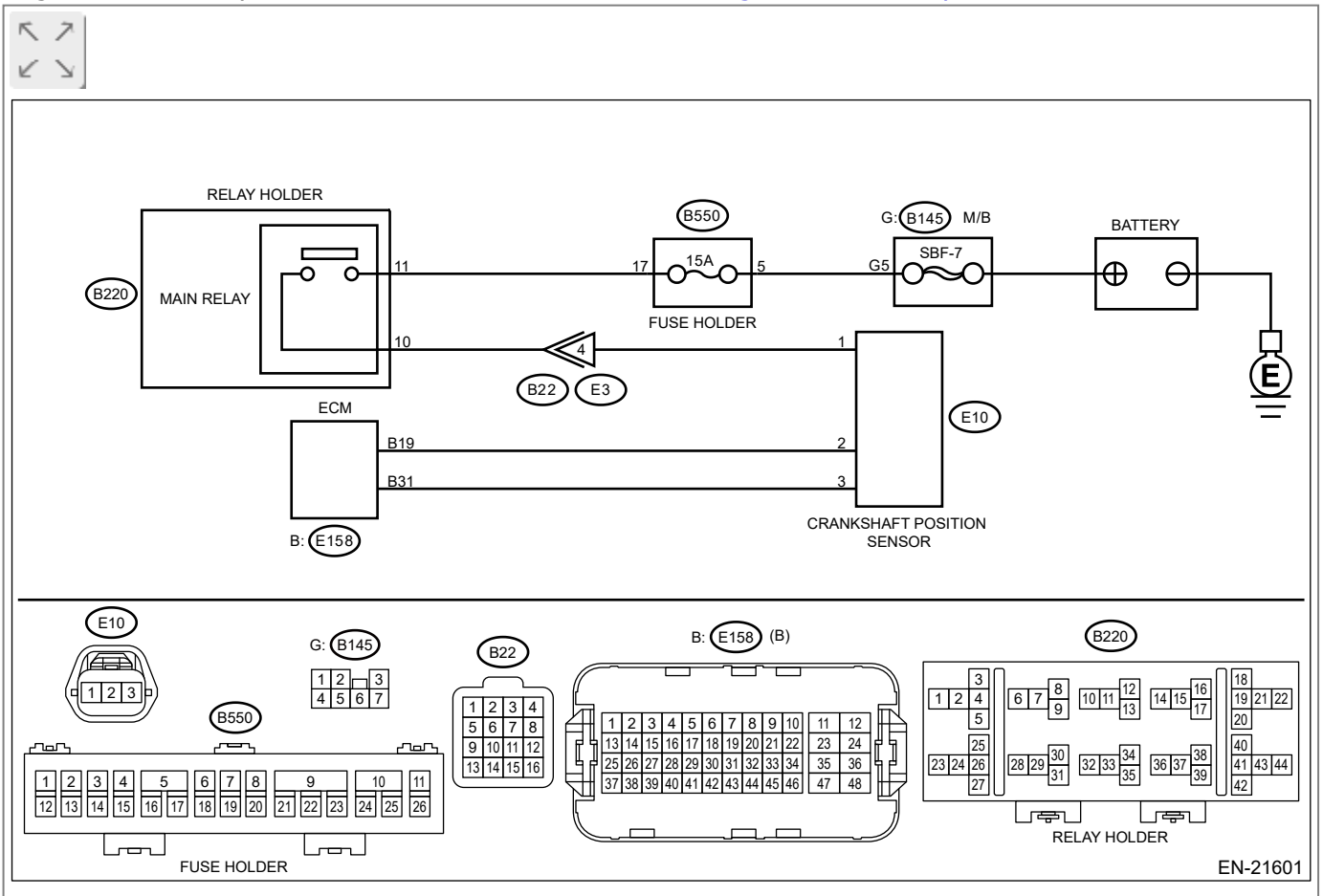
- Engine stalls.
- Improper idling

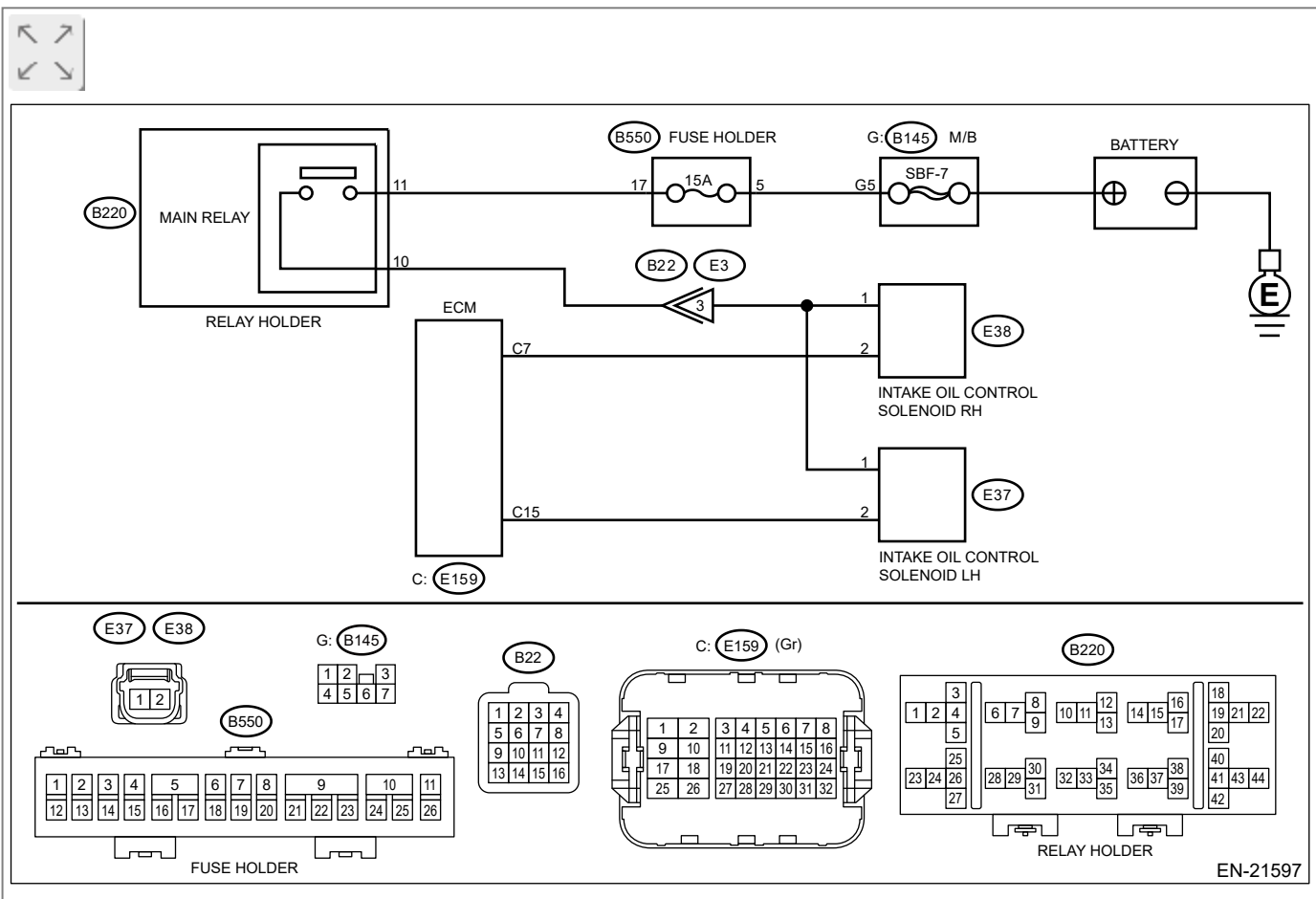
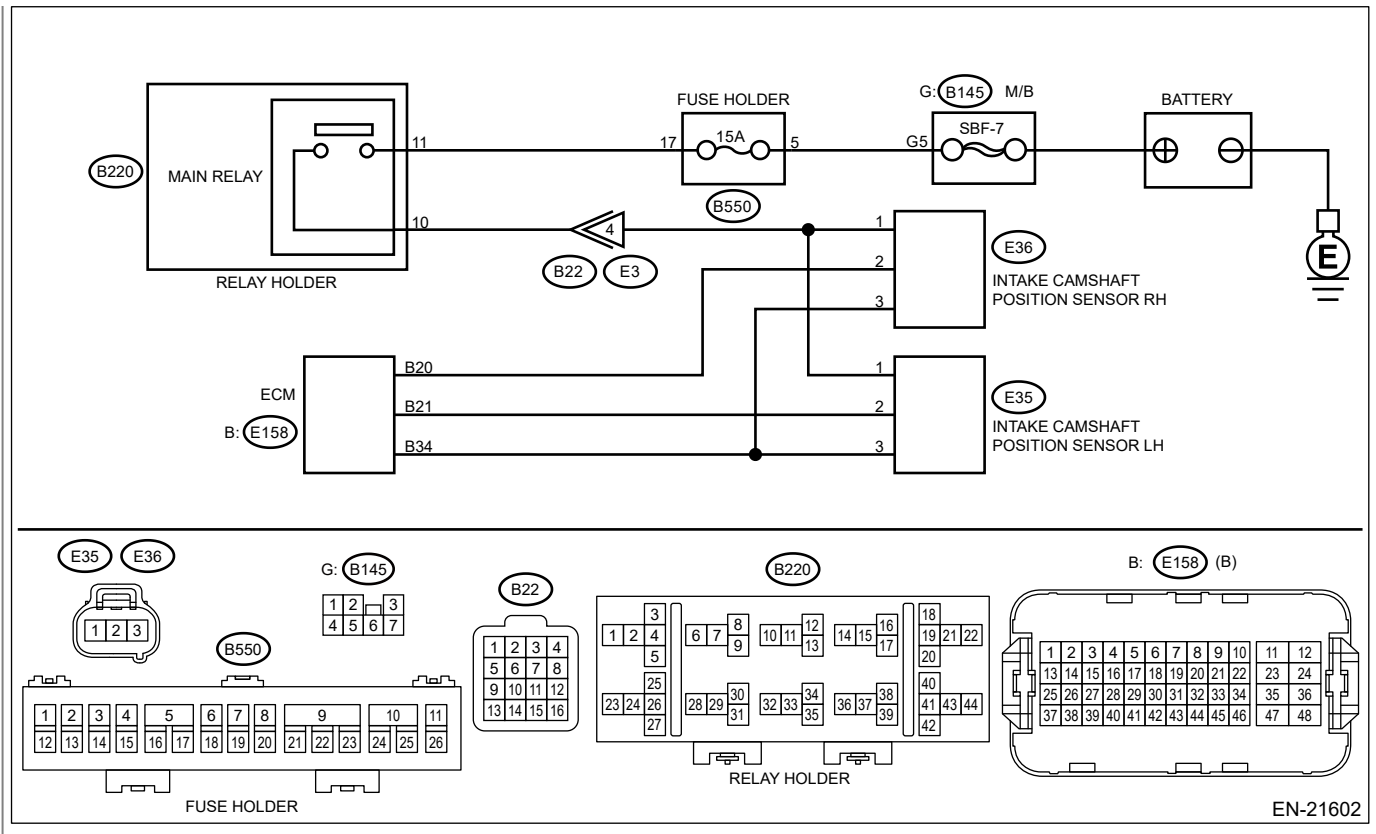
Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode>OPERATION.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode>PROCEDURE.](#)


WIRING DIAGRAM:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)






1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)



DTC Check

Is DTC other than P0016 displayed? (Current malfunction)

Yes

Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)

No

Save the freeze frame data.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)  [Go to 2.](#)

2. CHECK ENGINE OIL CONDITION.

Check the engine oil condition.

Note:

Check the following items.




- **Within the specified range in amount**
- **Excessively dirty**
- **Coagulated by additives**
- **Use of oil of specified viscosity**

Is the check result OK?


Yes

 [Go to 3.](#)

No

Adjust the oil amount, or replace the engine oil and engine oil filter.  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)  [Go to 3.](#)

3. CHECK TIMING CHAIN.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)



2. Turn the ignition switch to OFF.
3. Disconnect the connector of the intake oil control solenoid RH. (DTC will be set but this will not affect the inspection)
4. Turn the ignition switch to ON.
5. Start monitoring [VVT Adv. Ang. Amount R] on the data monitor.
6. Start the engine.
7. Read [VVT Adv. Ang. Amount R] within 10 seconds after engine is started.

Note:

The display will indicate [0] by judging the position as standard after 10 seconds elapse since the engine was started.

8. Record the readings [VVT Adv. Ang. Amount R].
9. Stop the engine.

Is [VVT Adv. Ang. Amount R] out of standard (0 deg) by ± 10 deg or more within 10 seconds after starting?

Yes

Repair the timing chain. [Ref. to MECHANICAL\(H4DOTC\)>Timing_Chain Assembly.](#)

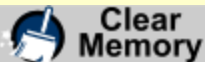
[Go to 15.](#)

No

[Go to 4.](#)

4. CHECK ON-BOARD MONITOR TEST RESULT.

1. Replace the intake oil control solenoid RH. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)



3. Perform drive cycle T. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Drive Cycle.](#)
4. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE\$06. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>General Scan Tool.](#)

Caution:

- **When performing driving cycle, there should be 2 persons (driver and checker) and the checker should perform the data check.**
- **When performing the drive cycle on the public road, be very careful of the traffic condition and the safe driving must be the high priority.**


Note:

- When the diagnostic value is 0, the diagnosis is incomplete. Therefore, do not stop the engine and perform the drive cycle again.
- Keep on checking the data during drive cycle because the diagnostic value is repeatedly updated.


5. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 1] of the replaced oil control solenoid 1000 or more?

Yes

 [Go to 6.](#)

No


 [Go to 5.](#)

5. CHECK ON-BOARD MONITOR TEST RESULT.



Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 4.

Is the value of [VVT monitor bank 1] 1000 or less, and more than (value of [VVT monitor bank 2] × 1.5 + 100) compared with the value of [VVT monitor bank 2]?


Yes

 [Go to 6.](#)

No

Idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#) 

[Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)





 [Go to 15.](#)

6. CHECK HARNESS AND CONNECTOR.

Check for a bend, damage and poor contact of harness and connector.

Note:

Check the following items.






- ECM  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)
- Oil control solenoid  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Oil Control Solenoid>INSPECTION.](#)
- Camshaft position sensor  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Camshaft Position Sensor>INSPECTION.](#)
- Crankshaft position sensor  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor Plate>INSPECTION.](#)

Is the check result OK?

 [Go to 7.](#)

Yes

No

Repair or replace faulty parts.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\)>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Camshaft Position Sensor.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor Plate.](#)
 [Go to 7.](#)

7. CHECK HARNESS AND CONNECTOR (OPEN).


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the intake oil control solenoid RH.
4. Measure the resistance between intake oil control solenoid RH connector and ECM connector.

Connector & terminal


(E159) No. 7 — (E38) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 8.](#)

No

Repair or replace faulty parts.
 [Go to 15.](#)

8. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the intake camshaft position sensor RH.
4. Measure the resistance between the intake camshaft position sensor RH connector and ECM connector.

Connector & terminal

(E158) No. 20 — (E36) No. 2:


Is the resistance less than 1 Ω ?

Yes

 [Go to 9.](#)

No

Repair or replace faulty parts.

 [Go to 15.](#)

9. CHECK HARNESS AND CONNECTOR (OPEN).


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the crankshaft position sensor.
4. Measure the resistance between the crankshaft position sensor connector and ECM connector.

Connector & terminal

(E158) No. 19 – (E10) No. 2:


Is the resistance less than 1 Ω ?

Yes


 [Go to 10.](#)

No

Repair or replace faulty parts.

 [Go to 15.](#)

10. CHECK ENGINE OIL PRESSURE.

Check the engine oil pressure.  [Ref. to MECHANICAL\(H4DOTC\)>Engine Oil Pressure>INSPECTION.](#)

Is the oil pressure of engine oil normal?

Yes

 [Go to 12.](#)

No

 [Go to 11.](#)


11. CHECK OIL STRAINER.

Check the oil strainer.  [Ref. to LUBRICATION\(H4DO\)>Oil Pan>INSPECTION.](#)

Does any foreign matter exist at the oil strainer in the oil pan?

Yes


Check and clean inside the oil strainer.


 [Go to 12.](#)

No



Replace the chain cover.  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover.](#)

Caution:

Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.  Ref. to [MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)

 [Go to 13.](#)

12. CHECK OIL PATH OF CHAIN COVER.

1. Remove the engine from the vehicle.  [Ref. to MECHANICAL\(H4DOTC\)>Engine Assembly>REMOVAL.](#)
2. Check the oil path of the chain cover.  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSPECTION.](#)


Note:

Check the O-rings in the following oil path and also check that no foreign matter exists.

- Inlet of oil pump
- Outlet of oil pump
- Each O-ring in the path leading to left/right cylinder head
- Oil control solenoid
- Foreign matter exists


Is the check result OK?


Yes

 [Go to 13.](#)


No

Replace faulty parts. If there is any foreign matter, replace the chain cover.

 [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover.](#)

 [Go to 13.](#)

13. CHECK THE CAMSHAFT CONDITION.

1. Remove the timing chain.  [Ref. to MECHANICAL\(H4DOTC\)>Timing Chain Assembly>REMOVAL.](#)
2. Rotate the camshaft by hand to compare the rotational resistance of the four.


Note:

Check the following items if there is a clearly faulty condition in the camshaft (bank 1) such as restriction or rotational resistance by comparing it with the rotational resistance of the camshaft (bank 2).




- Foreign matter attached to camshaft
- Damage of camshaft (scratching, galling, wear, etc.)
- Check for consequence from improper rotation of cam journal bearing

Is the check result OK?

Yes

 [Go to 14.](#)

No

Replace the cam carrier and camshaft.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier.](#)  [Ref. to MECHANICAL\(H4DOTC\)>Camshaft.](#)
 [Go to 14.](#)


14. CHECK OIL PASSAGE FROM OIL PUMP TO OIL CONTROL SOLENOID.



Visually check the following parts of the oil passage from the oil pump to the oil control solenoid to check obvious defectiveness such as foreign matter, clogging, etc.

- Oil passage in cam Carrier
- Oil passage on cylinder head side
- Oil passage at the joint between cam sprocket and camshaft
- Oil passage at the back of sprocket and the end of camshaft when the sprocket is removed

Note:



Refer to removal procedure of cam carrier in service manual.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>REMOVAL.](#)


Is the check result OK?

Yes


Replace the sprocket.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Sprocket.](#)

Caution:


- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.**  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>ASSEMBLY.](#)


 [Go to 15.](#)

No



Remove the foreign matter. Replace the cam carrier oil filter (reuse not allowed).  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier.](#)


Caution:

- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.**  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)


- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>ASSEMBLY.](#)

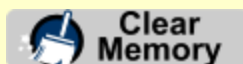
Note:


After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)

 [Go to 15.](#)

15. CHECK CURRENT DATA (LEARNING VALUE ERROR).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)



3. Using the Subaru Select Monitor, read the data monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
4. Read the current value of [VVT Initial Position Learning Value #1].
5. Find the sum value of read [VVT Initial Position Learning Value #1] and [VVT Adv. Ang. Amount R] recorded in step 3.

Is the sum value within standard?


Standard:

45 — 74

Yes

ECM is good; finish the diagnosis.

No

Replace the ECM and perform drive cycle N. When DTC is not displayed, end the diagnosis.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

1. OUTLINE OF DIAGNOSIS

Detect the AVCS system malfunction.

Judge as NG when standard timing advance amount is far from learning angle.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V

Elapsed time after external load (power steering, neutral position switch) change	≥ 3 s
AVCS position learning	In operation
Actual timing advance change amount (for 10 ms)	$< 1^{\circ}\text{CA}$

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after starting engine and while AVCS is not operating.

4. DIAGNOSTIC METHOD

Judge as NG when the absolute value of the difference between cam signal input position and learning value is out of specification.

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Diagnosis 1

Judgment value

Malfunction Criteria	Threshold Value
Crankshaft position when camshaft position sensor signal is input – Learning value	$> 10^{\circ}\text{CA}$

Diagnosis 2

Judgment value

Malfunction Criteria	Threshold Value
Camshaft position sensor signal input position (bank 1)	$< 50.9^{\circ}\text{CA}$ or $> 109.8^{\circ}\text{CA}$
Camshaft position sensor signal input position (bank 2)	$< 52.3^{\circ}\text{CA}$ or $> 110.3^{\circ}\text{CA}$

Time needed for diagnosis: 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

Note:

Initial standard learning value is the value of crank angle initially input at the production plant. And then it will be updated every time normal judgment has been completed. Learning value will not be updated if NG judgment occurs because timing belt or chain derails suddenly in process or because wrong assembly occurs during servicing.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0017 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR B



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

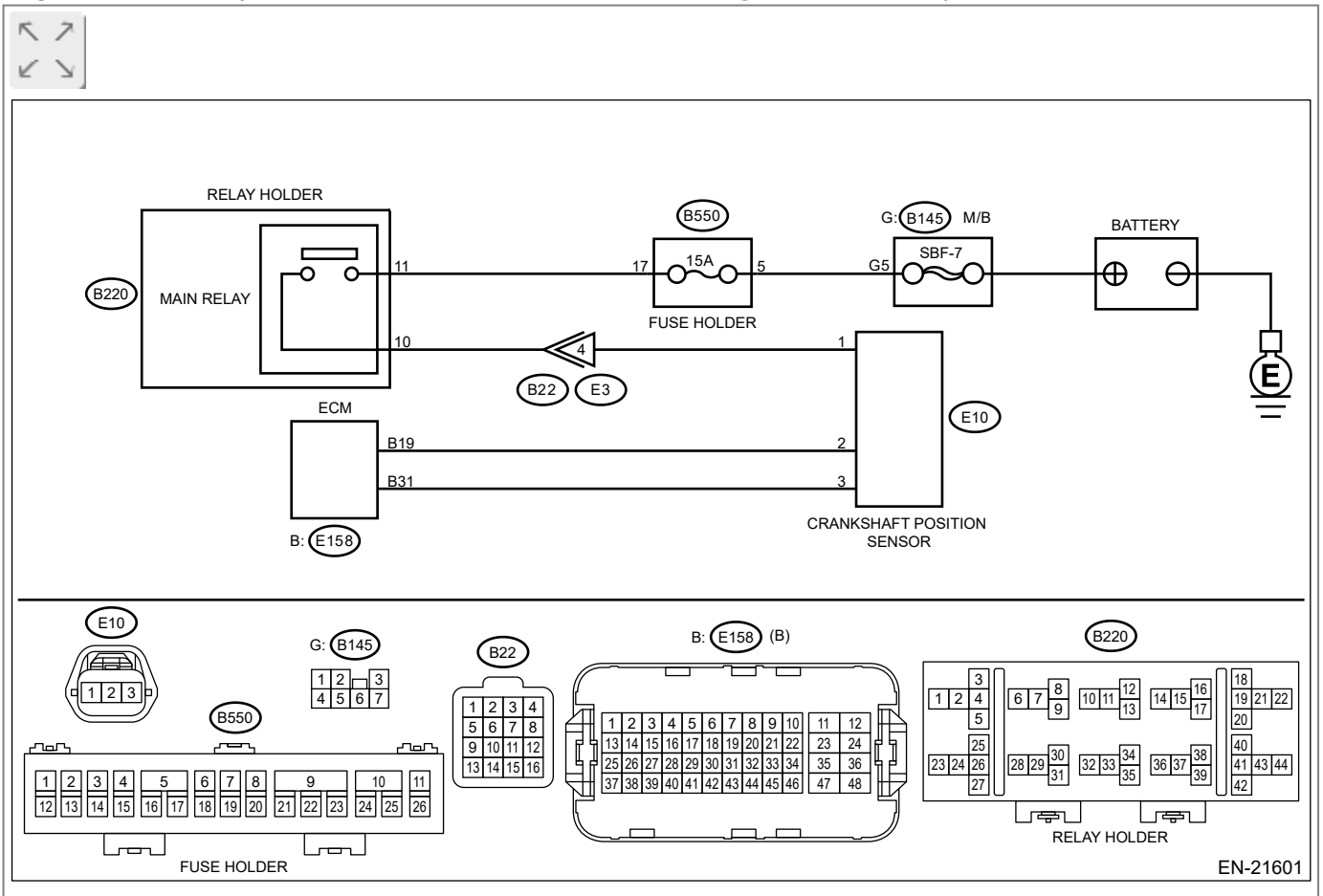
- Engine stalls.
- Improper idling

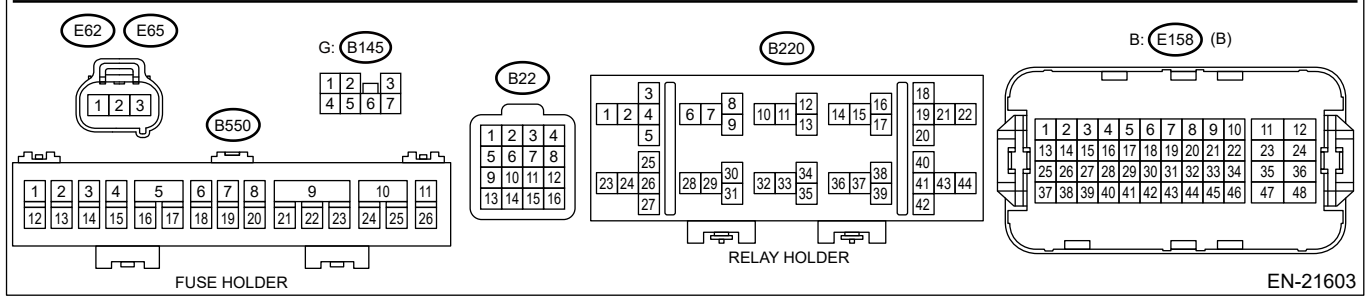
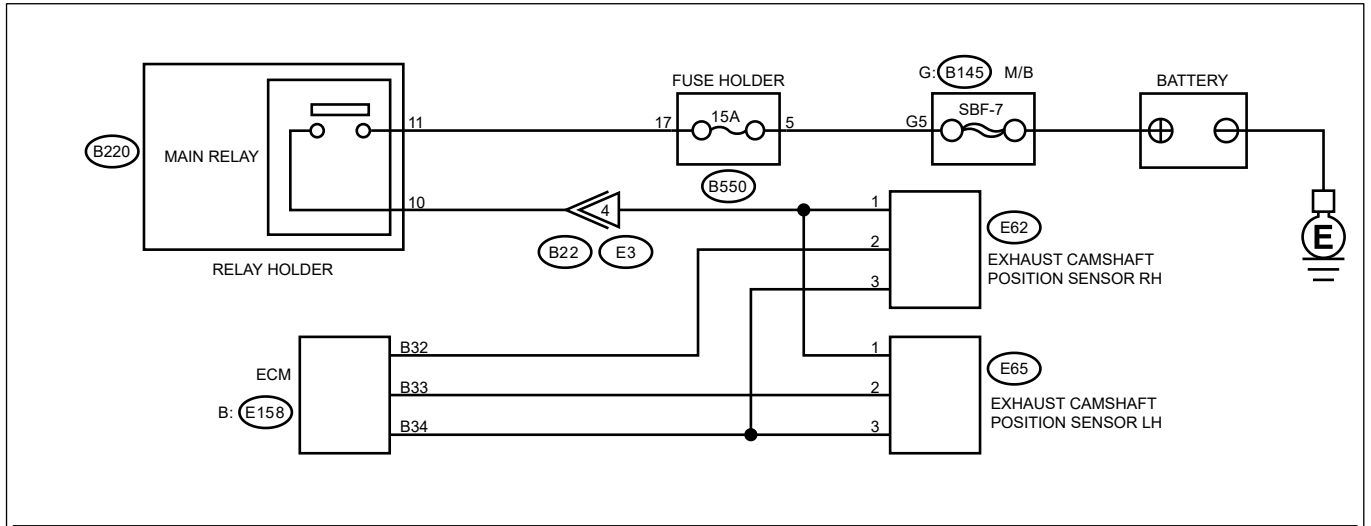
Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

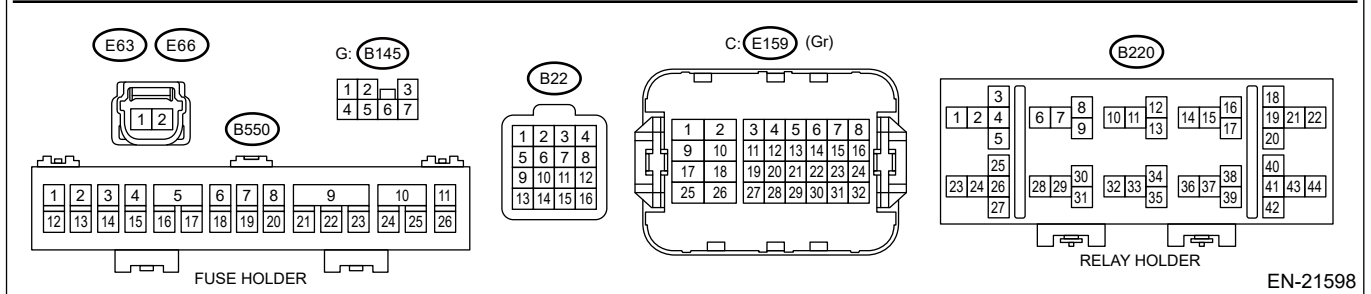
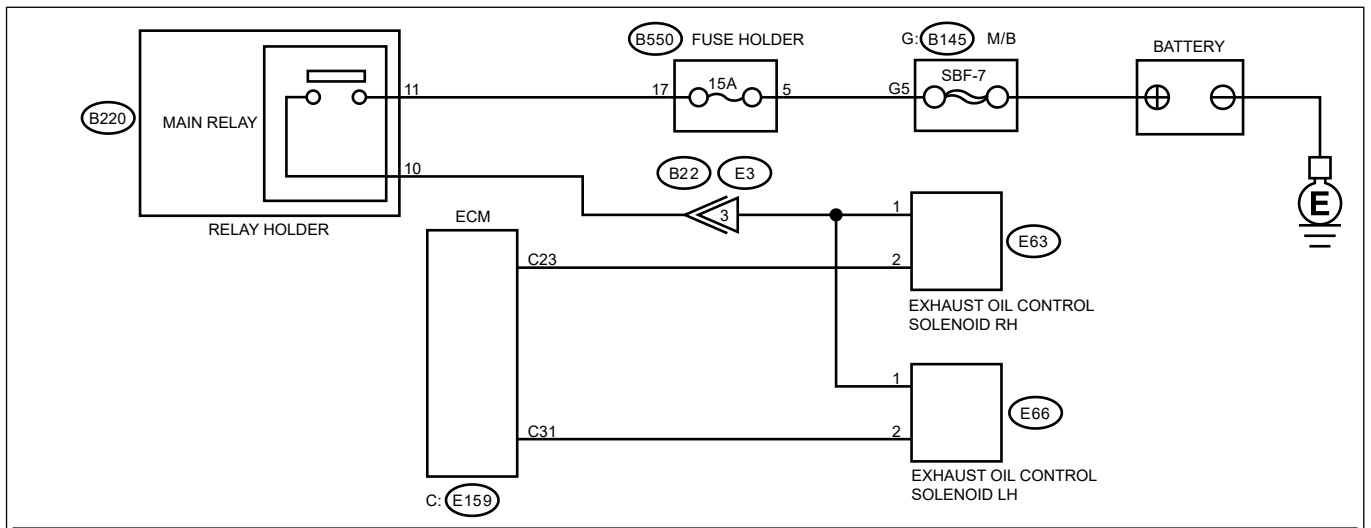
WIRING DIAGRAM:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.






EN-21603



EN-21598


1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)



DTC Check

Is DTC other than P0017 displayed? (Current malfunction)

Yes

Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)

No

Save the freeze frame data.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)  [Go to 2.](#)

2. CHECK ENGINE OIL CONDITION.

Check the engine oil condition.

Note:

Check the following items.




- **Within the specified range in amount**
- **Excessively dirty**
- **Coagulated by additives**
- **Use of oil of specified viscosity**

Is the check result OK?


Yes

 [Go to 3.](#)

No

Adjust the oil amount, or replace the engine oil and engine oil filter.  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)  [Go to 3.](#)

3. CHECK TIMING CHAIN.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)



2. Turn the ignition switch to OFF.
3. Disconnect the connector of the exhaust oil control solenoid RH. (DTC will be set but this will not affect the inspection)
4. Turn the ignition switch to ON.
5. Start monitoring [Exh. VVT Retard Ang. R] on the data monitor.
6. Start the engine.
7. Read [Exh. VVT Retard Ang. R] within 10 seconds after engine is started.

Note:

The display will indicate [0] by judging the position as standard after 10 seconds elapse since the engine was started.

8. Record the readings [Exh. VVT Retard Ang. R].
9. Stop the engine.

Is [Exh. VVT Retard Ang. R] out of standard (0 deg) by ± 10 deg or more within 10 seconds after starting?

Yes

Repair the timing chain. [Ref. to MECHANICAL\(H4DOTC\)>Timing Chain Assembly.](#)

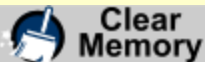
[Go to 15.](#)

No

[Go to 4.](#)

4. CHECK ON-BOARD MONITOR TEST RESULT.

1. Replace the exhaust oil control solenoid RH. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)



3. Perform drive cycle T. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Drive Cycle.](#)
4. Using the Subaru Select Monitor, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE\$06. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>General Scan Tool.](#)

Caution:

- **When performing driving cycle, there should be 2 persons (driver and checker) and the checker should perform the data check.**
- **When performing the drive cycle on the public road, be very careful of the traffic condition and the safe driving must be the high priority.**


Note:

- When the diagnostic value is 0, the diagnosis is incomplete. Therefore, do not stop the engine and perform the drive cycle again.
- Keep on checking the data during drive cycle because the diagnostic value is repeatedly updated.


5. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 1] of the replaced oil control solenoid 1000 or more?

Yes

 [Go to 6.](#)

No

 [Go to 5.](#)

5. CHECK ON-BOARD MONITOR TEST RESULT.




Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 4.

Is the value of [VVT monitor bank 1] 1000 or less, and more than (value of [VVT monitor bank 2] × 1.5 + 100) compared with the value of [VVT monitor bank 2]?

Yes

 [Go to 6.](#)

No





Idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)
 [Go to 15.](#)

6. CHECK HARNESS AND CONNECTOR.

Check for a bend, damage and poor contact of harness and connector.

Note:

Check the following items.






- ECM  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)
- Oil control solenoid  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Oil Control Solenoid>INSPECTION.](#)
- Camshaft position sensor  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Camshaft Position Sensor>INSPECTION.](#)
- Crankshaft position sensor  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor Plate>INSPECTION.](#)

Is the check result OK?

 [Go to 7.](#)

Yes

No

Repair or replace faulty parts.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\)>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Camshaft Position Sensor.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor Plate.](#)
 [Go to 7.](#)

7. CHECK HARNESS AND CONNECTOR (OPEN).


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the exhaust oil control solenoid RH.
4. Measure the resistance between exhaust oil control solenoid RH connector and ECM connector.

Connector & terminal


(E159) No. 23 — (E63) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 8.](#)

No

Repair or replace faulty parts.
 [Go to 15.](#)

8. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the exhaust camshaft position sensor RH.
4. Measure the resistance between the exhaust camshaft position sensor RH connector and ECM connector.

Connector & terminal

(E158) No. 32 — (E62) No. 2:


Is the resistance less than 1 Ω ?

Yes

 [Go to 9.](#)

No

Repair or replace faulty parts.

 [Go to 15.](#)

9. CHECK HARNESS AND CONNECTOR (OPEN).


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the crankshaft position sensor.
4. Measure the resistance between the crankshaft position sensor connector and ECM connector.

Connector & terminal

(E158) No. 19 – (E10) No. 2:


Is the resistance less than 1 Ω ?

Yes


 [Go to 10.](#)

No

Repair or replace faulty parts.

 [Go to 15.](#)

10. CHECK ENGINE OIL PRESSURE.


Check the engine oil pressure.  [Ref. to MECHANICAL\(H4DOTC\)>Engine Oil Pressure>INSPECTION.](#)

Is the oil pressure of engine oil normal?

Yes

 [Go to 12.](#)

No

 [Go to 11.](#)


11. CHECK OIL STRAINER.

Check the oil strainer.  [Ref. to LUBRICATION\(H4DO\)>Oil Pan>INSPECTION.](#)

Does any foreign matter exist at the oil strainer in the oil pan?

Yes


Check and clean inside the oil strainer.


 [Go to 12.](#)

No



Replace the chain cover.  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover.](#)

Caution:

Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.  Ref. to [MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)

 [Go to 13.](#)

12. CHECK OIL PATH OF CHAIN COVER.

1. Remove the engine from the vehicle.  [Ref. to MECHANICAL\(H4DOTC\)>Engine Assembly>REMOVAL.](#)
2. Check the oil path of the chain cover.  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSPECTION.](#)


Note:

Check the O-rings in the following oil path and also check that no foreign matter exists.

- Inlet of oil pump
- Outlet of oil pump
- Each O-ring in the path leading to left/right cylinder head
- Oil control solenoid
- Foreign matter exists


Is the check result OK?


Yes

 [Go to 13.](#)


No

Replace faulty parts. If there is any foreign matter, replace the chain cover.

 [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover.](#)

 [Go to 13.](#)

13. CHECK THE CAMSHAFT CONDITION.

1. Remove the timing chain.  [Ref. to MECHANICAL\(H4DOTC\)>Timing Chain Assembly>REMOVAL.](#)
2. Rotate the camshaft by hand to compare the rotational resistance of the four.


Note:

Check the following items if there is a clearly faulty condition in the camshaft (bank 1) such as restriction or rotational resistance by comparing it with the rotational resistance of the camshaft (bank 2).




- Foreign matter attached to camshaft
- Damage of camshaft (scratching, galling, wear, etc.)
- Check for consequence from improper rotation of cam journal bearing

Is the check result OK?

Yes

 [Go to 14.](#)

No

Replace the cam carrier and camshaft.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier.](#)  [Ref. to MECHANICAL\(H4DOTC\)>Camshaft.](#)
 [Go to 14.](#)


14. CHECK OIL PASSAGE FROM OIL PUMP TO OIL CONTROL SOLENOID.



Visually check the following parts of the oil passage from the oil pump to the oil control solenoid to check obvious defectiveness such as foreign matter, clogging, etc.

- Oil passage in cam Carrier
- Oil passage on cylinder head side
- Oil passage at the joint between cam sprocket and camshaft
- Oil passage at the back of sprocket and the end of camshaft when the sprocket is removed

Note:



Refer to removal procedure of cam carrier in service manual.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>REMOVAL.](#)


Is the check result OK?

Yes


Replace the sprocket.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Sprocket.](#)

Caution:


- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.**  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>ASSEMBLY.](#)


 [Go to 15.](#)

No



Remove the foreign matter. Replace the cam carrier oil filter (reuse not allowed).  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier.](#)


Caution:

- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.**  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)


- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>ASSEMBLY.](#)

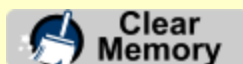
Note:


After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)

 [Go to 15.](#)

15. CHECK CURRENT DATA (LEARNING VALUE ERROR).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)



3. Using the Subaru Select Monitor, read the data monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
4. Read the current value of [VVT Ex Initial Position Learning Value #1].
5. Find the sum value of read [VVT Ex Initial Position Learning Value #1] and [Exh. VVT Retard Ang. R] recorded in step 3.

Is the sum value within standard?


Standard:

73 – 104

Yes

ECM is good; finish the diagnosis.

No

Replace the ECM and perform drive cycle N. When DTC is not displayed, end the diagnosis.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

1. OUTLINE OF DIAGNOSIS

Detect the exhaust AVCS system malfunction.

Judge as NG when standard timing advance amount is far from learning angle.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V

Elapsed time after external load (power steering, neutral position switch) change	≥ 3 s
Exhaust AVCS position learning	In operation
Actual timing advance change amount (for 10 ms)	$< 1^{\circ}\text{CA}$

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously while the exhaust AVCS is not operating after warming up.

4. DIAGNOSTIC METHOD

Judge as NG when the absolute value of the difference between cam signal input position and learning value is out of specification.

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Diagnosis 1

Judgment value

Malfunction Criteria	Threshold Value
Crankshaft position when camshaft position sensor signal is input – Learning value	$> 10^{\circ}\text{CA}$

Diagnosis 2

Judgment value

Malfunction Criteria	Threshold Value
Camshaft position sensor signal input position (bank 1)	$< 82.5^{\circ}\text{CA}$ or $> 140.5^{\circ}\text{CA}$
Camshaft position sensor signal input position (bank 2)	$< 80.7^{\circ}\text{CA}$ or $> 139.6^{\circ}\text{CA}$

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

Note:

Initial standard learning value is the value of crank angle initially input at the production plant. And then it will be updated every time normal judgment has been completed. Learning value will not be updated if NG judgment occurs because timing belt or chain derails suddenly in process or because wrong assembly occurs during servicing.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0018 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR A



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

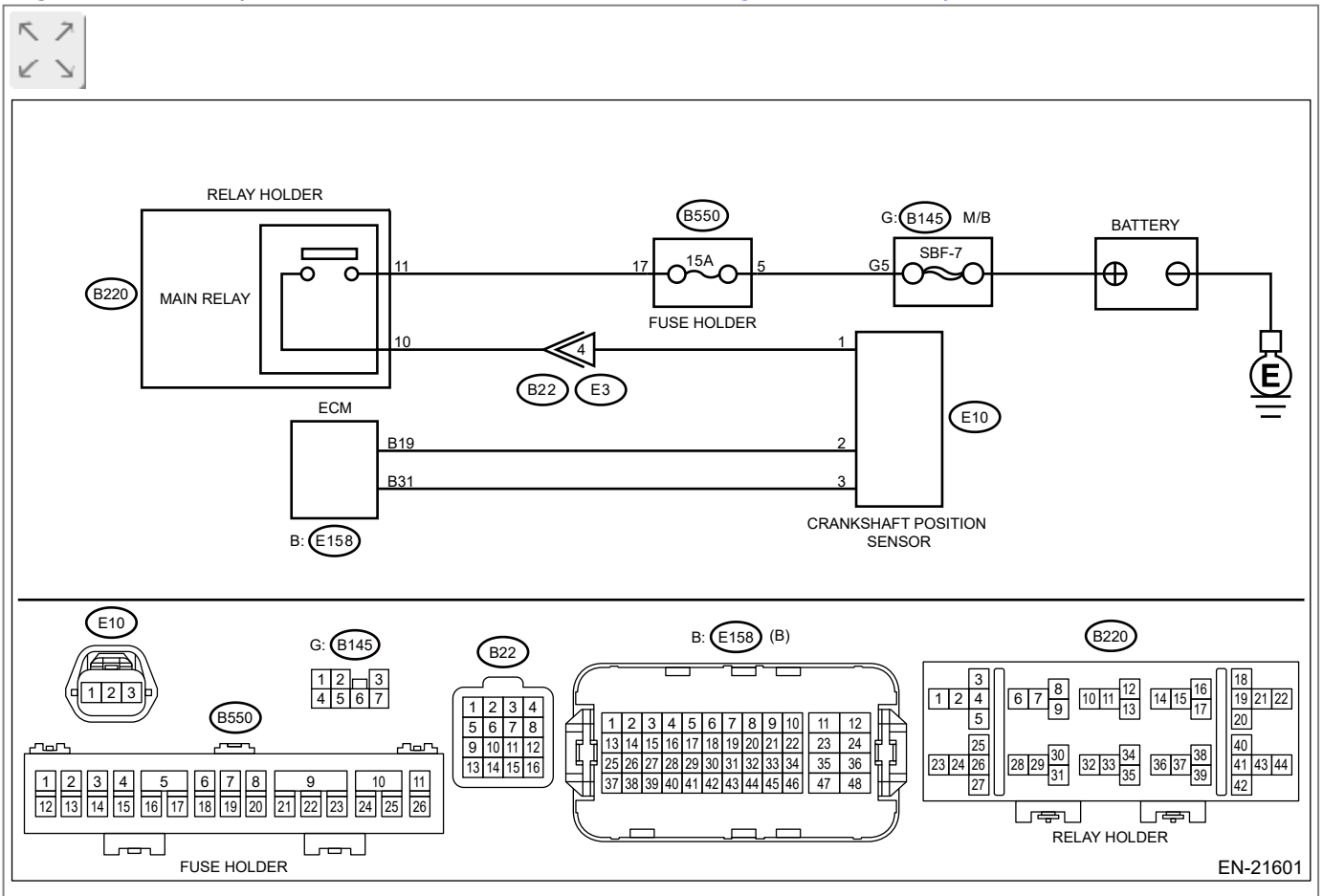
- Engine stalls.
- Improper idling

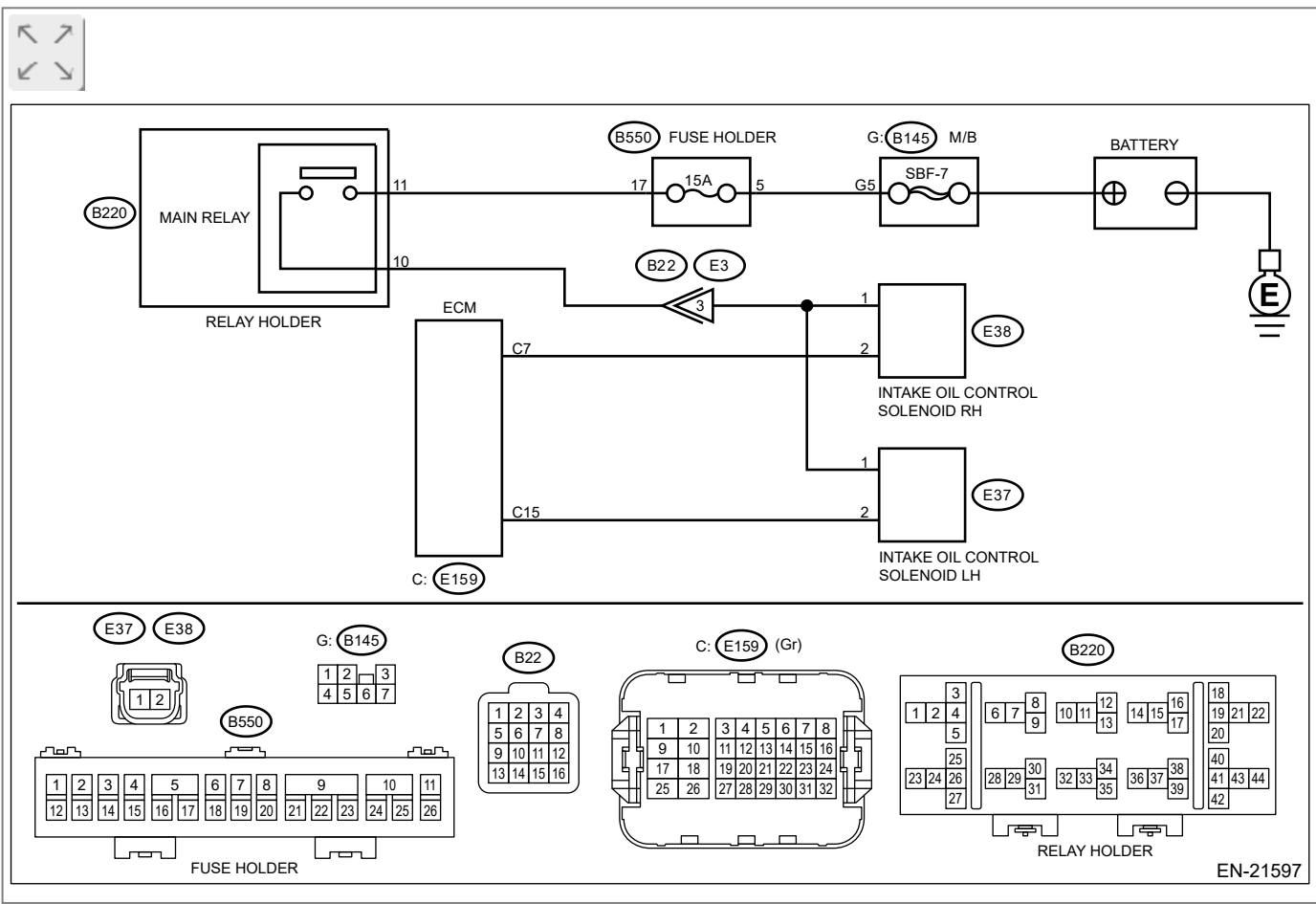
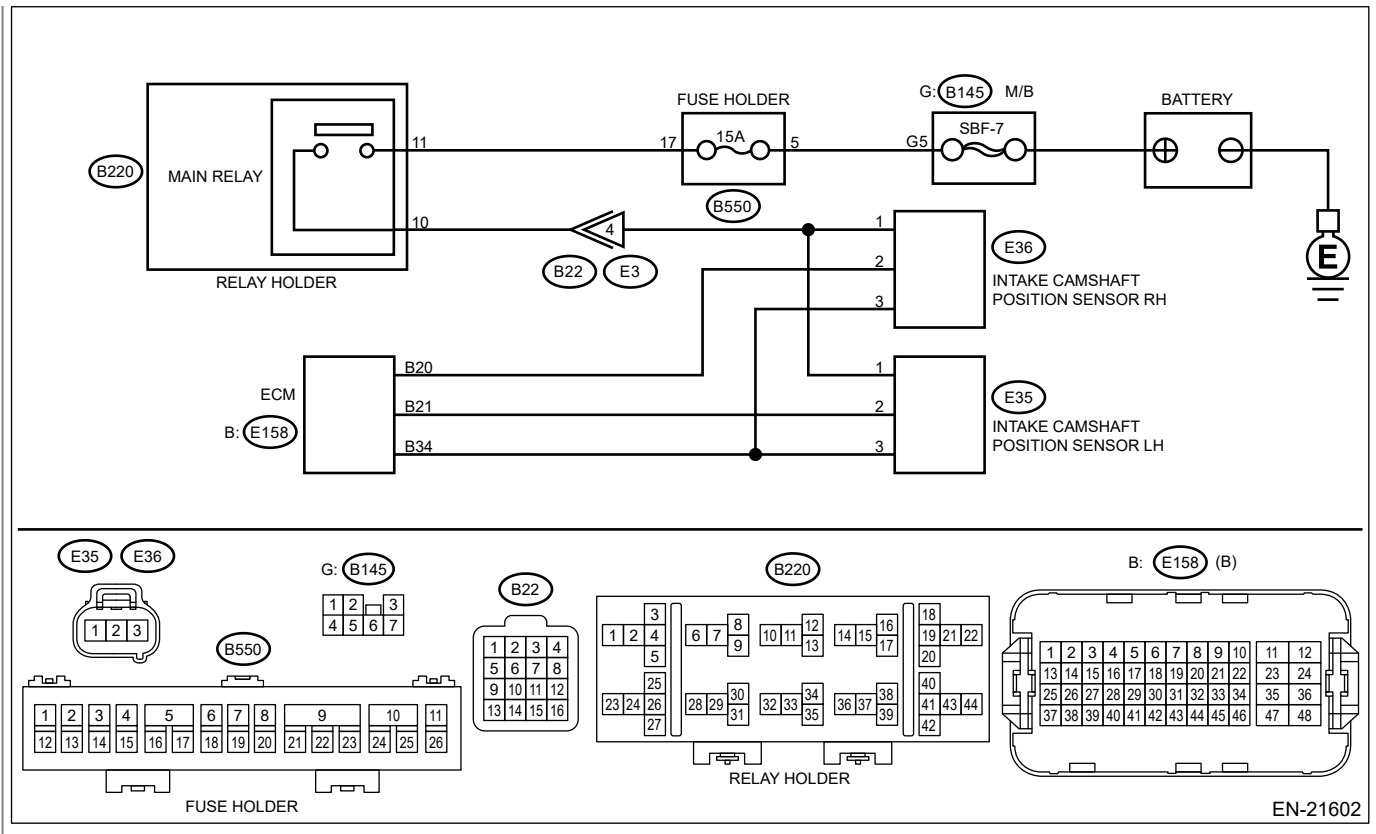
Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..


WIRING DIAGRAM:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.






1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)



DTC Check

Is DTC other than P0018 displayed? (Current malfunction)

Yes

Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)

No

Save the freeze frame data.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)  [Go to 2.](#)

2. CHECK ENGINE OIL CONDITION.

Check the engine oil condition.

Note:

Check the following items.




- **Within the specified range in amount**
- **Excessively dirty**
- **Coagulated by additives**
- **Use of oil of specified viscosity**

Is the check result OK?


Yes

 [Go to 3.](#)

No

Adjust the oil amount, or replace the engine oil and engine oil filter.  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)  [Go to 3.](#)

3. CHECK TIMING CHAIN.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)



2. Turn the ignition switch to OFF.
3. Disconnect the connector of the intake oil control solenoid LH. (DTC will be set but this will not affect the inspection)
4. Turn the ignition switch to ON.
5. Start monitoring [VVT Adv. Ang. Amount L] on the data monitor.
6. Start the engine.
7. Read [VVT Adv. Ang. Amount L] within 10 seconds after engine is started.

Note:

The display will indicate [0] by judging the position as standard after 10 seconds elapse since the engine was started.

8. Record the readings [VVT Adv. Ang. Amount L].
9. Stop the engine.

Is [VVT Adv. Ang. Amount L] out of standard (0 deg) by ± 10 deg or more within 10 seconds after starting?

Yes

Repair the timing chain. [Ref. to MECHANICAL\(H4DOTC\)>Timing Chain Assembly.](#)

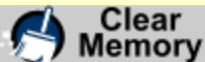
[Go to 15.](#)

No

[Go to 4.](#)

4. CHECK ON-BOARD MONITOR TEST RESULT.

1. Replace the intake oil control solenoid LH. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)



3. Perform drive cycle T. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Drive Cycle.](#)
4. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE\$06. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>General Scan Tool.](#)

Caution:

- **When performing driving cycle, there should be 2 persons (driver and checker) and the checker should perform the data check.**
- **When performing the drive cycle on the public road, be very careful of the traffic condition and the safe driving must be the high priority.**


Note:

- When the diagnostic value is 0, the diagnosis is incomplete. Therefore, do not stop the engine and perform the drive cycle again.
- Keep on checking the data during drive cycle because the diagnostic value is repeatedly updated.

5. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 2] of the replaced oil control solenoid 1000 or more?

Yes

 [Go to 6.](#)

No


 [Go to 5.](#)

5. CHECK ON-BOARD MONITOR TEST RESULT.




Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 4.

Is the value of [VVT monitor bank 2] 1000 or less, and more than (value of [VVT monitor bank 1] $\times 1.5 + 100$) compared with the value of [VVT monitor bank 1]?

Yes

 [Go to 6.](#)

No





Idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)
 [Go to 15.](#)

6. CHECK HARNESS AND CONNECTOR.

Check for a bend, damage and poor contact of harness and connector.

Note:

Check the following items.






- ECM  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)
- Oil control solenoid  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Oil Control Solenoid>INSPECTION.](#)
- Camshaft position sensor  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Camshaft Position Sensor>INSPECTION.](#)
- Crankshaft position sensor  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor Plate>INSPECTION.](#)

Is the check result OK?

 [Go to 7.](#)

Yes

No

Repair or replace faulty parts.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\)>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Camshaft Position Sensor.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor Plate.](#)
 [Go to 7.](#)

7. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the intake oil control solenoid LH.
4. Measure the resistance between intake oil control solenoid LH connector and ECM connector.

Connector & terminal


(E159) No. 15 — (E37) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 8.](#)

No

Repair or replace faulty parts.
 [Go to 15.](#)

8. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from intake camshaft position sensor LH.
4. Measure the resistance between the intake camshaft position sensor LH connector and ECM connector.

Connector & terminal

(E158) No. 21 — (E35) No. 2:


Is the resistance less than 1 Ω ?

Yes

 [Go to 9.](#)

No

Repair or replace faulty parts.

 [Go to 15.](#)

9. CHECK HARNESS AND CONNECTOR (OPEN).


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the crankshaft position sensor.
4. Measure the resistance between the crankshaft position sensor connector and ECM connector.

Connector & terminal

(E158) No. 19 – (E10) No. 2:


Is the resistance less than 1 Ω ?

Yes


 [Go to 10.](#)

No

Repair or replace faulty parts.

 [Go to 15.](#)

10. CHECK ENGINE OIL PRESSURE.

Check the engine oil pressure.  [Ref. to MECHANICAL\(H4DOTC\)>Engine Oil Pressure>INSPECTION.](#)

Is the oil pressure of engine oil normal?

Yes

 [Go to 12.](#)

No

 [Go to 11.](#)


11. CHECK OIL STRAINER.

Check the oil strainer.  [Ref. to LUBRICATION\(H4DO\)>Oil Pan>INSPECTION.](#)

Does any foreign matter exist at the oil strainer in the oil pan?

Yes


Check and clean inside the oil strainer.


 [Go to 12.](#)

No



Replace the chain cover.  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover.](#)

Caution:

Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.  Ref. to [MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)

 [Go to 13.](#)

12. CHECK OIL PATH OF CHAIN COVER.

1. Remove the engine from the vehicle.  [Ref. to MECHANICAL\(H4DOTC\)>Engine Assembly>REMOVAL.](#)
2. Check the oil path of the chain cover.  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSPECTION.](#)


Note:

Check the O-rings in the following oil path and also check that no foreign matter exists.

- Inlet of oil pump
- Outlet of oil pump
- Each O-ring in the path leading to left/right cylinder head
- Oil control solenoid
- Foreign matter exists


Is the check result OK?


Yes

 [Go to 13.](#)


No

Replace faulty parts. If there is any foreign matter, replace the chain cover.

 [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover.](#)

 [Go to 13.](#)

13. CHECK THE CAMSHAFT CONDITION.

1. Remove the timing chain.  [Ref. to MECHANICAL\(H4DOTC\)>Timing Chain Assembly>REMOVAL.](#)
2. Rotate the camshaft by hand to compare the rotational resistance of the four.


Note:

Check the following items if there is a clearly faulty condition in the camshaft (bank 2) such as restriction or rotational resistance by comparing it with the rotational resistance of the camshaft (bank 1).




- Foreign matter attached to camshaft
- Damage of camshaft (scratching, galling, wear, etc.)
- Check for consequence from improper rotation of cam journal bearing

Is the check result OK?

Yes

 [Go to 14.](#)

No

Replace the cam carrier and camshaft.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier.](#)  [Ref. to MECHANICAL\(H4DOTC\)>Camshaft.](#)
 [Go to 14.](#)


14. CHECK OIL PASSAGE FROM OIL PUMP TO OIL CONTROL SOLENOID.



Visually check the following parts of the oil passage from the oil pump to the oil control solenoid to check obvious defectiveness such as foreign matter, clogging, etc.

- Oil passage in cam Carrier
- Oil passage on cylinder head side
- Oil passage at the joint between cam sprocket and camshaft
- Oil passage at the back of sprocket and the end of camshaft when the sprocket is removed

Note:



[Refer to removal procedure of cam carrier in service manual.](#)  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>REMOVAL.](#)


Is the check result OK?

Yes


Replace the sprocket.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Sprocket.](#)

Caution:


- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.**  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>ASSEMBLY.](#)


 [Go to 15.](#)

No



Remove the foreign matter. Replace the cam carrier oil filter (reuse not allowed).  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier.](#)


Caution:

- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.**  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)


- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>ASSEMBLY.](#)

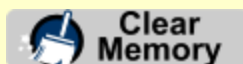
Note:


After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)

 [Go to 15.](#)

15. CHECK CURRENT DATA (LEARNING VALUE ERROR).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)



3. Using the Subaru Select Monitor, read the data monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
4. Read the current value of [VVT Initial Position Learning Value #2].
5. Find the sum value of read [VVT Initial Position Learning Value #2] and [VVT Adv. Ang. Amount L] recorded in step 3.

Is the sum value within standard?


Standard:

45 — 74

Yes


ECM is good; finish the diagnosis.

No

Replace the ECM and perform drive cycle N. When DTC is not displayed, end the diagnosis.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0016.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0016 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR A.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0019 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR B



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

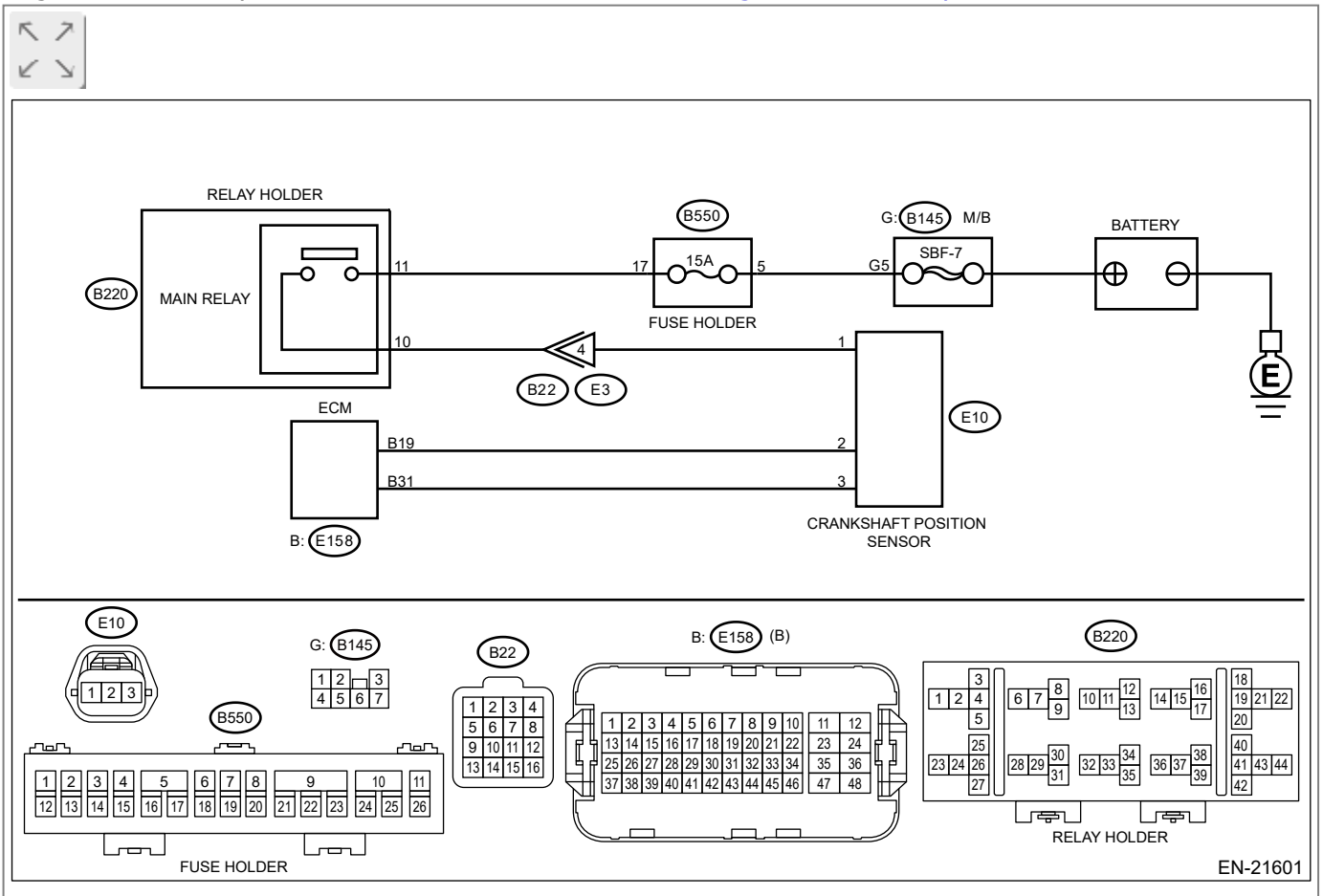
- Engine stalls.
- Improper idling

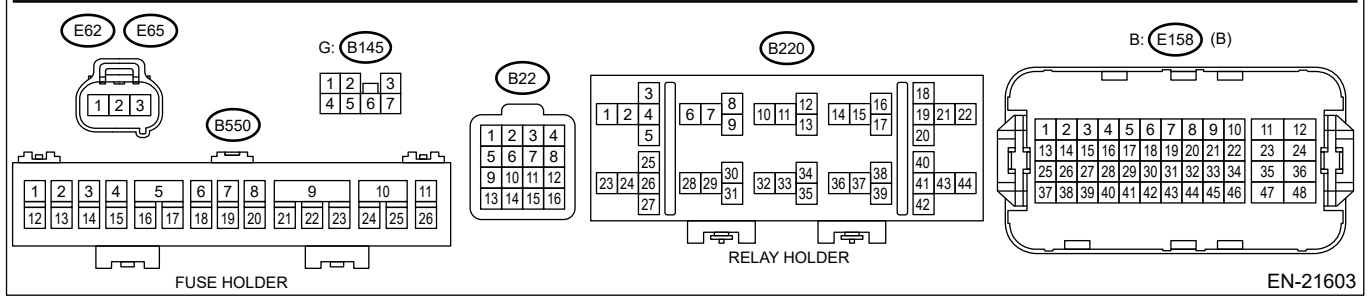
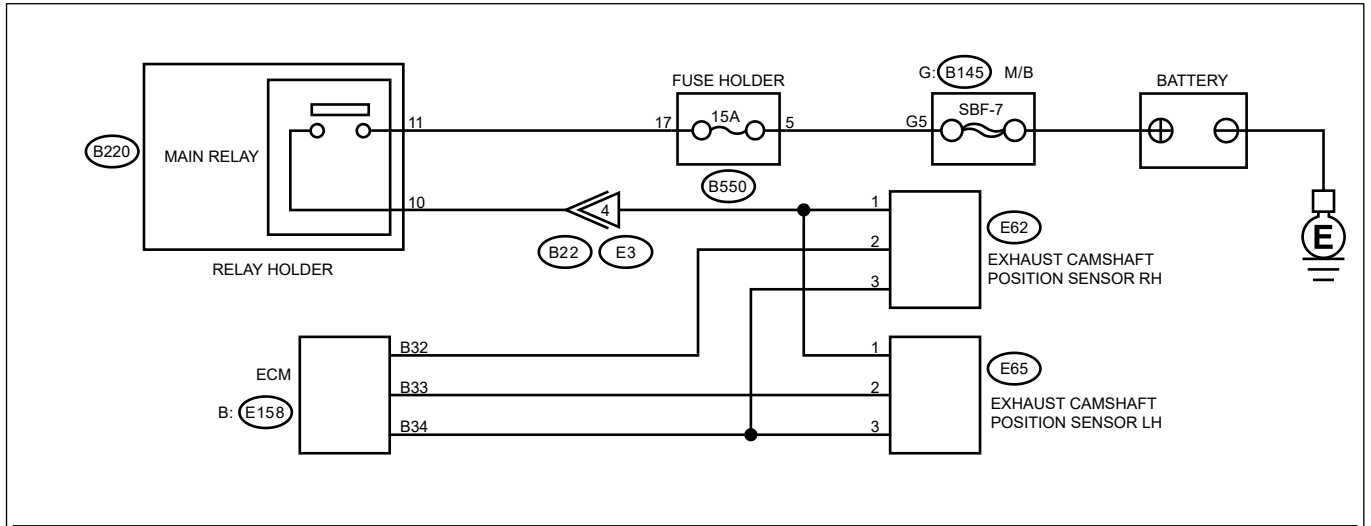
Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

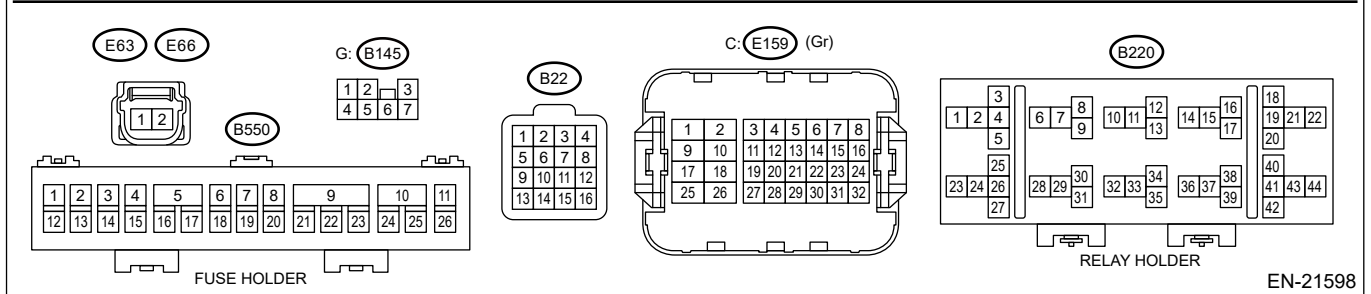
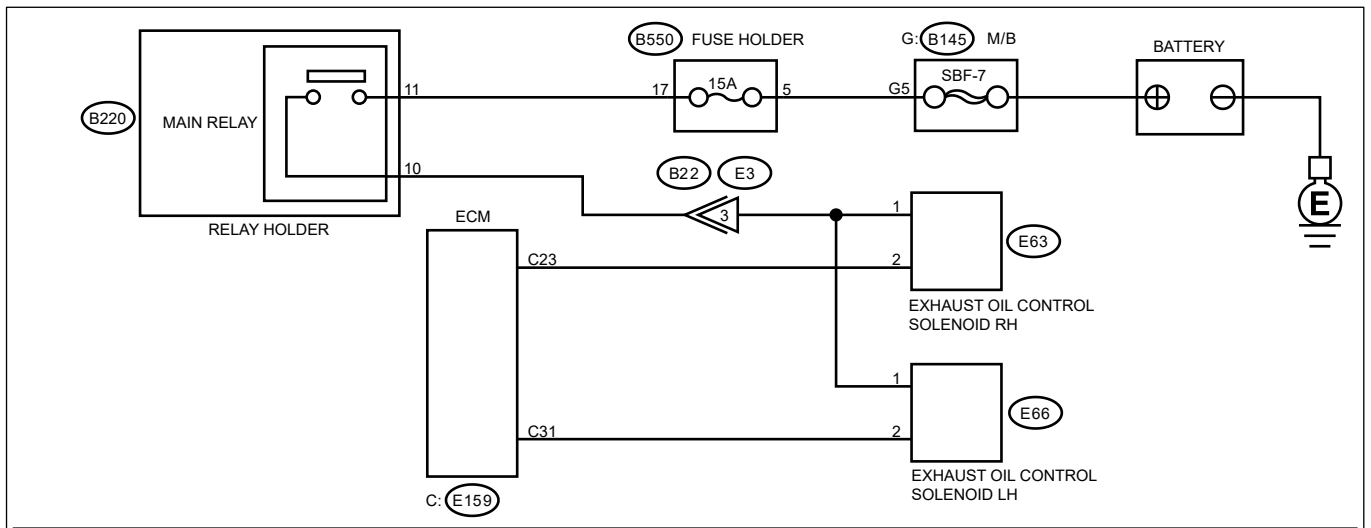
WIRING DIAGRAM:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.






EN-21603



EN-21598


1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)



DTC Check

Is DTC other than P0019 displayed? (Current malfunction)

Yes

Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)

No

Save the freeze frame data.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)  [Go to 2.](#)

2. CHECK ENGINE OIL CONDITION.

Check the engine oil condition.

Note:

Check the following items.




- **Within the specified range in amount**
- **Excessively dirty**
- **Coagulated by additives**
- **Use of oil of specified viscosity**

Is the check result OK?


Yes

 [Go to 3.](#)

No

Adjust the oil amount, or replace the engine oil and engine oil filter.  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)  [Go to 3.](#)

3. CHECK TIMING CHAIN.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)



2. Turn the ignition switch to OFF.
3. Disconnect the connector of the exhaust oil control solenoid LH. (DTC will be set but this will not affect the inspection)
4. Turn the ignition switch to ON.
5. Start monitoring [Exh. VVT Retard Ang. L] on the data monitor.
6. Start the engine.
7. Read [Exh. VVT Retard Ang. L] within 10 seconds after engine is started.

Note:

The display will indicate [0] by judging the position as standard after 10 seconds elapse since the engine was started.

8. Record the readings [Exh. VVT Retard Ang. L].
9. Stop the engine.

Is [Exh. VVT Retard Ang. L] out of standard (0 deg) by ± 10 deg or more within 10 seconds after starting?

Yes

Repair the timing chain. [Ref. to MECHANICAL\(H4DOTC\)>Timing Chain Assembly.](#)

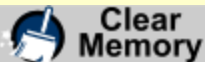
[Go to 15.](#)

No

[Go to 4.](#)

4. CHECK ON-BOARD MONITOR TEST RESULT.

1. Replace the exhaust oil control solenoid LH. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)



3. Perform drive cycle T. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Drive Cycle.](#)
4. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE\$06. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>General Scan Tool.](#)

Caution:

- **When performing driving cycle, there should be 2 persons (driver and checker) and the checker should perform the data check.**
- **When performing the drive cycle on the public road, be very careful of the traffic condition and the safe driving must be the high priority.**


Note:

- When the diagnostic value is 0, the diagnosis is incomplete. Therefore, do not stop the engine and perform the drive cycle again.
- Keep on checking the data during drive cycle because the diagnostic value is repeatedly updated.


5. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 2] of the replaced oil control solenoid 1000 or more?

Yes

 [Go to 6.](#)

No

 [Go to 5.](#)

5. CHECK ON-BOARD MONITOR TEST RESULT.




Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 4.

Is the value of [VVT monitor bank 2] 1000 or less, and more than (value of [VVT monitor bank 1] $\times 1.5 + 100$) compared with the value of [VVT monitor bank 1]?

Yes

 [Go to 6.](#)

No





Idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)
 [Go to 15.](#)

6. CHECK HARNESS AND CONNECTOR.

Check for a bend, damage and poor contact of harness and connector.

Note:

Check the following items.






- ECM  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)
- Oil control solenoid  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Oil Control Solenoid>INSPECTION.](#)
- Camshaft position sensor  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Camshaft Position Sensor>INSPECTION.](#)
- Crankshaft position sensor  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor Plate>INSPECTION.](#)

Is the check result OK?

 [Go to 7.](#)

Yes

No

Repair or replace faulty parts.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\)>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Camshaft Position Sensor.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor Plate.](#)
 [Go to 7.](#)

7. CHECK HARNESS AND CONNECTOR (OPEN).



1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the exhaust oil control solenoid LH.
4. Measure the resistance between exhaust oil control solenoid LH connector and ECM connector.

Connector & terminal


(E159) No. 31 — (E66) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 8.](#)

No

Repair or replace faulty parts.
 [Go to 15.](#)

8. CHECK HARNESS AND CONNECTOR (OPEN).



1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from exhaust camshaft position sensor LH.
4. Measure the resistance between the exhaust camshaft position sensor LH connector and ECM connector.

Connector & terminal

(E158) No. 33 — (E65) No. 2:


Is the resistance less than 1 Ω ?

Yes

 [Go to 9.](#)

No

Repair or replace faulty parts.

 [Go to 15.](#)

9. CHECK HARNESS AND CONNECTOR (OPEN).


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the crankshaft position sensor.
4. Measure the resistance between the crankshaft position sensor connector and ECM connector.

Connector & terminal

(E158) No. 19 – (E10) No. 2:


Is the resistance less than 1 Ω ?

Yes


 [Go to 10.](#)

No

Repair or replace faulty parts.

 [Go to 15.](#)

10. CHECK ENGINE OIL PRESSURE.

Check the engine oil pressure.  [Ref. to MECHANICAL\(H4DOTC\)>Engine Oil Pressure>INSPECTION.](#)

Is the oil pressure of engine oil normal?

Yes

 [Go to 12.](#)

No

 [Go to 11.](#)


11. CHECK OIL STRAINER.

Check the oil strainer.  [Ref. to LUBRICATION\(H4DO\)>Oil Pan>INSPECTION.](#)

Does any foreign matter exist at the oil strainer in the oil pan?

Yes


Check and clean inside the oil strainer.


 [Go to 12.](#)

No



Replace the chain cover.  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover.](#)

Caution:

Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.  Ref. to [MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)

 [Go to 13.](#)

12. CHECK OIL PATH OF CHAIN COVER.

1. Remove the engine from the vehicle.  [Ref. to MECHANICAL\(H4DOTC\)>Engine Assembly>REMOVAL.](#)
2. Check the oil path of the chain cover.  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSPECTION.](#)


Note:

Check the O-rings in the following oil path and also check that no foreign matter exists.

- Inlet of oil pump
- Outlet of oil pump
- Each O-ring in the path leading to left/right cylinder head
- Oil control solenoid
- Foreign matter exists


Is the check result OK?


Yes

 [Go to 13.](#)


No

Replace faulty parts. If there is any foreign matter, replace the chain cover.

 [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover.](#)

 [Go to 13.](#)

13. CHECK THE CAMSHAFT CONDITION.

1. Remove the timing chain.  [Ref. to MECHANICAL\(H4DOTC\)>Timing Chain Assembly>REMOVAL.](#)
2. Rotate the camshaft by hand to compare the rotational resistance of the four.


Note:

Check the following items if there is a clearly faulty condition in the camshaft (bank 2) such as restriction or rotational resistance by comparing it with the rotational resistance of the camshaft (bank 1).




- Foreign matter attached to camshaft
- Damage of camshaft (scratching, galling, wear, etc.)
- Check for consequence from improper rotation of cam journal bearing

Is the check result OK?

Yes

 [Go to 14.](#)

No

Replace the cam carrier and camshaft.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier.](#)  [Ref. to MECHANICAL\(H4DOTC\)>Camshaft.](#)
 [Go to 14.](#)


14. CHECK OIL PASSAGE FROM OIL PUMP TO OIL CONTROL SOLENOID.



Visually check the following parts of the oil passage from the oil pump to the oil control solenoid to check obvious defectiveness such as foreign matter, clogging, etc.

- Oil passage in cam Carrier
- Oil passage on cylinder head side
- Oil passage at the joint between cam sprocket and camshaft
- Oil passage at the back of sprocket and the end of camshaft when the sprocket is removed

Note:



Refer to removal procedure of cam carrier in service manual.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>REMOVAL.](#)


Is the check result OK?

Yes


Replace the sprocket.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Sprocket.](#)

Caution:


- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.**  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>ASSEMBLY.](#)


 [Go to 15.](#)

No



Remove the foreign matter. Replace the cam carrier oil filter (reuse not allowed).  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier.](#)


Caution:

- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.**  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)


- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>ASSEMBLY.](#)

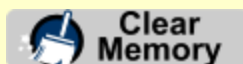
Note:


After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)

 [Go to 15.](#)

15. CHECK CURRENT DATA (LEARNING VALUE ERROR).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)



3. Using the Subaru Select Monitor, read the data monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
4. Read the current value of [VVT Ex Initial Position Learning Value #2].
5. Find the sum value of read [VVT Ex Initial Position Learning Value #2] and [Exh. VVT Retard Ang. L] recorded in step 3.

Is the sum value within standard?


Standard:

73 – 104

Yes

ECM is good; finish the diagnosis.

No

Replace the ECM and perform drive cycle N. When DTC is not displayed, end the diagnosis.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0017.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0017 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR B.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0020 "A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

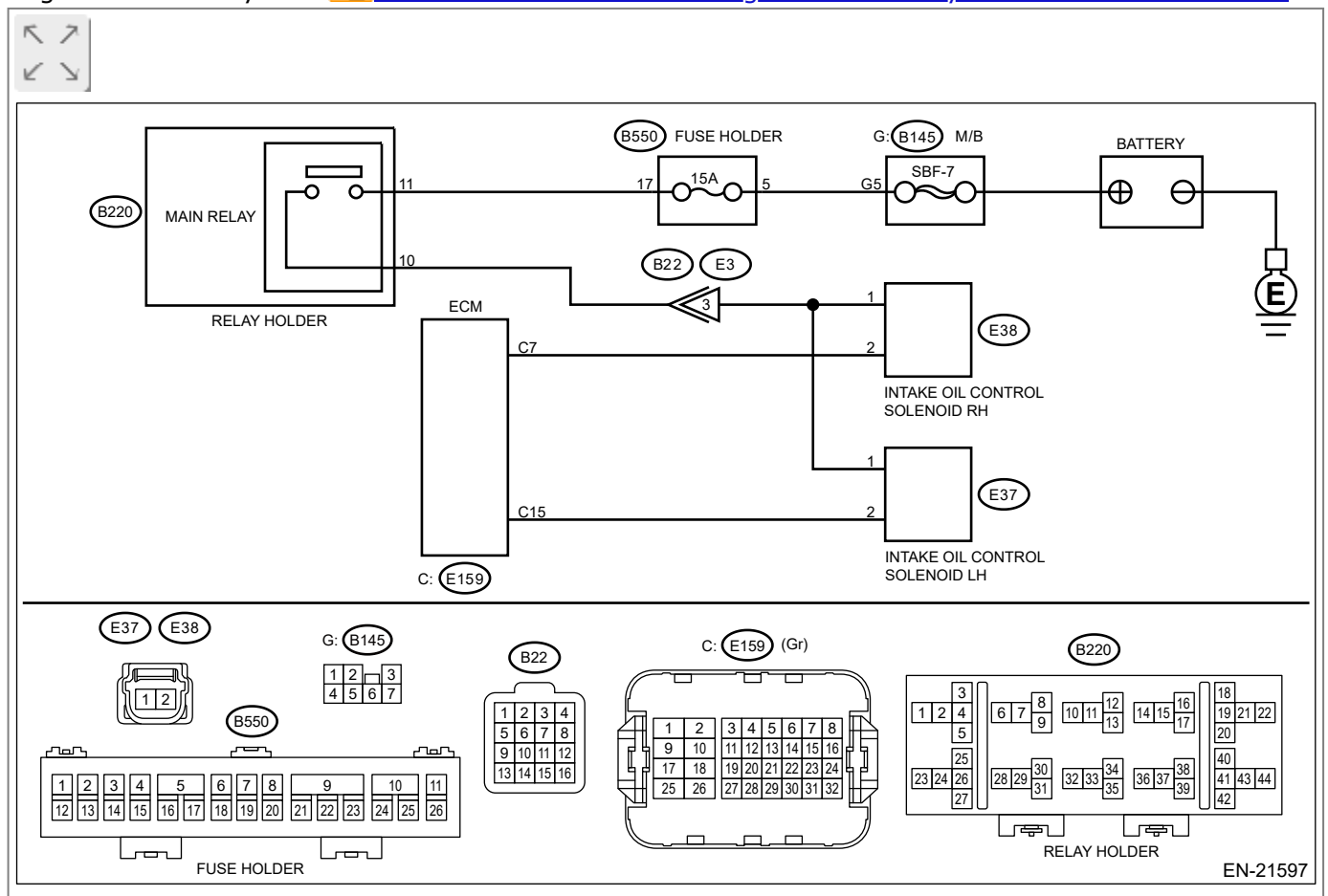
Improper idling

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK OUTPUT SIGNAL OF ECM.


1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and engine ground.

Connector & terminal


(E159) No. 15 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

 [Go to 3.](#)

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes

Repair the poor contact of ECM connector.

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

3. CHECK POWER SUPPLY TO THE INTAKE OIL CONTROL SOLENOID LH.

Measure the voltage between intake oil control solenoid LH connector and engine ground.

Connector & terminal

(E37) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

Repair the power supply circuit.

4. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake oil control solenoid LH.


3. Disconnect the connector from ECM.
4. Measure the resistance between intake oil control solenoid LH connector and engine ground.

Connector & terminal

(E37) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM and intake oil control solenoid LH connector.

5. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH CONNECTOR.

Measure the resistance of harness between ECM and intake oil control solenoid LH.

Connector & terminal

(E159) No. 15 — (E37) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 6.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and intake oil control solenoid LH connector**
- **Poor contact of coupling connector**

6. CHECK INTAKE OIL CONTROL SOLENOID LH.

Measure the resistance between intake oil control solenoid LH terminals.

Terminals


No. 1 — No. 2:

Is the resistance 6 — 12 Ω ?

Yes

Repair the poor contact of intake oil control solenoid LH connector.

No

Replace the intake oil control solenoid LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0010.  Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0010 "A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0021 "A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

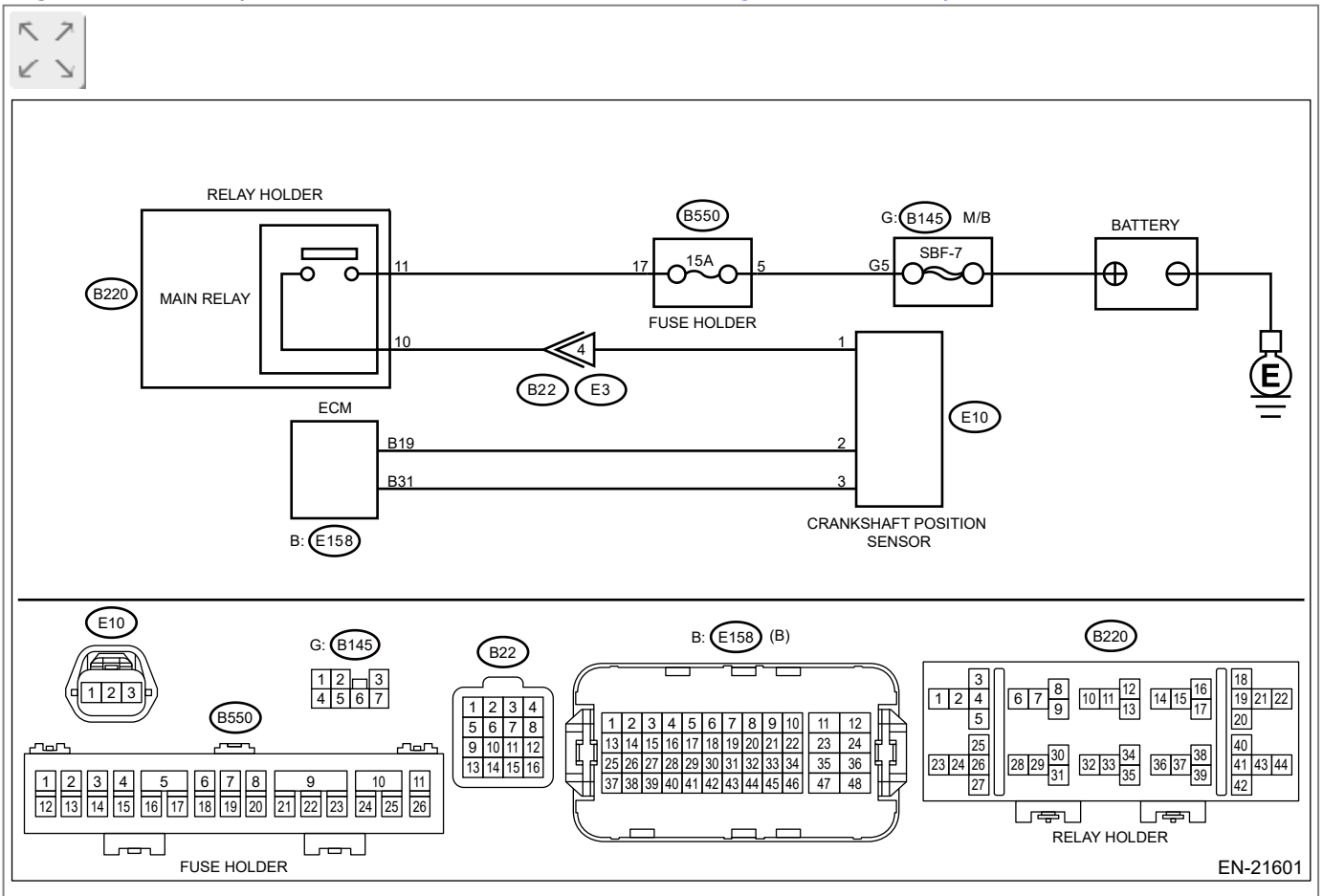
- Engine stalls.
- Improper idling

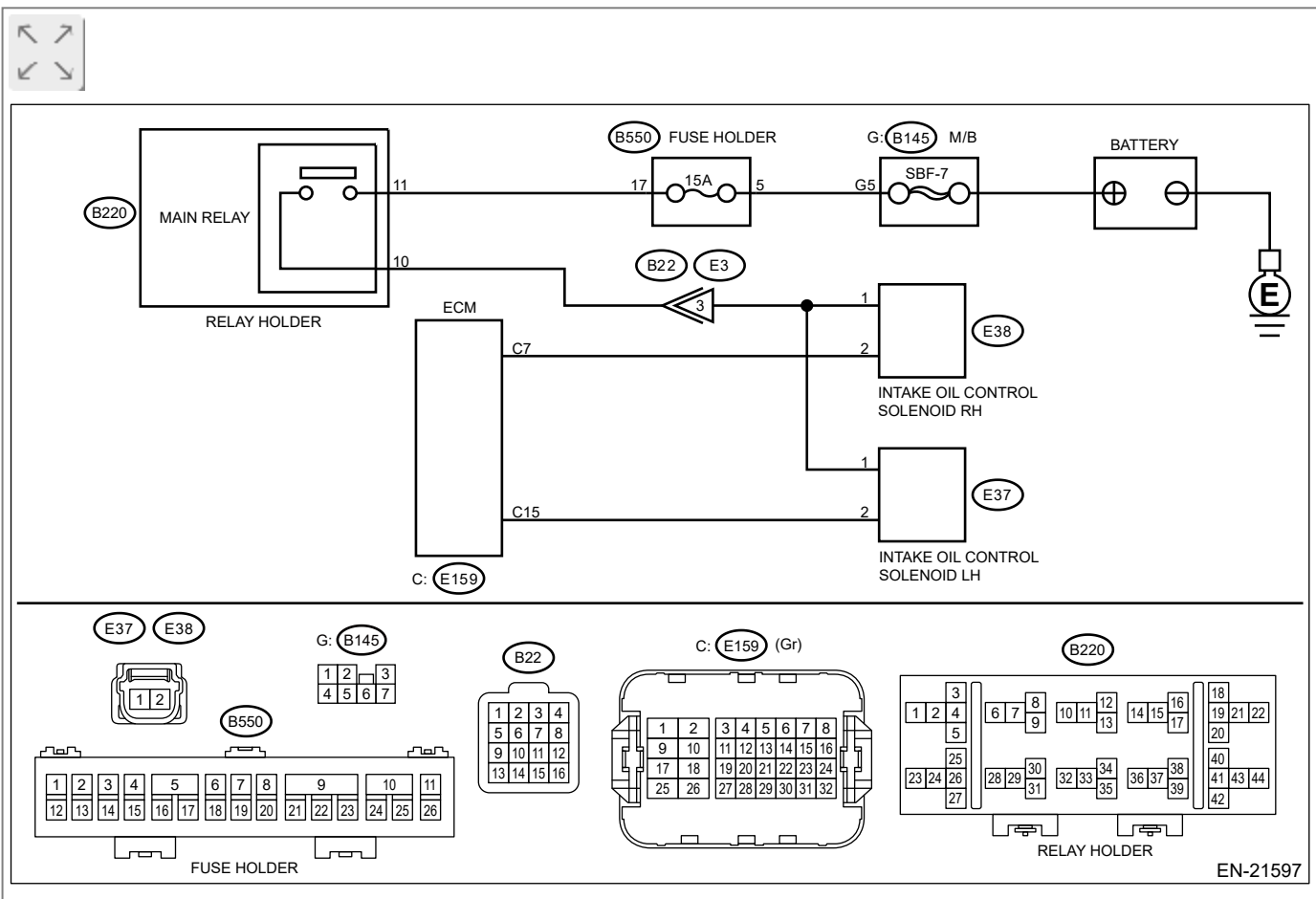
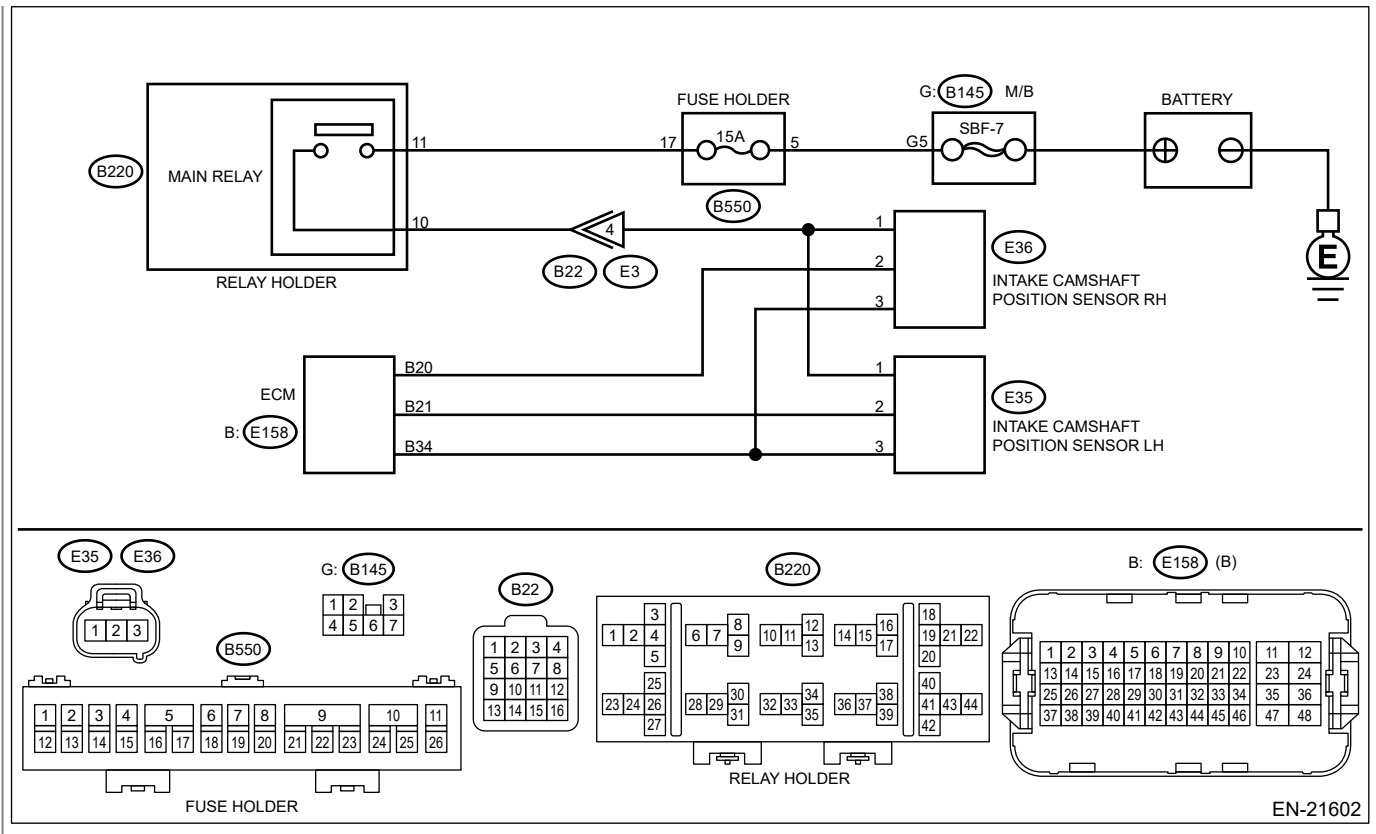
Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..


WIRING DIAGRAM:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.






1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)



DTC Check

Is DTC other than P000C and P0021 displayed? (Current malfunction)

Yes

Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)

No

Save the freeze frame data.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)
 [Go to 2.](#)

2. CHECK OUTPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and engine ground.

Connector & terminal

(E159) No. 15 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 3.](#)

No

 [Go to 4.](#)

3. CHECK FOR POOR CONTACT.

Check the ECM connector and harness.

Note:

Check the following items.

- Poor contact of ECM connector
- Temporary open or short circuit of harness
- Contamination, corrosion or looseness of engine ground terminal

Is the check result OK?

 [Go to 5.](#)

Yes

No

Repair or replace faulty parts.

4. CHECK POWER SUPPLY TO THE INTAKE OIL CONTROL SOLENOID LH.


Measure the voltage between intake oil control solenoid LH connector and engine ground.

Connector & terminal

(E37) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 5.](#)

No

Repair the power supply circuit.

5. CHECK ENGINE OIL CONDITION.

Check the engine oil condition.

Note:

Check the following items.




- **Within the specified range in amount**
- **Excessively dirty**
- **Coagulated by additives**
- **Use of oil of specified viscosity**

Is the check result OK?


Yes


 [Go to 6.](#)

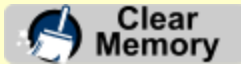
No



Adjust the oil amount, or replace the engine oil and engine oil filter.  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)
 [Go to 6.](#)

6. CHECK ON-BOARD MONITOR TEST RESULT.

1. Replace the intake oil control solenoid LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Oil Control Solenoid.](#)

2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)



3. Perform drive cycle T.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Drive Cycle.](#)
4. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE\$06.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>General Scan Tool.](#)

Caution:

- **When performing driving cycle, there should be 2 persons (driver and checker) and the checker should perform the data check.**
- **When performing the drive cycle on the public road, be very careful of the traffic condition and the safe driving must be the high priority.**

Note:

- **When the diagnostic value is 0, the diagnosis is incomplete. Therefore, do not stop the engine and perform the drive cycle again.**
- **Always keep on checking the data while reading out the diagnostic value because the diagnostic value is repeatedly updated.**

5. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 2] of the replaced oil control solenoid 1000 or more?

Yes

 [Go to 8.](#)

No

 [Go to 7.](#)

7. CHECK ON-BOARD MONITOR TEST RESULT.




Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 6.

Is the value of [VVT monitor bank 2] 1000 or less, and more than (value of [VVT monitor bank 1] $\times 1.5 + 100$) compared with the value of [VVT monitor bank 1]?

Yes

 [Go to 8.](#)

No





Idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)
 [Go to 17.](#)

8. CHECK HARNESS AND CONNECTOR.

Check for a bend, damage and poor contact of harness and connector.

Note:

Check the following items.





- **ECM**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)
- **Oil control solenoid**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Oil Control Solenoid>INSPECTION.](#)
- **Camshaft position sensor**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Camshaft Position Sensor>INSPECTION.](#)
- **Crankshaft position sensor**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor Plate>INSPECTION.](#)

Is the check result OK?

Yes

 [Go to 9.](#)

No

Repair or replace faulty parts.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\)>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Camshaft Position Sensor.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor Plate.](#)

 [Go to 9.](#)

9. CHECK HARNESS AND CONNECTOR (OPEN).


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the intake oil control solenoid LH.
4. Measure the resistance between intake oil control solenoid LH connector and ECM connector.

Connector & terminal

(E159) No. 15 — (E37) No. 2:


Is the resistance less than 1 Ω?

Yes

 [Go to 10.](#)

No

Repair or replace faulty parts.

 [Go to 17.](#)

10. CHECK HARNESS AND CONNECTOR (OPEN).


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from intake camshaft position sensor LH.
4. Measure the resistance between the intake camshaft position sensor LH connector and ECM connector.

Connector & terminal

(E158) No. 21 — (E35) No. 2:


Is the resistance less than 1 Ω ?

Yes

 [Go to 11.](#)

No

Repair or replace faulty parts.

 [Go to 17.](#)

11. CHECK HARNESS AND CONNECTOR (OPEN).




1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the crankshaft position sensor.
4. Measure the resistance between the crankshaft position sensor connector and ECM connector.

Connector & terminal

(E158) No. 19 — (E10) No. 2:


Is the resistance less than 1 Ω ?

Yes

 [Go to 12.](#)


No

Repair or replace faulty parts.

 [Go to 17.](#)


12. CHECK ENGINE OIL PRESSURE.




Check the engine oil pressure.  [Ref. to MECHANICAL\(H4DOTC\)>Engine Oil Pressure>INSPECTION.](#)

Is the oil pressure of engine oil normal?

Yes

 [Go to 14.](#)

No

 [Go to 13.](#)

13. CHECK OIL STRAINER.



Check the oil strainer. [Ref. to LUBRICATION\(H4DO\)>Oil Pan>INSPECTION.](#)

Does any foreign matter exist at the oil strainer in the oil pan?

Yes

Check and clean inside the oil strainer.

[Go to 14.](#)

No

Replace the chain cover. [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover.](#)

Caution:

Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)

[Go to 15.](#)

14. CHECK OIL PATH OF CHAIN COVER.



1. Remove the engine from the vehicle. [Ref. to MECHANICAL\(H4DOTC\)>Engine Assembly>REMOVAL.](#)
2. Check the oil path of the chain cover. [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSPECTION.](#)

Note:

Check the O-rings in the following oil path and also check that no foreign matter exists.

- Inlet of oil pump
- Outlet of oil pump
- Each O-ring in the path leading to left/right cylinder head
- Oil control solenoid
- Foreign matter exists

Is the check result OK?

Yes

[Go to 15.](#)


No

Replace faulty parts. If there is any foreign matter, replace the chain cover.

[Ref. to MECHANICAL\(H4DOTC\)>Chain Cover.](#)

[Go to 15.](#)

15. CHECK THE CAMSHAFT CONDITION.

1. Remove the timing chain.  [Ref. to MECHANICAL\(H4DOTC\)>Timing Chain Assembly>REMOVAL.](#)
2. Rotate the camshaft by hand to compare the rotational resistance of the four.


Note:

Check the following items if there is a clearly faulty condition in the camshaft (bank 2) such as restriction or rotational resistance by comparing it with the rotational resistance of the camshaft (bank 1).




- Foreign matter attached to camshaft
- Damage of camshaft (scratching, galling, wear, etc.)
- Check for consequence from improper rotation of cam journal bearing

Is the check result OK?

Yes

 [Go to 16.](#)

No


Replace the cam carrier and camshaft.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier.](#)  [Ref. to MECHANICAL\(H4DOTC\)>Camshaft.](#)
 [Go to 16.](#)

16. CHECK OIL PASSAGE BETWEEN OIL PUMP AND OIL CONTROL SOLENOID.

Visually check the following parts of the oil passage from the oil pump to the oil control solenoid to check obvious defectiveness such as foreign matter, clogging, etc.

- Oil passage in cam Carrier
- Oil passage on cylinder head side
- Oil passage at the joint between cam sprocket and camshaft
- Oil passage at the back of sprocket and the end of camshaft when the sprocket is removed

Note:

Refer to removal procedure of cam carrier in service manual.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>REMOVAL.](#)


Is the check result OK?


Yes


Replace the sprocket.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Sprocket.](#)

Caution:


- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of**

application.  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)



- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>ASSEMBLY.](#)

 [Go to 17.](#)



No

Remove the foreign matter. Replace the cam carrier oil filter (reuse not allowed).  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier.](#)

Caution:


- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.**  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>ASSEMBLY.](#)

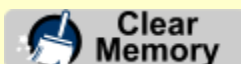
Note:



After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)

 [Go to 17.](#)

17. CHECK ON-BOARD MONITOR TEST RESULT.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)



2. Perform drive cycle T.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Drive Cycle.](#)
3. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE\$06.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>General Scan Tool.](#)

Caution:

- **When performing driving cycle, there should be 2 persons (driver and checker) and the checker should perform the data check.**
- **When performing the drive cycle on the public road, be very careful of the traffic condition and the safe driving must be the high priority.**

Note:


- **When the diagnostic value is 0, the diagnosis is incomplete. Therefore, do not stop the engine and perform the drive cycle again.**

- **Keep on checking the data during drive cycle because the diagnostic value is repeatedly updated.**


4. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 2] 1000 or more?

Yes

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

No


 [Go to 18.](#)

18. CHECK DTC.

Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 17.

Is the value of [VVT monitor bank 2] 1000 or less, and more than (value of [VVT monitor bank 1] $\times 1.5 + 100$) compared with the value of [VVT monitor bank 1]?

Yes


Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

No

End.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0011.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0011 "A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0023 "B" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

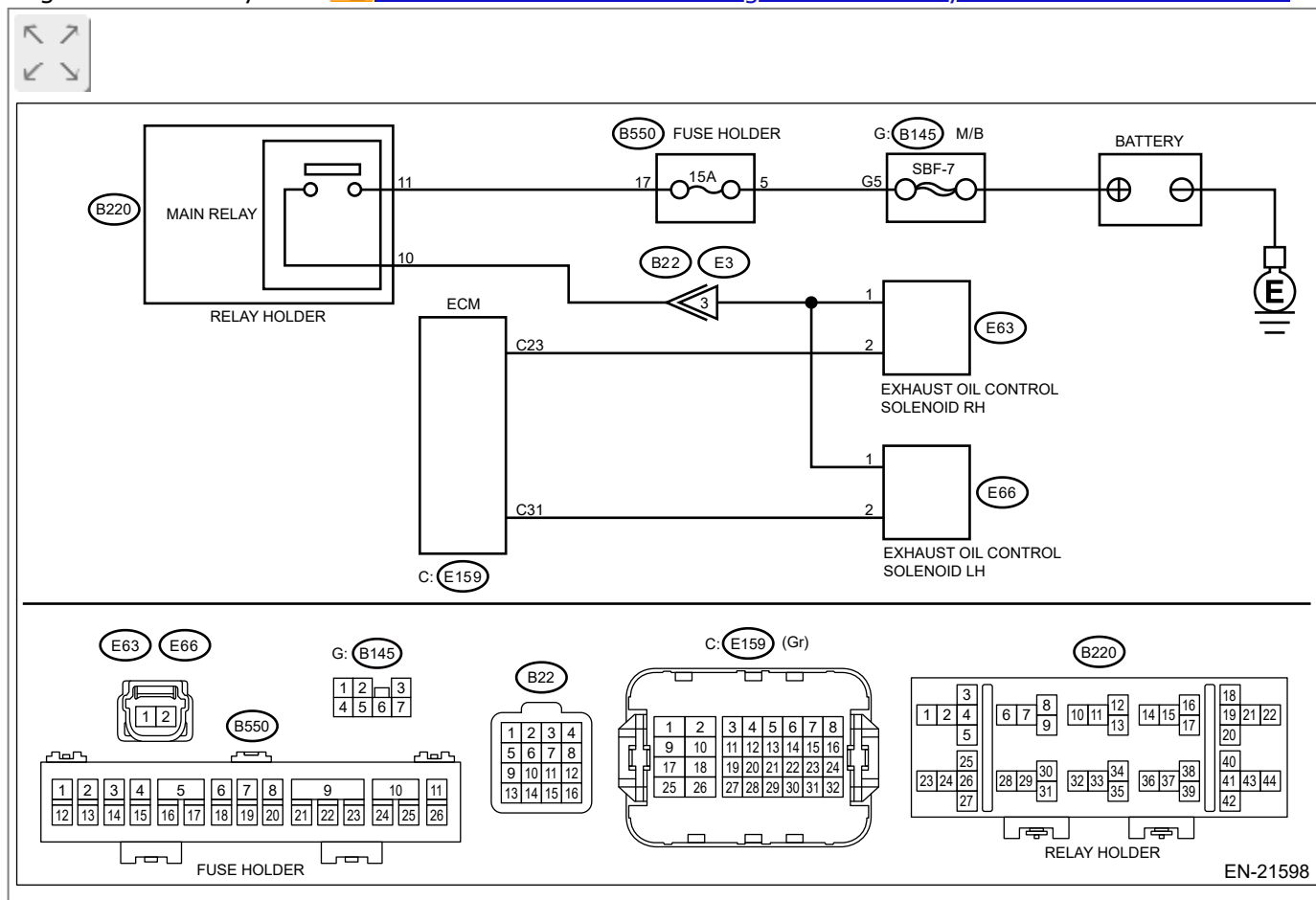
Improper idling

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK OUTPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and engine ground.


Connector & terminal




(E159) No. 31 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

 [Go to 3.](#)

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes

Repair the poor contact of ECM connector.

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

3. CHECK POWER SUPPLY TO THE EXHAUST OIL CONTROL SOLENOID LH.

Measure the voltage between exhaust oil control solenoid LH connector and engine ground.

Connector & terminal

(E66) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

Repair the power supply circuit.

4. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH CONNECTOR.

1. Turn the ignition switch to OFF.

2. Disconnect the connector from the exhaust oil control solenoid LH.

3. Disconnect the connector from ECM.


4. Measure the resistance between exhaust oil control solenoid LH connector and engine ground.

Connector & terminal

(E66) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM and exhaust oil control solenoid LH connector.

5. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH CONNECTOR.

Measure the resistance of harness between ECM and exhaust oil control solenoid LH.

Connector & terminal

(E159) No. 31 — (E66) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 6.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and exhaust oil control solenoid LH connector**
- **Poor contact of coupling connector**

6. CHECK EXHAUST OIL CONTROL SOLENOID LH.

Measure the resistance between exhaust oil control solenoid LH terminals.

Terminals


No. 1 — No. 2:

Is the resistance 6 — 12 Ω ?

Yes


Repair the poor contact of exhaust oil control solenoid LH connector.

No

Replace the exhaust oil control solenoid LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0013.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0013 "B" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0024 "B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

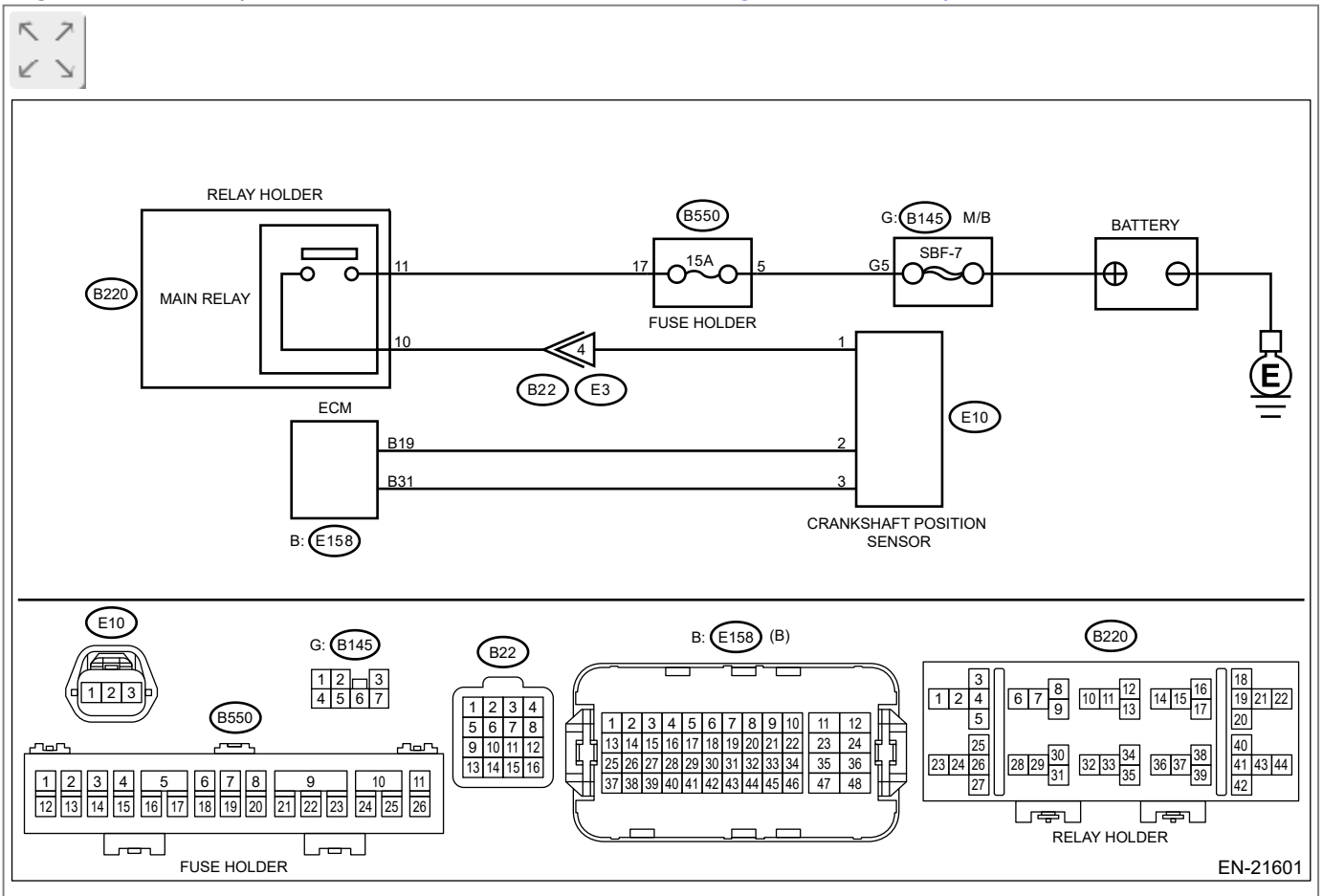
- Engine stalls.
- Improper idling

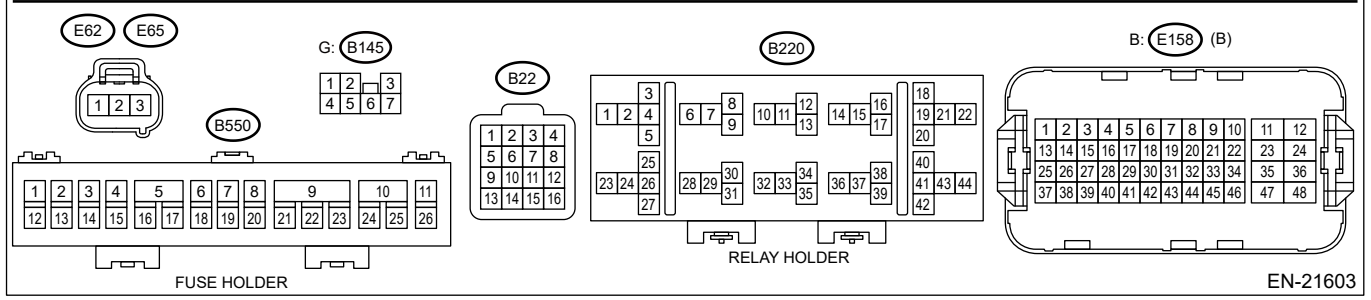
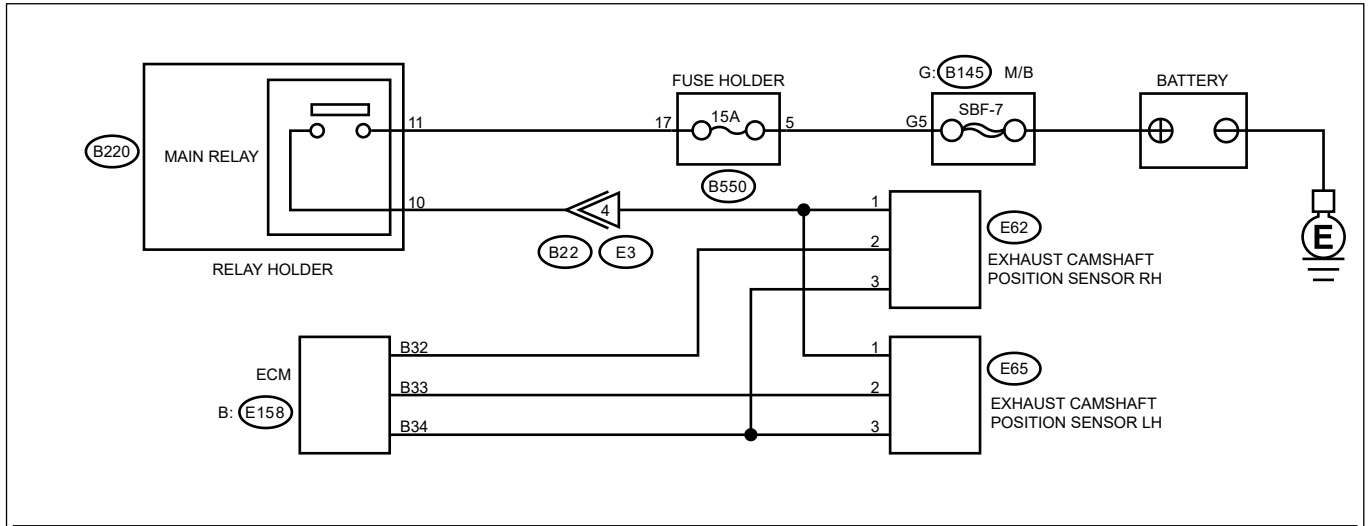
Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

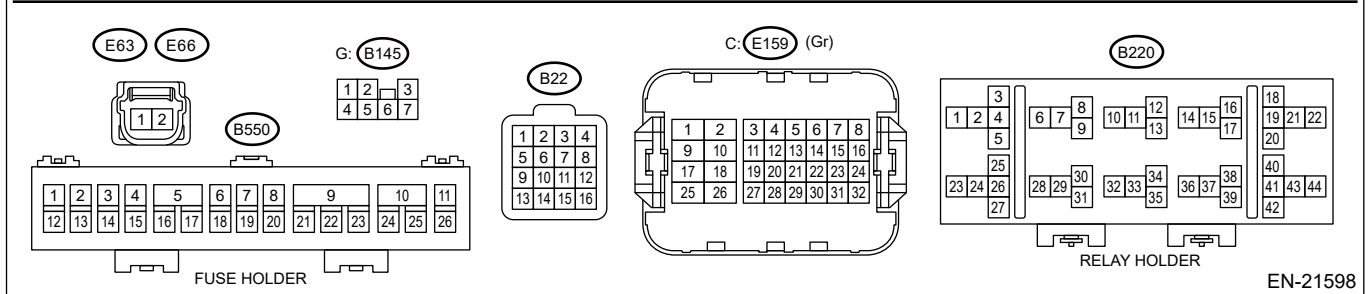
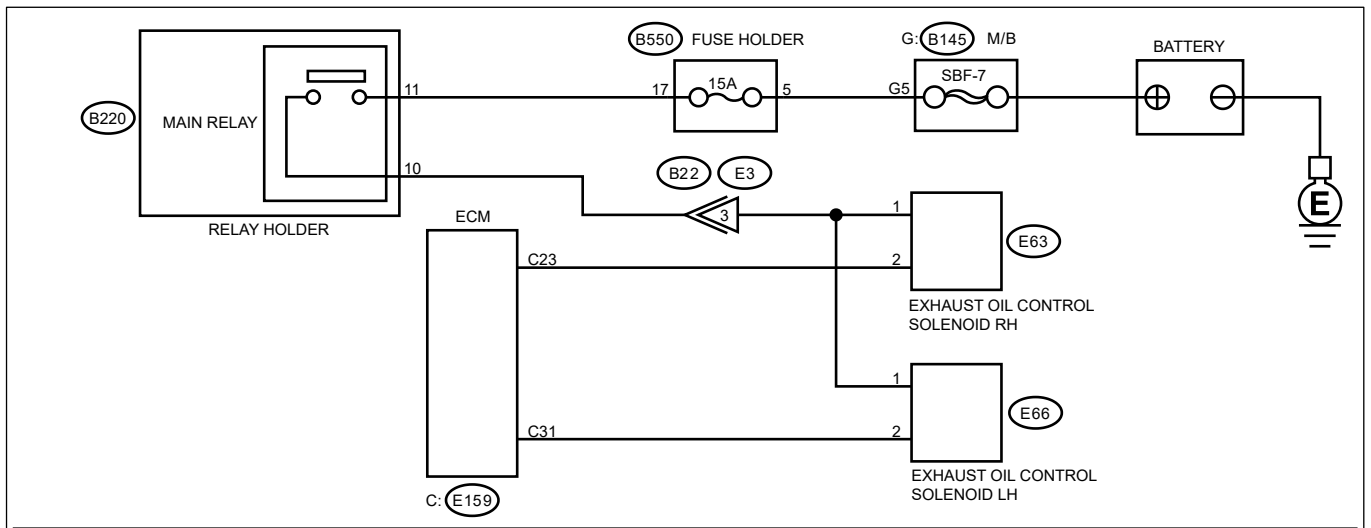
WIRING DIAGRAM:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.






EN-21603



EN-21598


1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)



DTC Check

Is DTC other than P000D and P0024 displayed? (Current malfunction)

Yes

Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)

No

Save the freeze frame data.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)
 [Go to 2.](#)

2. CHECK OUTPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and engine ground.

Connector & terminal

(E159) No. 31 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 3.](#)

No

 [Go to 4.](#)

3. CHECK FOR POOR CONTACT.

Check the ECM connector and harness.

Note:

Check the following items.

- Poor contact of ECM connector
- Temporary open or short circuit of harness
- Contamination, corrosion or looseness of engine ground terminal

Is the check result OK?

 [Go to 5.](#)

Yes

No

Repair or replace faulty parts.

4. CHECK POWER SUPPLY TO THE EXHAUST OIL CONTROL SOLENOID LH.


Measure the voltage between exhaust oil control solenoid LH connector and engine ground.

Connector & terminal

(E66) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 5.](#)

No

Repair the power supply circuit.

5. CHECK ENGINE OIL CONDITION.

Check the engine oil condition.

Note:

Check the following items.




- **Within the specified range in amount**
- **Excessively dirty**
- **Coagulated by additives**
- **Use of oil of specified viscosity**

Is the check result OK?


Yes


 [Go to 6.](#)

No



Adjust the oil amount, or replace the engine oil and engine oil filter.  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)
 [Go to 6.](#)

6. CHECK ON-BOARD MONITOR TEST RESULT.

1. Replace the exhaust oil control solenoid LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)

2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)



3. Perform drive cycle T.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Drive Cycle.](#)
4. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE\$06.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>General Scan Tool.](#)

Caution:

- **When performing driving cycle, there should be 2 persons (driver and checker) and the checker should perform the data check.**
- **When performing the drive cycle on the public road, be very careful of the traffic condition and the safe driving must be the high priority.**

Note:

- **When the diagnostic value is 0, the diagnosis is incomplete. Therefore, do not stop the engine and perform the drive cycle again.**
- **Always keep on checking the data while reading out the diagnostic value because the diagnostic value is repeatedly updated.**

5. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 2] of the replaced oil control solenoid 1000 or more?

Yes

 [Go to 8.](#)

No

 [Go to 7.](#)

7. CHECK ON-BOARD MONITOR TEST RESULT.




Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 6.

Is the value of [VVT monitor bank 2] 1000 or less, and more than (value of [VVT monitor bank 1] $\times 1.5 + 100$) compared with the value of [VVT monitor bank 1]?

Yes

 [Go to 8.](#)

No





Idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)
 [Go to 17.](#)

8. CHECK HARNESS AND CONNECTOR.

Check for a bend, damage and poor contact of harness and connector.


Note:

Check the following items.





- **ECM**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)
- **Oil control solenoid**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Oil Control Solenoid>INSPECTION.](#)
- **Camshaft position sensor**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Camshaft Position Sensor>INSPECTION.](#)
- **Crankshaft position sensor**  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor Plate>INSPECTION.](#)


Is the check result OK?

Yes

 [Go to 9.](#)

No

Repair or replace faulty parts.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\)>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Camshaft Position Sensor.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor Plate.](#)

 [Go to 9.](#)

9. CHECK HARNESS AND CONNECTOR (OPEN).


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the exhaust oil control solenoid LH.
4. Measure the resistance between exhaust oil control solenoid LH connector and ECM connector.

Connector & terminal

(E159) No. 31 — (E66) No. 2:


Is the resistance less than 1 Ω?

Yes

 [Go to 10.](#)

No

Repair or replace faulty parts.

 [Go to 17.](#)

10. CHECK HARNESS AND CONNECTOR (OPEN).


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from exhaust camshaft position sensor LH.
4. Measure the resistance between the exhaust camshaft position sensor LH connector and ECM connector.

Connector & terminal

(E158) No. 33 — (E65) No. 2:


Is the resistance less than 1 Ω ?

Yes

 [Go to 11.](#)

No

Repair or replace faulty parts.

 [Go to 17.](#)

11. CHECK HARNESS AND CONNECTOR (OPEN).




1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the crankshaft position sensor.
4. Measure the resistance between the crankshaft position sensor connector and ECM connector.

Connector & terminal

(E158) No. 19 — (E10) No. 2:


Is the resistance less than 1 Ω ?

Yes

 [Go to 12.](#)


No

Repair or replace faulty parts.

 [Go to 17.](#)


12. CHECK ENGINE OIL PRESSURE.




Check the engine oil pressure.  [Ref. to MECHANICAL\(H4DOTC\)>Engine Oil Pressure>INSPECTION.](#)

Is the oil pressure of engine oil normal?

Yes

 [Go to 14.](#)

No

 [Go to 13.](#)

13. CHECK OIL STRAINER.



Check the oil strainer. [Ref. to LUBRICATION\(H4DO\)>Oil Pan>INSPECTION.](#)

Does any foreign matter exist at the oil strainer in the oil pan?

Yes

Check and clean inside the oil strainer.

[Go to 14.](#)

No

Replace the chain cover. [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover.](#)

Caution:

Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)

[Go to 15.](#)

14. CHECK OIL PATH OF CHAIN COVER.



1. Remove the engine from the vehicle. [Ref. to MECHANICAL\(H4DOTC\)>Engine Assembly>REMOVAL.](#)
2. Check the oil path of the chain cover. [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSPECTION.](#)

Note:

Check the O-rings in the following oil path and also check that no foreign matter exists.

- Inlet of oil pump
- Outlet of oil pump
- Each O-ring in the path leading to left/right cylinder head
- Oil control solenoid
- Foreign matter exists

Is the check result OK?

Yes

[Go to 15.](#)


No

Replace faulty parts. If there is any foreign matter, replace the chain cover.

[Ref. to MECHANICAL\(H4DOTC\)>Chain Cover.](#)

[Go to 15.](#)

15. CHECK THE CAMSHAFT CONDITION.

1. Remove the timing chain.  [Ref. to MECHANICAL\(H4DOTC\)>Timing Chain Assembly>REMOVAL.](#)
2. Rotate the camshaft by hand to compare the rotational resistance of the four.


Note:

Check the following items if there is a clearly faulty condition in the camshaft (bank 2) such as restriction or rotational resistance by comparing it with the rotational resistance of the camshaft (bank 1).



- **Foreign matter attached to camshaft**
- **Damage of camshaft (scratching, galling, wear, etc.)**
- **Check for consequence from improper rotation of cam journal bearing**


Is the check result OK?

Yes

 [Go to 16.](#)

No

Replace the cam carrier and camshaft.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier.](#)  [Ref. to MECHANICAL\(H4DOTC\)>Camshaft.](#)


 [Go to 16.](#)

16. CHECK OIL PASSAGE BETWEEN OIL PUMP AND OIL CONTROL SOLENOID.

Visually check the following parts of the oil passage from the oil pump to the oil control solenoid to check obvious defectiveness such as foreign matter, clogging, etc.

- Oil passage in cam Carrier
- Oil passage on cylinder head side
- Oil passage at the joint between cam sprocket and camshaft
- Oil passage at the back of sprocket and the end of camshaft when the sprocket is removed

Note:

Refer to removal procedure of cam carrier in service manual.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>REMOVAL.](#)


Is the check result OK?


Yes


Replace the sprocket.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Sprocket.](#)

Caution:


- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of**

application.  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)



- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>ASSEMBLY.](#)

 [Go to 17.](#)



No


Remove the foreign matter. Replace the cam carrier oil filter (reuse not allowed).  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier.](#)

Caution:


- **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application.**  [Ref. to MECHANICAL\(H4DOTC\)>Chain Cover>INSTALLATION.](#)
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert)**  [Ref. to MECHANICAL\(H4DOTC\)>Cam Carrier>ASSEMBLY.](#)

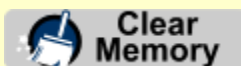
Note:



After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing).  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)  [Ref. to LUBRICATION\(H4DO\)>Engine Oil Filter>REMOVAL.](#)

 [Go to 17.](#)

17. CHECK ON-BOARD MONITOR TEST RESULT.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)



2. Perform drive cycle T.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Drive Cycle.](#)
3. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE\$06.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>General Scan Tool.](#)

Caution:

- **When performing driving cycle, there should be 2 persons (driver and checker) and the checker should perform the data check.**
- **When performing the drive cycle on the public road, be very careful of the traffic condition and the safe driving must be the high priority.**

Note:


- **When the diagnostic value is 0, the diagnosis is incomplete. Therefore, do not stop the engine and perform the drive cycle again.**

- **Keep on checking the data during drive cycle because the diagnostic value is repeatedly updated.**


4. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 2] 1000 or more?

Yes

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

No


 [Go to 18.](#)

18. CHECK DTC.

Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 17.

Is the value of [VVT monitor bank 2] 1000 or less, and more than (value of [VVT monitor bank 1] $\times 1.5 + 100$) compared with the value of [VVT monitor bank 1]?

Yes


Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

No

End.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0014.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0014 "B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0030 A/F / O2 HEATER CONTROL CIRCUIT BANK 1 SENSOR 1

DTC detecting condition:

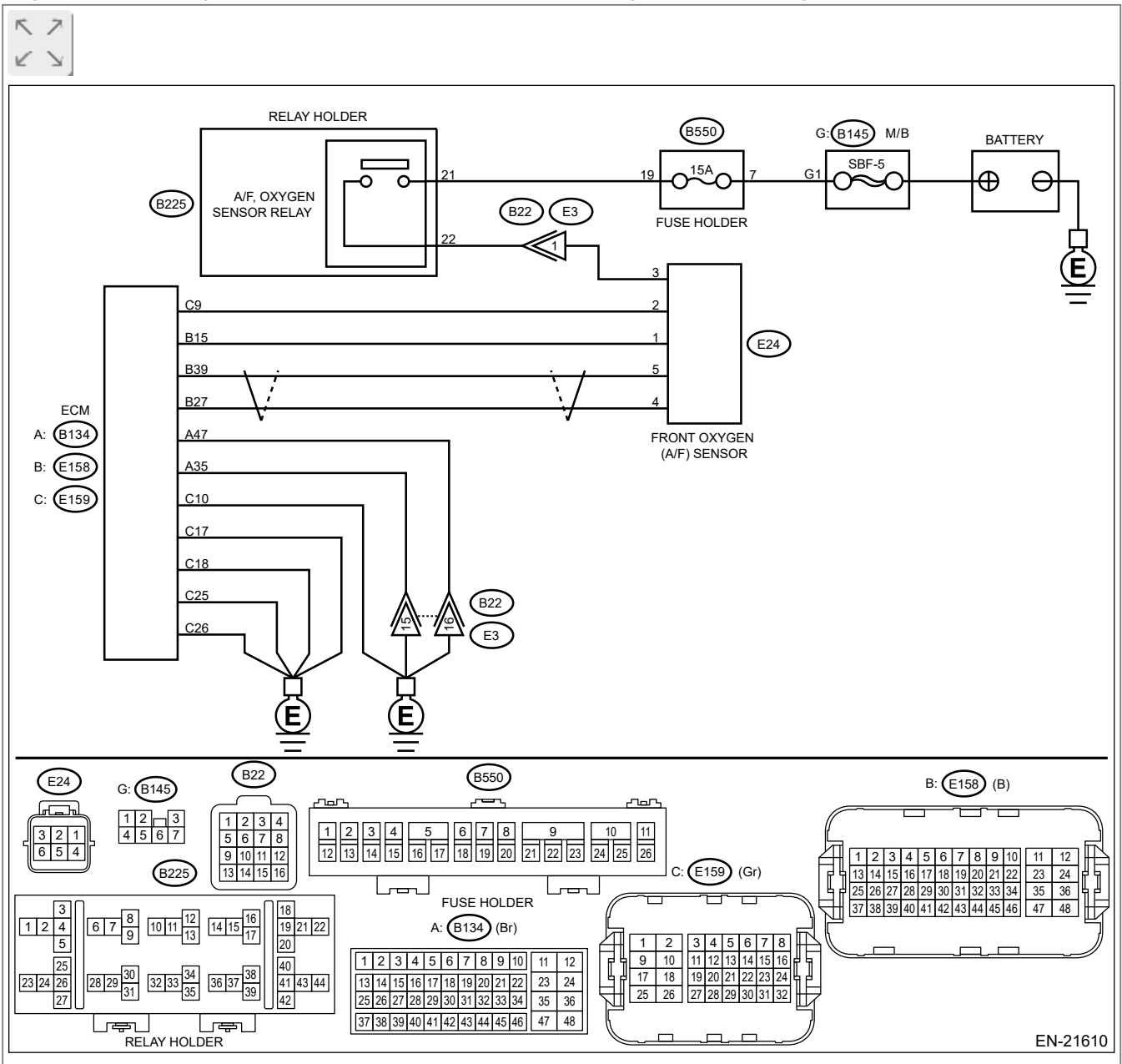
Detected when two consecutive driving cycles with fault occur.

Caution:

- After servicing or replacing faulty parts, perform Clear Memory Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.



1. Start and warm up the engine.
2. Turn the ignition switch to OFF.
3. Disconnect the connectors from front oxygen (A/F) sensor.
4. Disconnect the connector from ECM.
5. Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.

Connector & terminal

- (E158) No. 15 — (E24) No. 1:
- (E159) No. 9 — (E24) No. 2:
- (E158) No. 27 — (E24) No. 4:
- (E158) No. 39 — (E24) No. 5:

Is the resistance less than 1 Ω ?

Yes

[Go to 2.](#)

No

Repair the open circuit of harness between ECM and front oxygen (A/F) sensor connector.

2. CHECK FRONT OXYGEN (A/F) SENSOR.



Measure the resistance between front oxygen (A/F) sensor terminals.

Terminals

No. 2 — No. 3:

Is the resistance 2 — 3 Ω ?

Yes

[Go to 3.](#)

No

Replace the front oxygen (A/F) sensor. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Front Oxygen \(A/F\) Sensor.](#)

3. CHECK FOR POOR CONTACT.



Check for poor contact of ECM and front oxygen (A/F) sensor connector.

Is there poor contact of ECM or front oxygen (A/F) sensor connector?

Yes

Repair the poor contact of ECM or front oxygen (A/F) sensor connector.

No

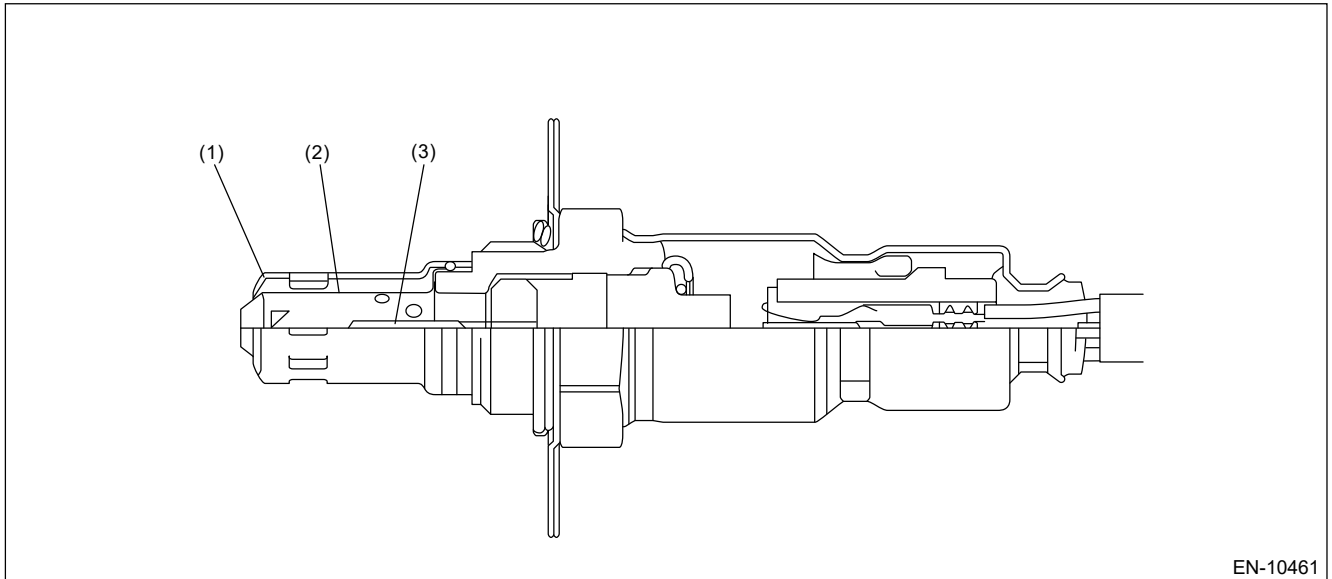
Replace the front oxygen (A/F) sensor. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Front Oxygen \(A/F\) Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect functional errors of the front oxygen (A/F) sensor heater.

Judge as NG when it is determined that the front oxygen (A/F) sensor impedance is large when looking at engine status such as deceleration fuel cut.

2. COMPONENT DESCRIPTION



(1) Element cover (outer)

(2) Element cover (inner)

(3) Sensor element

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
A/F sensor heater control duty	$> 21\%$

4. GENERAL DRIVING CYCLE

After starting the engine, perform the diagnosis continuously when engine is low speed.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Front oxygen (A/F) sensor impedance	$> 100 \Omega$

Time needed for diagnosis: 25 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0031 A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 1

DTC detecting condition:

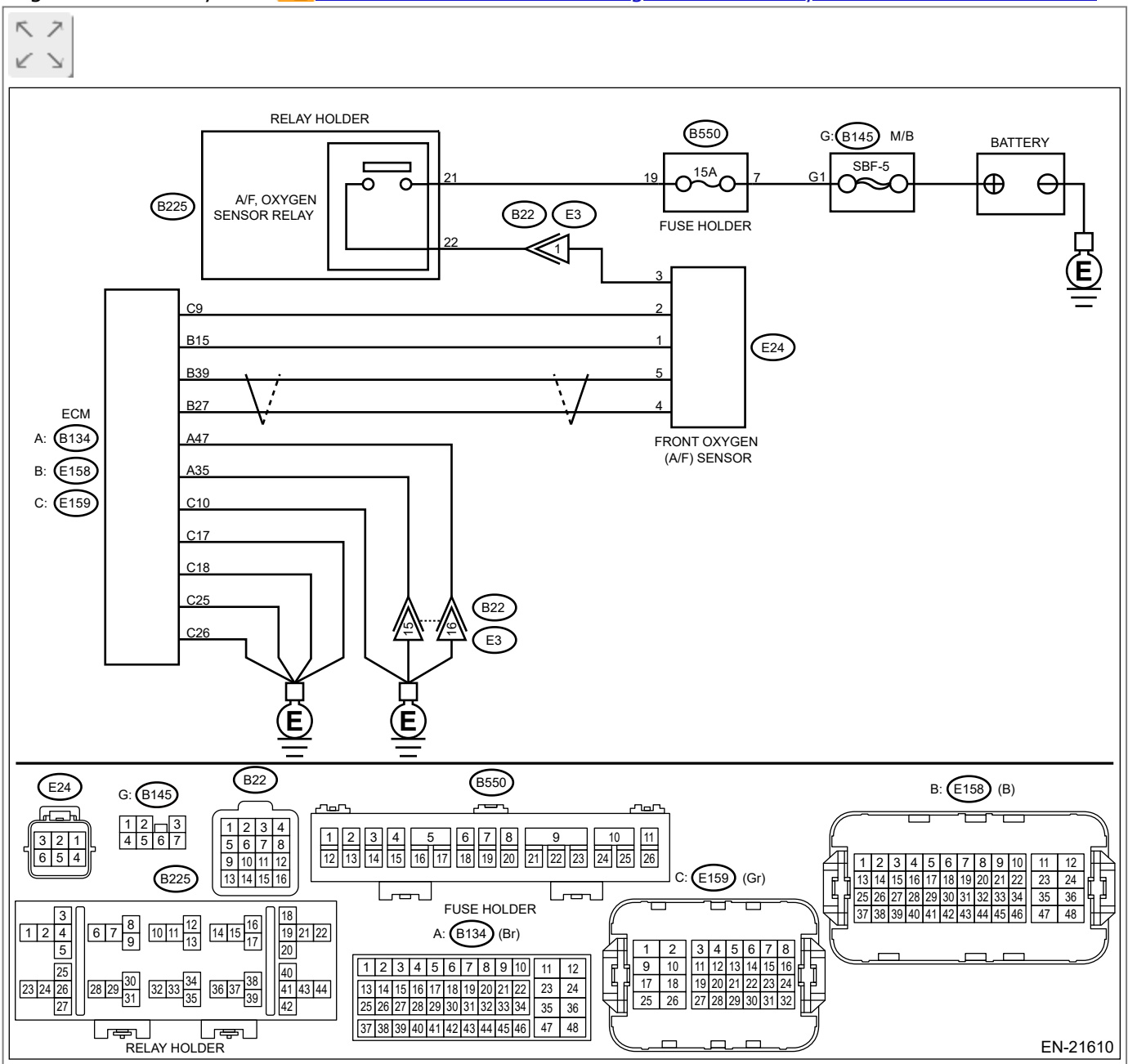
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform **Clear Memory**  **Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode**  **Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  **Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.**



1. CHECK POWER SUPPLY TO FRONT OXYGEN (A/F) SENSOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between front oxygen (A/F) sensor connector and engine ground.

Connector & terminal

(E24) No. 3 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

Repair the power supply line.

Note:

In this case, repair the following item:

- **Open circuit in harness between A/F, oxygen sensor relay and front oxygen (A/F) sensor connector**
- **Poor contact of A/F, oxygen sensor relay connector**
- **Poor contact of coupling connector**
- **Malfunction of A/F, oxygen sensor relay**

2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM and front oxygen (A/F) sensor connector.

Connector & terminal

(E24) No. 2 — (E159) No. 9:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit of harness between ECM and front oxygen (A/F) sensor connector.

3. CHECK GROUND CIRCUIT FOR ECM.




Measure the resistance of harness between ECM and engine ground.

Connector & terminal

(B134) No. 35 — Engine ground:
(B134) No. 47 — Engine ground:
(E159) No. 10 — Engine ground:
(E159) No. 17 — Engine ground:
(E159) No. 18 — Engine ground:
(E159) No. 25 — Engine ground:
(E159) No. 26 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM and engine ground**
- **Poor contact of coupling connector**

4. CHECK FRONT OXYGEN (A/F) SENSOR.



Measure the resistance between front oxygen (A/F) sensor terminals.

Terminals

No. 2 — No. 3:

Is the resistance 2 — 3 Ω ?

Yes

Repair the poor contact of ECM connector.

No

Replace the front oxygen (A/F) sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Front Oxygen \(A/F\) Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect front oxygen (A/F) sensor heater open or short circuit.

The front oxygen (A/F) sensor heater performs duty control, and the output terminal voltage at ON is 0 V, and the output terminal voltage at OFF is the battery voltage.

Judge as NG when the terminal voltage remains Low.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V

Front oxygen (A/F) sensor heater control duty	≤ 80%
--	-------

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	≤ 2.2 V

Time needed for diagnosis: 1000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0032 A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 1

DTC detecting condition:

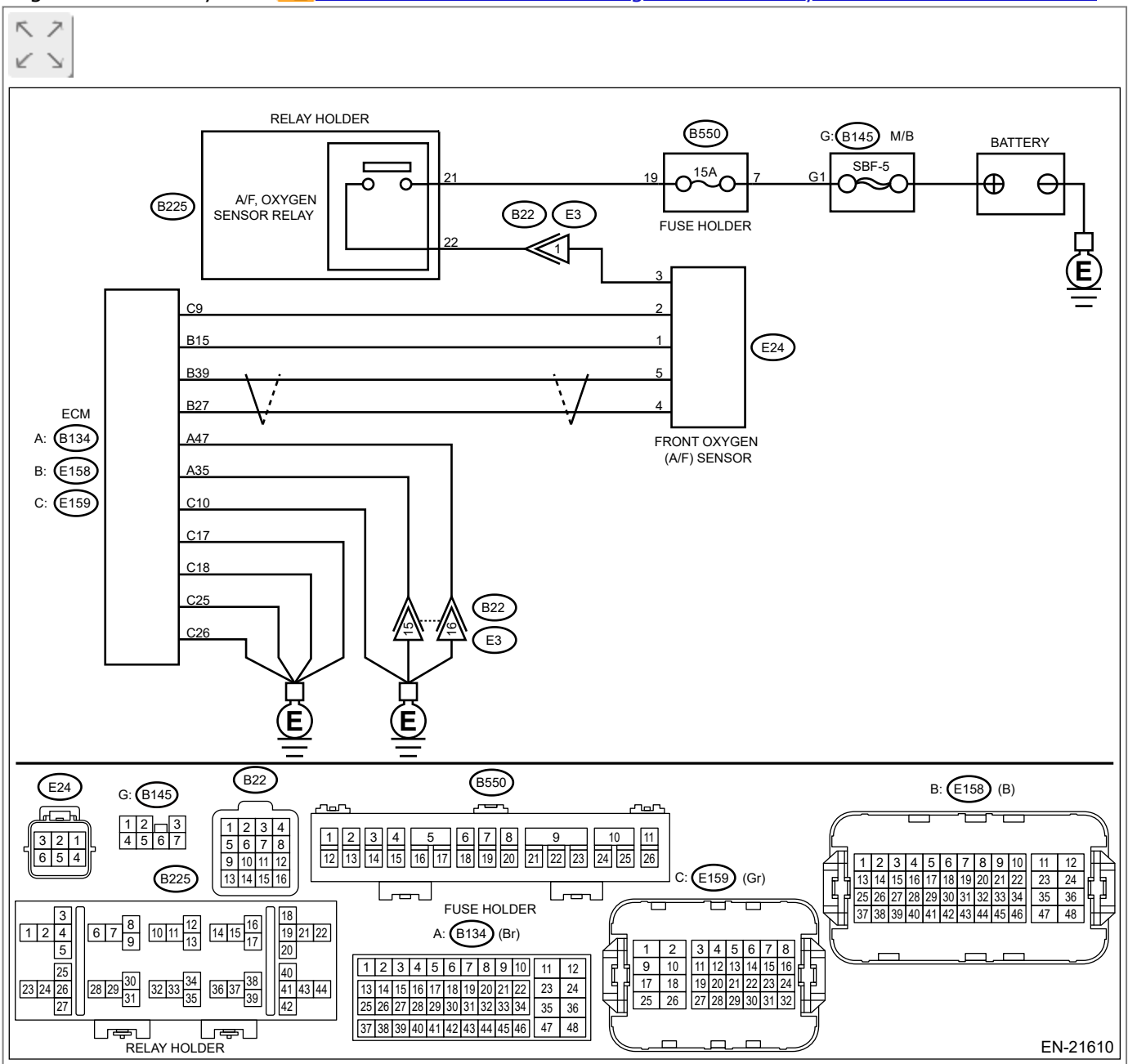
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform **Clear Memory**  **Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode**  **Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  **Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.**



1. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the voltage between ECM and engine ground.

Connector & terminal

(E159) No. 9 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power in the harness between ECM and front oxygen (A/F) sensor connector.

No

 [Go to 2.](#)

2. CHECK GROUND CIRCUIT FOR ECM.

1. Disconnect the connector from ECM.
2. Measure the resistance between ECM and engine ground.

Connector & terminal

(B134) No. 35 — Engine ground:

(B134) No. 47 — Engine ground:

(E159) No. 10 — Engine ground:

(E159) No. 17 — Engine ground:

(E159) No. 18 — Engine ground:

(E159) No. 25 — Engine ground:

(E159) No. 26 — Engine ground:

Is the resistance less than 5 Ω?

Yes

Repair the poor contact of ECM connector.

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM and engine ground**
- **Poor contact of coupling connector**

1. OUTLINE OF DIAGNOSIS

Detect front oxygen (A/F) sensor heater open or short circuit.

The front oxygen (A/F) sensor heater performs duty control, and the output terminal voltage at ON is 0 V, and the output terminal voltage at OFF is the battery voltage.

Judge as NG when overcurrent is detected.

Judge as NG when the terminal voltage remains High.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Front oxygen (A/F) sensor heater control duty	$\geq 20\%$

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output current	$\geq 17\text{A}$

Time needed for diagnosis: 2250 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0037 A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 2

DTC detecting condition:

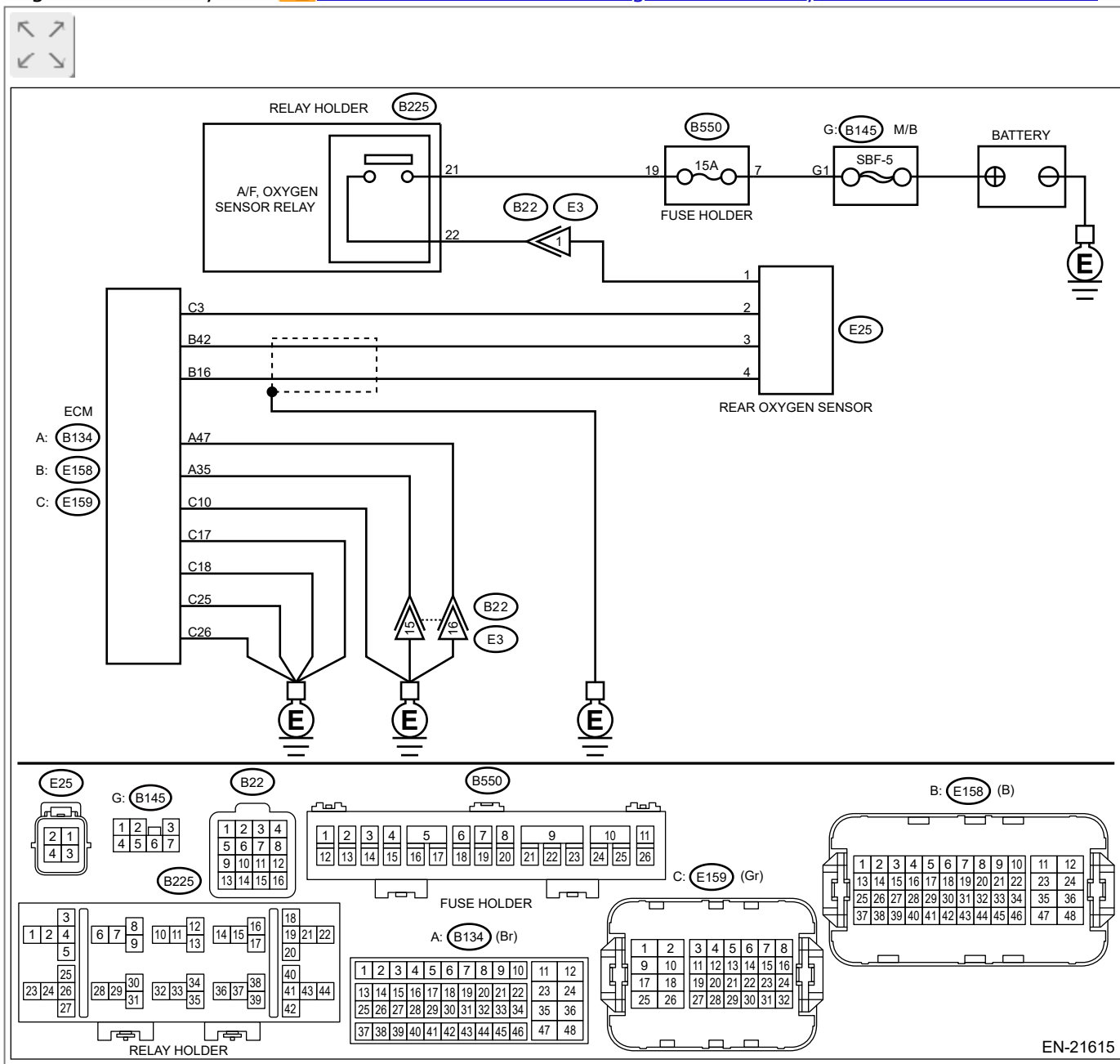
Detected when two consecutive driving cycles with fault occur.

Caution:

- After servicing or replacing faulty parts, perform **Clear Memory**  Ref. to **ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode**  Ref. to **ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to **WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.**



1. CHECK POWER SUPPLY TO REAR OXYGEN SENSOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from rear oxygen sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between rear oxygen sensor connector and engine ground.

Connector & terminal

(E25) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

Repair the power supply line.

Note:

In this case, repair the following item:

- **Open circuit in harness between A/F, oxygen sensor relay and rear oxygen sensor connector**
- **Poor contact of A/F, oxygen sensor relay connector**
- **Poor contact of coupling connector**
- **Malfunction of A/F, oxygen sensor relay**

2. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between the ECM and rear oxygen sensor connector.

Connector & terminal

(E25) No. 2 — (E159) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit of harness between ECM and rear oxygen sensor connector.

3. CHECK GROUND CIRCUIT FOR ECM.



Measure the resistance of harness between ECM and engine ground.

Connector & terminal

(B134) No. 35 — Engine ground:
(B134) No. 47 — Engine ground:
(E159) No. 10 — Engine ground:
(E159) No. 17 — Engine ground:
(E159) No. 18 — Engine ground:
(E159) No. 25 — Engine ground:
(E159) No. 26 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM and engine ground**
- **Poor contact of coupling connector**

4. CHECK REAR OXYGEN SENSOR.



Measure the resistance between rear oxygen sensor connector terminals.

Terminals


No. 1 — No. 2:

Is the resistance 5 — 7 Ω ?

Yes

Repair the poor contact of ECM connector.

No

Replace the rear oxygen sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Rear Oxygen Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the rear oxygen sensor heater open or short circuit.

The rear oxygen sensor heater performs duty control, and the output terminal voltage at ON is 0 V, and the output terminal voltage at OFF is the battery voltage.

Judge as NG when the terminal voltage remains Low.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V

Rear oxygen sensor heater control duty	≤ 96%
--	-------

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	≤ 2.2 V

Time needed for diagnosis: 2500 ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0038 A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 2

DTC detecting condition:

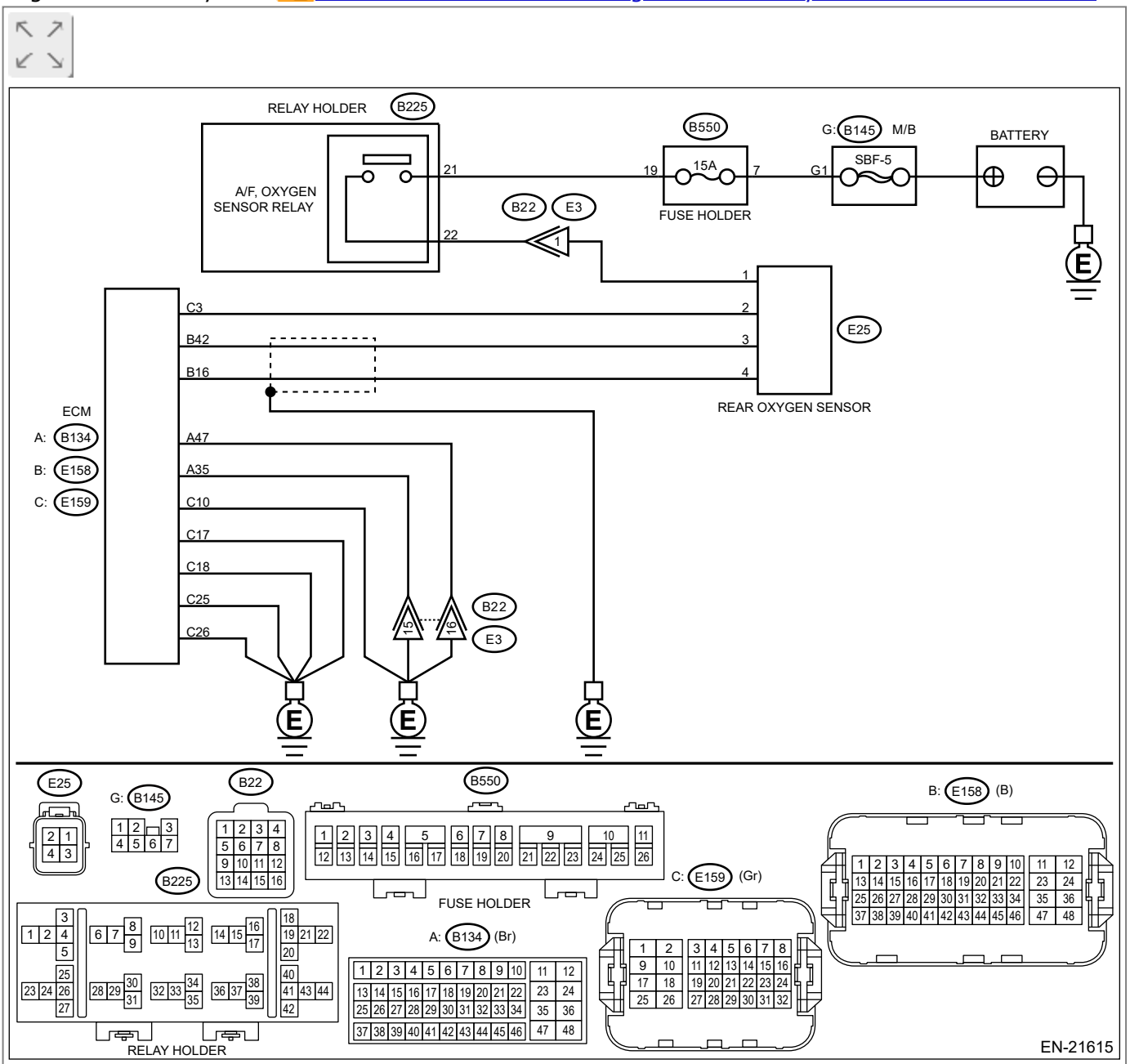
Detected when two consecutive driving cycles with fault occur.

Caution:

- After servicing or replacing faulty parts, perform **Clear Memory**  Ref. to **ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode.** and **Inspection Mode**  Ref. to **ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to **WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.**



1. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Measure the voltage between ECM and engine ground.

Connector & terminal

(E159) No. 3 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power in the harness between ECM and rear oxygen sensor connector.

No

 [Go to 2.](#)

2. CHECK GROUND CIRCUIT FOR ECM.



1. Disconnect the connector from ECM.
2. Measure the resistance between ECM and engine ground.

Connector & terminal

(B134) No. 35 — Engine ground:

(B134) No. 47 — Engine ground:

(E159) No. 10 — Engine ground:

(E159) No. 17 — Engine ground:

(E159) No. 18 — Engine ground:

(E159) No. 25 — Engine ground:

(E159) No. 26 — Engine ground:

Is the resistance less than 5 Ω?

Yes

Repair the poor contact of ECM connector.

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM and engine ground**
- **Poor contact of coupling connector**

1. OUTLINE OF DIAGNOSIS

Detect the rear oxygen sensor heater open or short circuit.

The rear oxygen sensor heater performs duty control, and the output terminal voltage at ON is 0 V, and the output terminal voltage at OFF is the battery voltage.
Judge as NG when overcurrent is detected.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Rear oxygen sensor heater control duty	$\geq 4\%$

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output current	≥ 17 A

Time needed for diagnosis: 2500 ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P0068 MAP/MAF - THROTTLE POSITION CORRELATION

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..


1. CHECK AIR INTAKE SYSTEM. 


Are there holes, loose bolts or disconnection of hose on air intake system?

Yes

Repair the air intake system.


No

 [Go to 2.](#)

2. CHECK MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR. 

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. Place the select lever in "P" range or "N" range.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Using the Subaru Select Monitor or a general scan tool, read the value of [Mani. Absolute Pressure].

Note:


- **Subaru Select Monitor**
For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE".  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Subaru Select Monitor.
- **General scan tool**
For detailed operation procedures, refer to the "General Scan Tool Instruction Manual".

Is the value of [Mani. Absolute Pressure] 73.3 — 106.6 kPa (550 — 800 mmHg, 21.65 — 31.50 inHg) at ignition ON, and 20.0 — 46.7 kPa (150 — 350 mmHg, 5.91 — 13.78 inHg) at idling?

Yes

 [Go to 3.](#)


No

Replace the manifold absolute pressure and intake air temperature sensor. 
[Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Manifold Absolute Pressure and Intake Air Temperature Sensor.](#)

3. CHECK THROTTLE OPENING ANGLE.

Using the Subaru Select Monitor or a general scan tool, read the value of [Throttle Opening Angle].

Note:


- **Subaru Select Monitor**
For detailed operation procedures, refer to "READ CURRENT DATA FOR ENGINE".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the "General Scan Tool Instruction Manual".

Is the value of [Throttle Opening Angle] less than 5% when throttle is fully closed?

Yes

 [Go to 4.](#)


No

Replace the electronic throttle control.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Throttle Body.](#)


4. CHECK THROTTLE OPENING ANGLE.

Is the value of [Throttle Opening Angle] 85% or more when throttle is fully open?

Yes

Replace the manifold absolute pressure and intake air temperature sensor. 
[Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Manifold Absolute Pressure and Intake Air Temperature Sensor.](#)

No

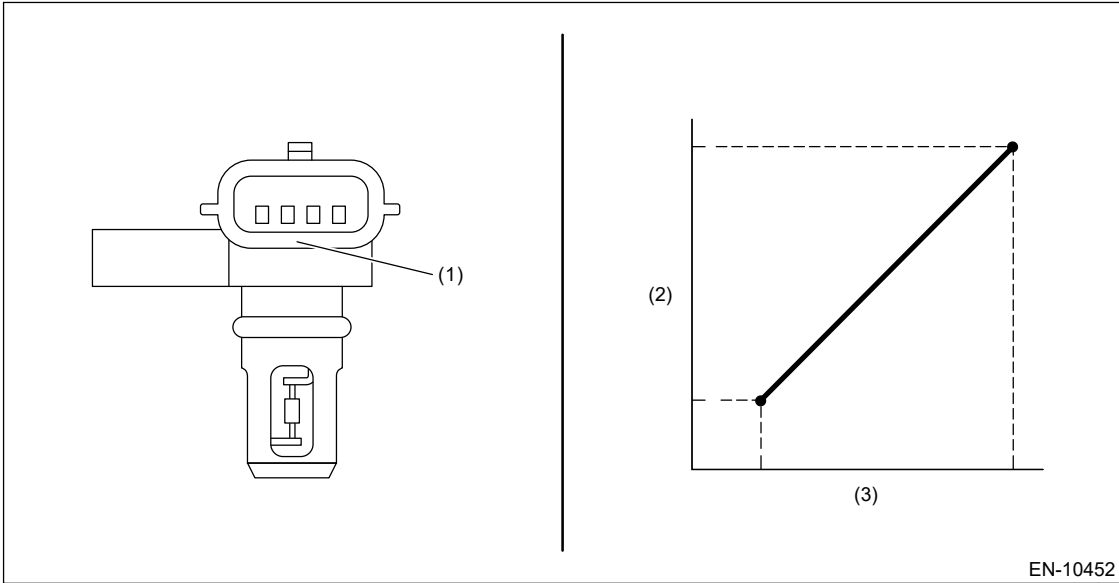
Replace the electronic throttle control.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Throttle Body.](#)

1. OUTLINE OF DIAGNOSIS

Detect problems in the manifold absolute pressure sensor output properties.

Judge as NG when the intake air pressure AD value is Low whereas it seemed to be High from the viewpoint of engine condition, or when it is High whereas it seemed to be Low from the engine condition.

2. COMPONENT DESCRIPTION



(1) Manifold absolute pressure sensor

(2) Voltage (V)

(3) Absolute pressure (kPa)

3. EXECUTION CONDITION

Low

Secondary Parameters	Execution condition
Engine speed	< 3600 rpm
Charging efficiency	≥ 95 air mass %
Throttle position	≥ 64%

High

Secondary Parameters	Execution condition
Engine speed	≥ 475 rpm and < 950 rpm
Charging efficiency	≤ 32 air mass %
Throttle position	≤ 5.6%

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after idling.

5. DIAGNOSTIC METHOD

Judge as NG when Low side or High side becomes NG.

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value

Low	
Intake manifold pressure (absolute pressure)	< 75 kPa (562.6 mmHg, 22.2 inHg)
High	
Intake manifold pressure (absolute pressure)	≥ 75 kPa (562.6 mmHg, 22.2 inHg)

Time needed for diagnosis:

Low side: 5000 ms

High side: 5000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0071 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" RANGE/PERFORMANCE

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Caution:


After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

1. CHECK FOR ANY OTHER DTC ON DISPLAY. 

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".

 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>List of Diagnostic Trouble Code (DTC).

No

 Go to 2.

2. CHECK CURRENT DATA. 

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Ambient air temperature].

Note:

- **Subaru Select Monitor**
For detailed operation procedures, refer to "READ CURRENT DATA FOR HVAC SYSTEM". Refer to HVAC SYSTEM (AUTO A/C) (DIAGNOSTICS) > READ CURRENT DATA.
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

3. Read the change of the value in [Ambient air temperature] while heating and cooling the ambient sensor using a hair dryer.

Caution:


Do not heat the part to the temperature where you cannot touch it with your bare hand in order to prevent burning yourself and protect the part.

Does the value of [Ambient air temperature] change between heating and cooling?

Yes

Repair the poor contact of ECM connector.

No

Replace the ambient sensor.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Ambient Sensor.](#)

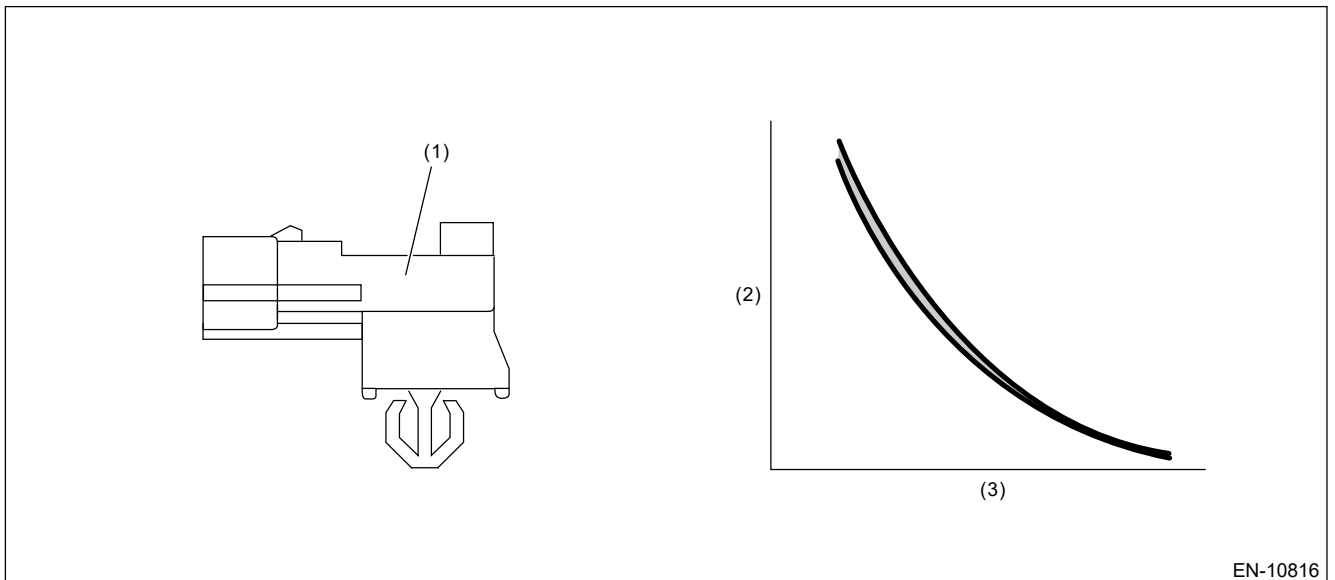
1. OUTLINE OF DIAGNOSIS

Detect the malfunction of ambient temperature sensor characteristics.

After the engine starts after the specified period of soaking time has elapsed, judge by correlation between ambient temperature sensor value, intake air temperature sensor value and engine coolant temperature sensor value. Judge as NG when the differences are both above the specified value by comparing between ambient air temperature and intake air temperature, ambient air temperature and engine coolant temperature.

2. COMPONENT DESCRIPTION

Ambient temperature sensor is connected to combination meter. ECM receives the data of ambient temperature sensor via CAN communication with combination meter.



EN-10816

(1) Ambient sensor

(2) Resistance value (kΩ)

(3) Ambient air temperature (°C (°F))

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Soaking time	≥ 21600 s
Block heater judgment	Completed
Block heater operation	Not in operation

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once after the engine starts after a certain period of soaking time.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Ambient air temperature 30 sec. after engine start – Intake air temperature 30 sec. after engine start	> Value from Map
Ambient air temperature at engine start – Engine coolant temperature at engine start	> 25°C (45°F)

Map

Intake air temperature °C (°F)	-30 (-22)	45 (113)	60 (140)	80 (176)
Ambient air temperature 30 sec. after engine start – Intake air temperature 30 sec. after engine start °C (°F)	20 (36)	20 (36)	32 (57.6)	32 (57.6)

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0072 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" LOW

DTC detecting condition:

Immediately at fault recognition

1. CHECK DTC.

Check for DTC. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is P0072 or P0073 displayed in current malfunction?

Yes

[Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK COMBINATION METER.

Check the combination meter system. [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System.](#)

Is the combination meter system normal?

Yes

Repair the poor contact of ECM connector.

No

Repair the combination meter system. [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System.](#)

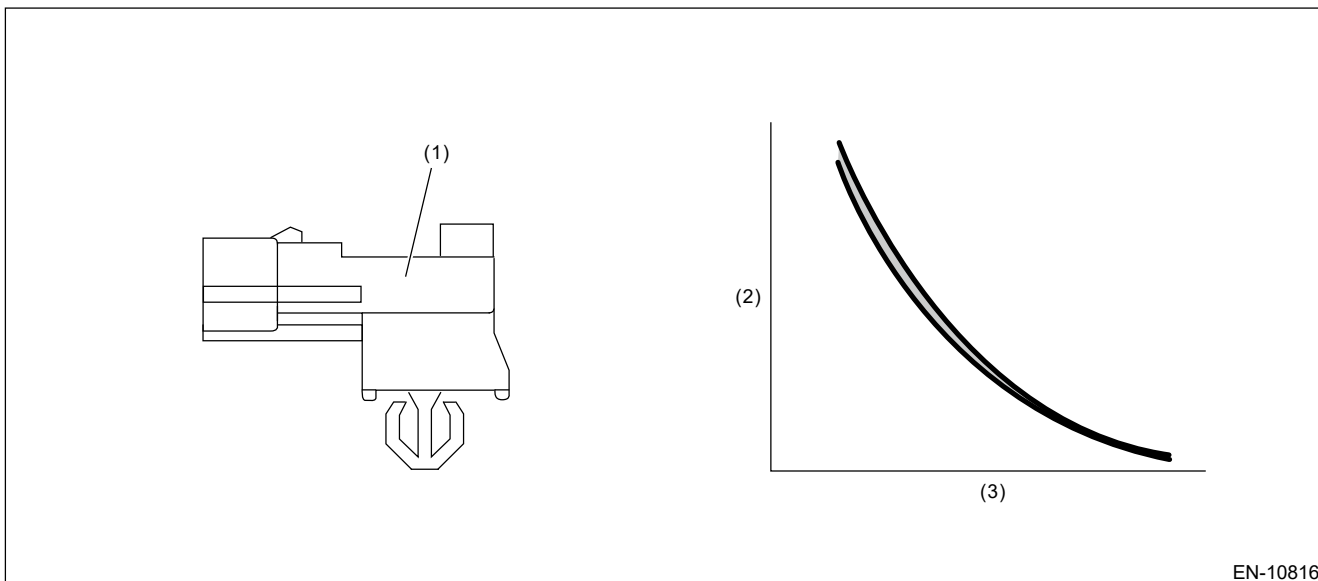
1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of ambient temperature sensor.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION

Ambient temperature sensor is connected to combination meter. ECM receives the data of ambient temperature sensor via CAN communication with combination meter.



EN-10816

(1) Ambient sensor

(2) Resistance value (kΩ)

(3) Ambient air temperature (°C (°F))

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	< 0.42 V


Time needed for diagnosis: 2.56 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0073 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" HIGH

Note:

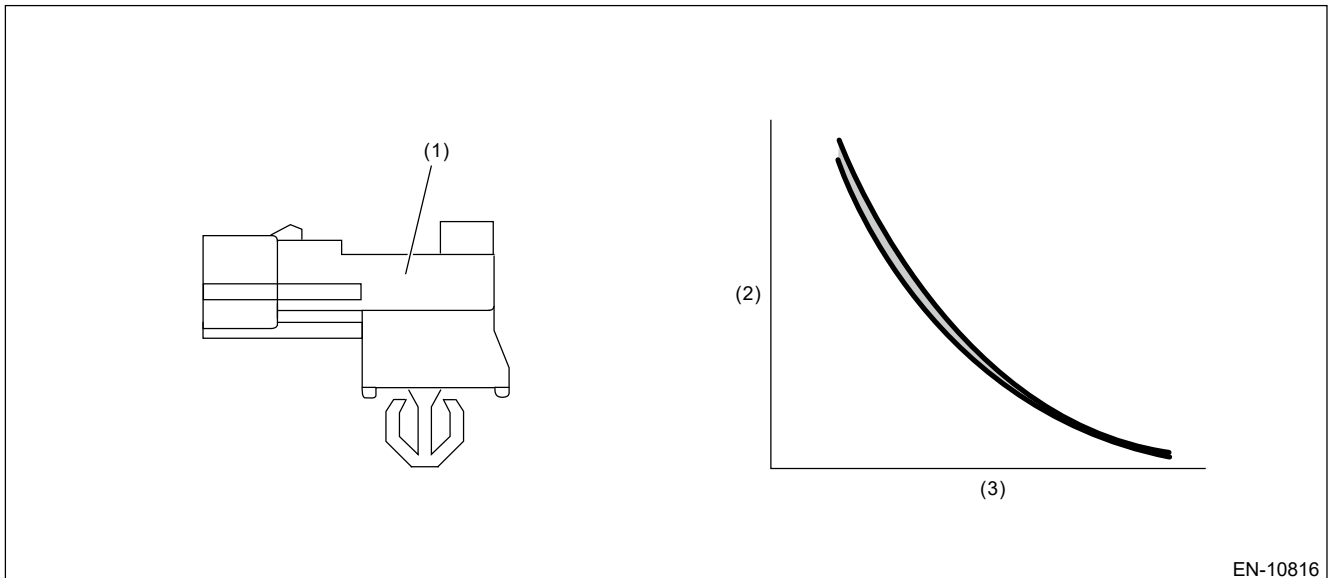
For the diagnostic procedure, refer to DTC P0072.  Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0072 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" LOW.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of ambient temperature sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION

Ambient temperature sensor is connected to combination meter. ECM receives the data of ambient temperature sensor via CAN communication with combination meter.



(1) Ambient sensor

(2) Resistance value (kΩ)

(3) Ambient air temperature (°C (°F))

EN-10816

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	> 4.88 V

Time needed for diagnosis: 2.56 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0087 FUEL RAIL/SYSTEM PRESSURE - TOO LOW BANK 1



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance
- Poor acceleration

Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

1. CHECK FOR FUEL DELIVERY LINE LEAKAGE.

Visually check the fuel delivery line for leakage.

Warning:



- **When checking fuel delivery line during engine operation, be very careful so that one's hair, body and clothes do not touch the rotating part in the engine compartment.**
- **If there is fuel leakage, the fuel can be combusted spontaneously by the engine heat, resulting in serious accident. Therefore, take extra care.**
- **Prepare the necessary fire-extinguishing appliance for immediate fire fighting in case of fire.**

Note:

Concerning the section where visible inspection is difficult, the fuel odor provides a good indication of determining the fuel leakage.

Are there leaks from the fuel delivery line?

Yes

Replace the faulty fuel delivery line.  Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Delivery and Evaporation Lines. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Injector.

No

 [Go to 2.](#)

2. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".

Yes

[Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 3.](#)

3. CHECK EXPERIENCE OF RUNNING OUT OF FUEL.

Check if there was an experience of running out of fuel using "Check List for Interview".

[Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Check List for Interview>CHECK > CHECK LIST NO. 2.](#)

Has the vehicle experienced running out of fuel?

Yes

Finish the diagnosis.

Note:

DTC may be stored by running out of fuel.

No

[Go to 4.](#)

4. CHECK FUEL PRESSURE.

1. Start the engine.
2. Using the Subaru Select Monitor, read the fuel pressure and the value of [Target Fuel pressure gauge] when racing the engine.

Note:

For detailed procedures, refer to "Data Monitor". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

Is the value of fuel pressure synchronized with that of [Target Fuel pressure gauge]?

Yes

[Go to 5.](#)

No

- The value in Fuel pressure gauge does not increase: [Go to 7.](#)
- The value in Fuel pressure gauge does not change: Replace the fuel pressure sensor. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Pressure Sensor.](#)

5. CHECK OF FUEL PUMP.

1. Turn the ignition switch to ON. (Engine OFF)


- From [Fuel Pump Control (ON/OFF Dr.)] of Active Test, check for the operating sound of the fuel pump when performing ON/OFF drive for the fuel pump.

Note:


For detailed operation procedures, refer to "PC application help for Subaru Select Monitor".

Does the fuel pump emit operating sound?


Yes

 [Go to 6.](#)

No


Check fuel pump circuit.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostics for Engine Starting Failure>FUEL PUMP CIRCUIT.](#)

6. CHECK FUEL PRESSURE (LOW PRESSURE SIDE).



Check the fuel pressure on low-pressure side.  [Ref. to MECHANICAL\(H4DOTC\)>Fuel Pressure>INSPECTION.](#)

Is the fuel pressure normal?

Yes

 [Go to 7.](#)


No

Check the fuel pump and fuel delivery line.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pump>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Delivery and Evaporation Lines>INSPECTION.](#)

7. CHECK FOR FUEL DELIVERY LINE LEAKAGE (HIGH PRESSURE SIDE).


- Start the engine.
- Using the Subaru Select Monitor, read the change in values of Fuel pressure gauge when stopping the engine.

Note:


- In order to maintain the communication with Subaru Select Monitor, turn the ignition switch to OFF, and immediately turn it to ON.**
- For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)**

Does the value in Fuel pressure gauge decrease rapidly?


Yes

 [Go to 8.](#)

No

 [Go to 9.](#)

8. CHECK HIGH-PRESSURE FUEL PUMP.


Check the high-pressure fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>High Pressure Fuel Pump>INSPECTION.](#)

Is the high-pressure fuel pump normal?




Yes

 [Go to 9.](#)

No



Replace the high-pressure fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>High Pressure Fuel Pump.](#)

9. CHECK FOR REPRODUCTION OF FAILURE.


1. Clear the memory.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)
2. Perform appropriate drive cycle test.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Drive Cycle.](#)
3. Read the DTC.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC as current diagnosis output?

Yes

Replace the high-pressure fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>High Pressure Fuel Pump.](#) After replacement, go to the next step.  [Go to 10.](#)



Note:

When the high-pressure fuel pump has been replaced in step 8, go to the next step without replacing the high-pressure fuel pump.  [Go to 11.](#)


No

End.

10. CHECK FOR REPRODUCTION OF FAILURE.


1. Clear the memory.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)
2. Perform appropriate drive cycle test.  [Ref. to ENGINE \(DIAGNOSTICS\)](#)

[\(H4DOTC\)>Drive Cycle.](#)

3. Read the DTC.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC as current diagnosis output?

Yes

 [Go to 11.](#)


No

End.

11. CHECK FOR FUEL DELIVERY LINE LEAKAGE (HIGH PRESSURE SIDE).


1. Start the engine.
2. Using the Subaru Select Monitor, read the change in values of Fuel pressure gauge when stopping the engine.

Note:

- In order to maintain the communication with Subaru Select Monitor, turn the ignition switch to OFF, and immediately turn it to ON.
- For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

Does the value in Fuel pressure gauge decrease rapidly?

Yes

Replace the fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Injector.](#)

No

Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0088.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0088 FUEL RAIL/SYSTEM PRESSURE - TOO HIGH BANK 1.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0088 FUEL RAIL/SYSTEM PRESSURE - TOO HIGH BANK 1



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Poor driving performance
- Poor acceleration


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 2.](#)


2. CHECK FUEL PRESSURE.

1. Start the engine.
2. Using Subaru Select Monitor, read the fuel pressure and the value of [Target Fuel pressure gauge] while the vehicle is accelerated from the parked state to 60 km/h (37.3 MPH) and stops again.

Caution:

- Follow traffic rules and give the highest priority to safe driving.
- During driving, do not operate or gaze at the Subaru Select Monitor.
- Always check the measurement value after bringing the vehicle to a stop in a safe place.

Note:

- In order to apply the running load to the vehicle, actually drive the vehicle, and read the measurement value.
- For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

Is the value of fuel pressure synchronized with that of [Target Fuel pressure gauge]?

Yes

Replace the high-pressure fuel pump. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>High Pressure Fuel Pump.](#) After replacement, go to the next step. [Go to 3.](#)

No

Replace the fuel pressure sensor. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pressure Sensor.](#)

3. CHECK FOR REPRODUCTION OF FAILURE.

1. Clear the memory. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)
2. Perform appropriate drive cycle test. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Drive Cycle.](#)
3. Read the DTC. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is the same DTC as current diagnosis output?

Yes

Repair the poor contact of ECM connector.

No

End.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of high pressure fuel system function.
Judge as NG when actual pressure is not close to target pressure.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Continuous time after fuel cut Target pressure change every 10 ms	> 3 s ≤ 500 kPa (3750.3 mmHg, 147.7 inHg)

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

--	--	--

Malfunction Criteria	Threshold Value	DTC
Target fuel pressure - Actual fuel pressure	< 3300 kPa (24752.1 mmHg, 974.5 inHg)	P0087
Actual fuel pressure - Target fuel pressure	> 6000 kPa (45003.8 mmHg, 1771.8 inHg)	P0088

Time needed for diagnosis: 10 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0096 INTAKE AIR TEMPERATURE SENSOR 2 CIRCUIT RANGE/PERFORMANCE BANK 1



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Improper idling
- Poor driving performance


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..


1. CHECK FOR ANY OTHER DTC ON DISPLAY. 

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>List of Diagnostic Trouble Code (DTC).


No

 Go to 2.

2. CHECK CURRENT DATA. 

1. Turn the ignition switch to ON.
2. Read the value of intake air temperature sensor #12 using the Subaru Select Monitor or a general scan tool.

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Subaru Select Monitor.
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

3. Read the change of the value in intake air temperature sensor #12 while heating and cooling the manifold absolute pressure and intake air temperature sensor using a hair dryer.

Caution:


Do not heat the part to the temperature where you cannot touch it with your bare hand in order to prevent burning yourself and protect the part.

Does the value of intake air temperature sensor #12 change between heating and cooling?

Yes

Repair the poor contact of ECM connector.

No

Replace the manifold absolute pressure and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Manifold Absolute Pressure and Intake Air Temperature Sensor.](#)

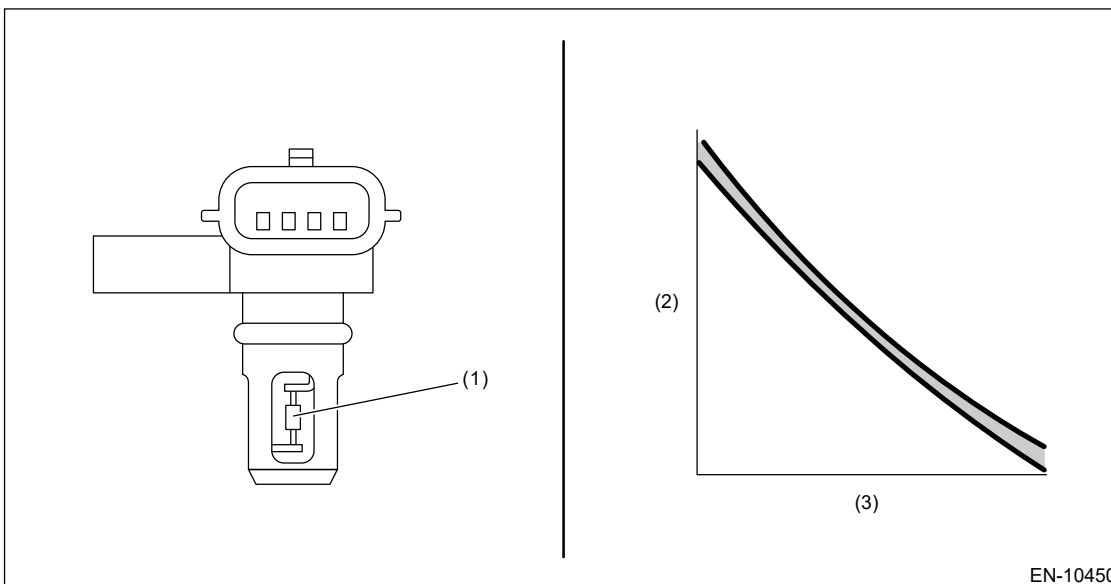
1. OUTLINE OF DIAGNOSIS

Detect the malfunction of the intake air temperature sensor (integrated with manifold absolute pressure sensor) output properties. Using the following two diagnoses, judge as NG when either is NG.

- **Diagnosis 1 (correlation diagnosis):** After the engine starts after the specified period of soaking time has elapsed, diagnose by correlation between intake air temperature sensor value, engine coolant temperature sensor value and ambient temperature sensor value. Judge as NG when the differences are both above the specified value by comparing between intake air temperature and engine coolant temperature, intake air temperature and ambient air temperature.
- **Diagnosis 2 (stuck diagnosis):** Judge as NG when intake air temperature does not change under the driving condition where it should change, considering engine condition.

2. COMPONENT DESCRIPTION

Intake air temperature sensor (integrated with manifold absolute pressure sensor)



(1) Intake air temperature sensor

(2) Resistance value (Ω)

(3) Intake air temperature °C (°F)

3. EXECUTION CONDITION

Diagnosis 1

Secondary Parameters	Execution condition

Battery voltage	≥ 10.9 V
Soaking time	≥ 21600 s
Block heater judgment	Completed
Block heater operation	Not in operation

Diagnosis 2

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Engine coolant temperature	≥ 60°C (140°F)
Integrated value of intake air amount	≥ 5,500 g
Number of experiences under following driving conditions	≥ 3 times
• Duration of driving condition 1	≥ 10 s
Vehicle speed	≥ 40 km/h
and	(24.9 MPH)
Amount of intake air	≥ 10 g/s
• Duration of driving condition 2	≥ 15 s
Vehicle speed	< 4 km/h
	(2.5 MPH)

4. GENERAL DRIVING CYCLE

- **Diagnosis 1:** Perform the diagnosis only once after the engine starts after a certain period of soaking time.
- **Diagnosis 2:** Perform the diagnosis when the vehicle speed condition is met after warming up from a cold condition.

5. DIAGNOSTIC METHOD

Judge as NG when Diagnosis 1 or Diagnosis 2 becomes NG.

Diagnosis 1

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Intake air temperature 30 sec. after engine start – Intake air temperature 30 sec. after engine start	> Value of Map 1
Intake air temperature 30 sec. after engine start – Ambient air temperature 30 sec. after engine start	> Value of Map 2

Map 1

--	--	--	--	--

Ambient temperature °C (°F)	-30 (-22)	30 (86)	45 (113)	60 (140)
Intake air temperature 30 sec. after engine start – Intake air temperature 30 sec. after engine start °C (°F)	11 (19.8)	11 (19.8)	11 (19.8)	11 (19.8)

Map 2

Ambient temperature °C (°F)	-30 (-22)	30 (86)	45 (113)	60 (140)
Intake air temperature 30 sec. after engine start – Ambient air temperature 30 sec. after engine start °C (°F)	20 (36)	20 (36)	32 (57.6)	32 (57.6)

Time needed for diagnosis: Less than 1 second

Diagnosis 2

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage difference between Max. and Min.	< 0.02 V (Equivalent to approximately 0.5°C (0.9°F) near 25°C (77°F))

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0097 INTAKE AIR TEMPERATURE SENSOR 2 CIRCUIT LOW BANK 1



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

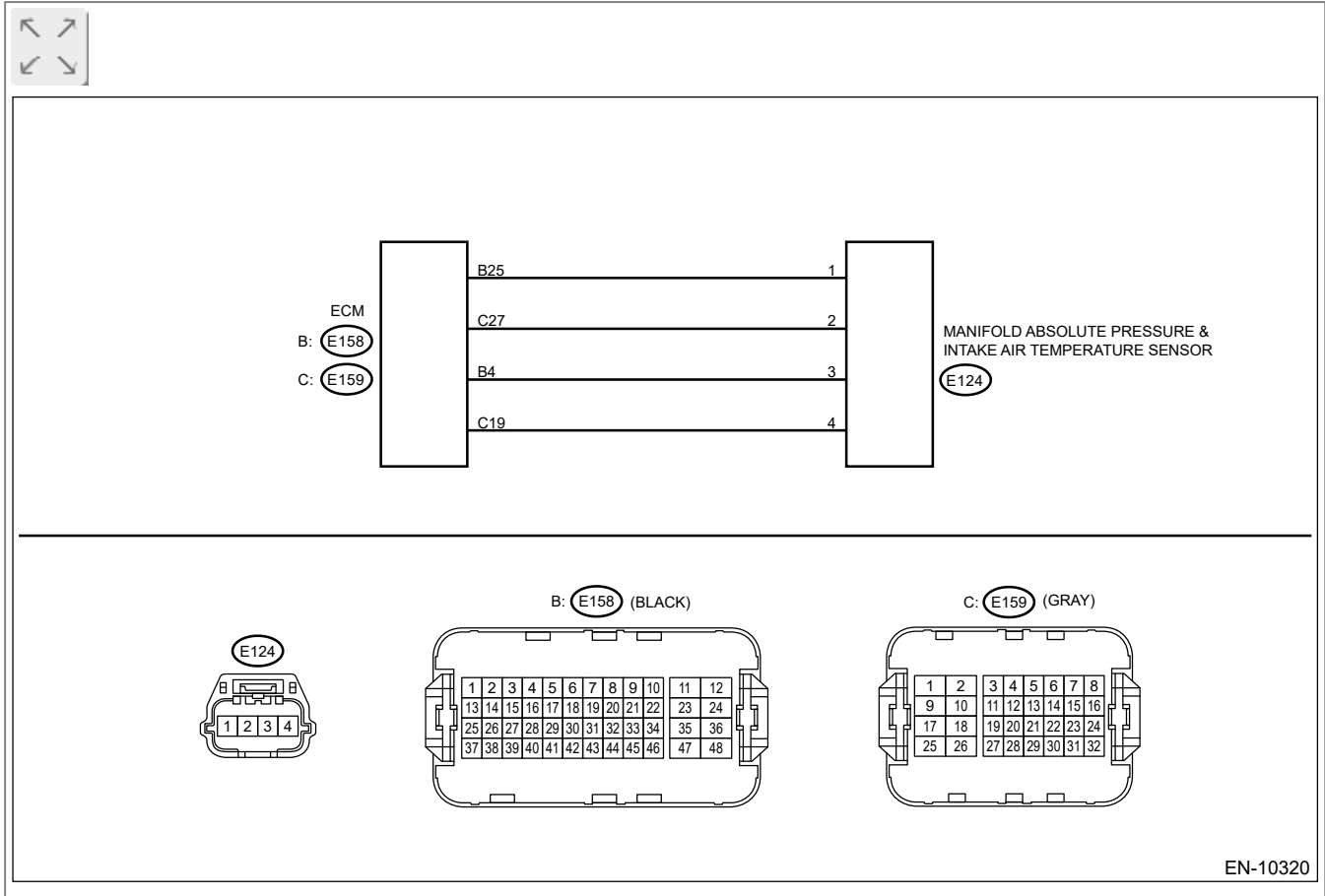
- Improper idling
- Poor driving performance

Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.




EN-10320

1. CHECK CURRENT DATA.


1. Start the engine.
2. Read the value of intake air temperature sensor #12 using the Subaru Select Monitor or a general scan tool.

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value in intake air temperature sensor #12 120°C (248°F) or more?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from the manifold absolute pressure and intake air temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM and engine ground.

Connector & terminal

(E158) No. 25 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

Replace the manifold absolute pressure and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Manifold Absolute Pressure and Intake Air Temperature Sensor.](#)

No

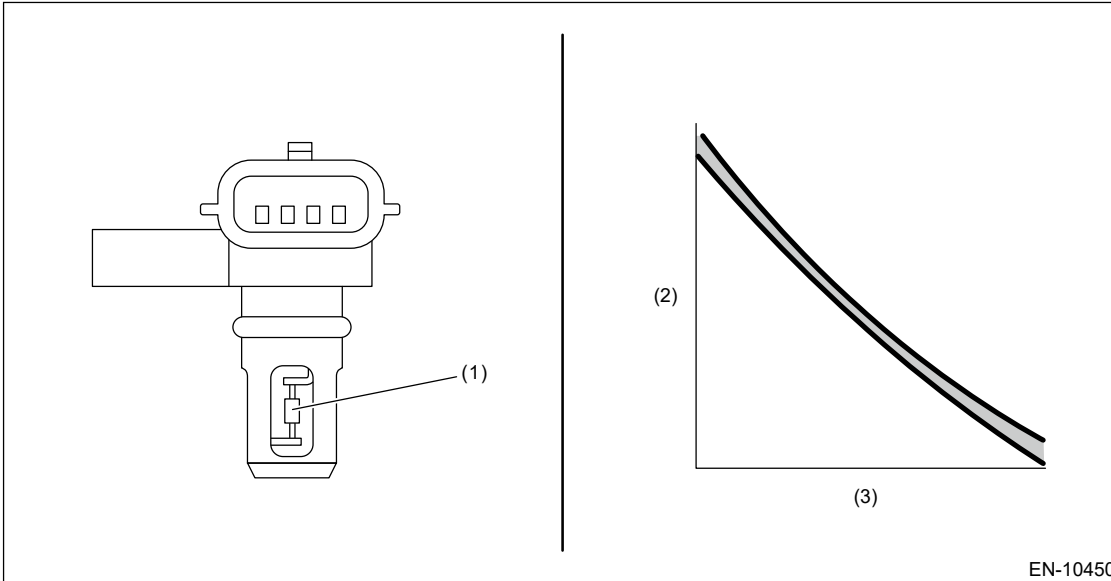
Repair the short circuit to ground in harness between ECM and manifold absolute pressure and intake air temperature sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of the intake air temperature sensor (integrated with manifold absolute pressure sensor).

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Intake air temperature sensor

(2) Resistance value (kΩ)

(3) Intake air temperature (°C (°F))

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	< 0.22 V

Time needed for diagnosis: 520 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0098 INTAKE AIR TEMPERATURE SENSOR 2 CIRCUIT HIGH BANK 1



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

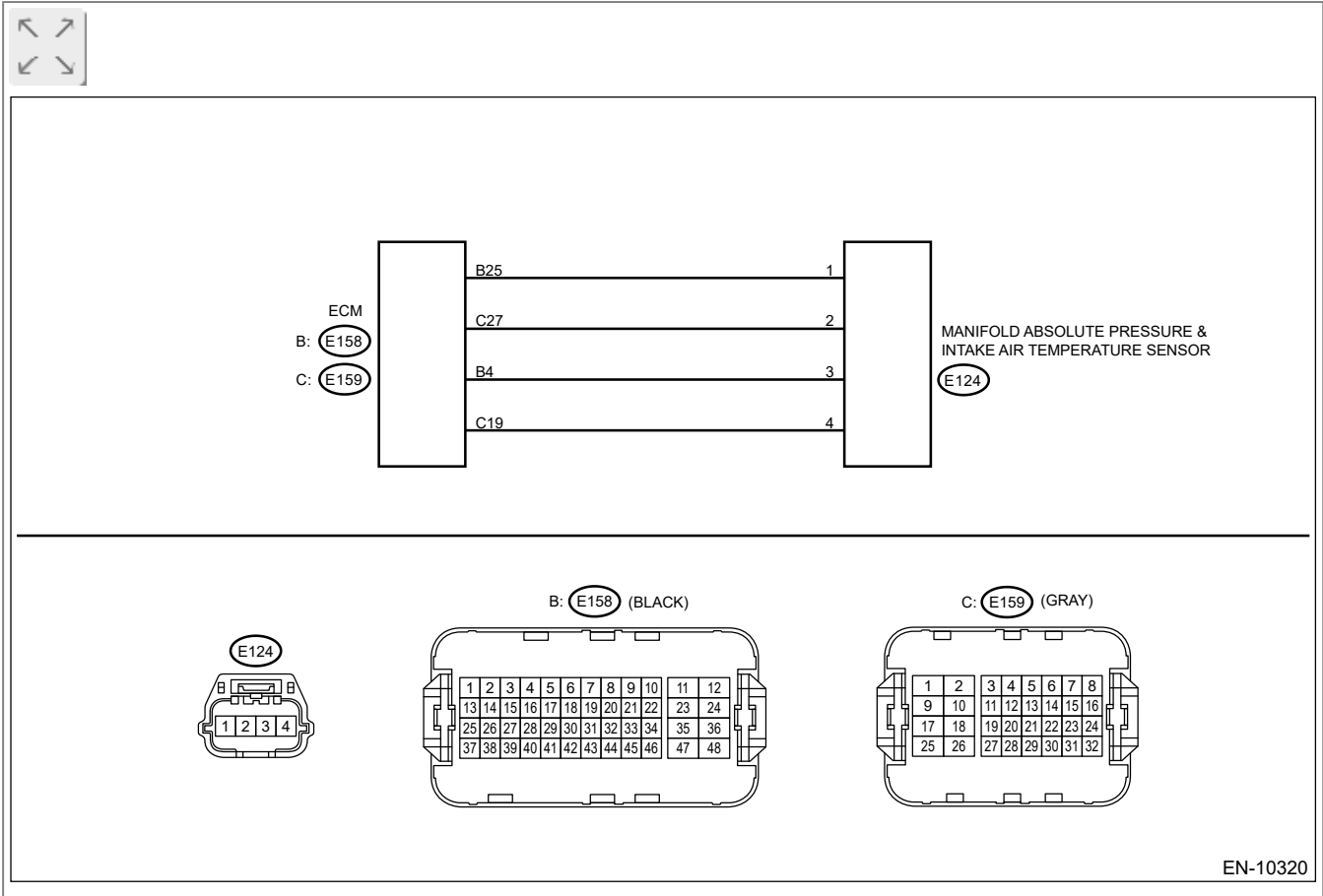
- Improper idling
- Poor driving performance

Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:


Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK CURRENT DATA.

1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of Intake Air Temperature (B1-S2).

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value in intake air temperature sensor #12 less than -40°C (-40°F)?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK FOR POOR CONTACT.


Check for poor contact of ECM and manifold absolute pressure and intake air temperature sensor connector.

Is there poor contact of ECM or manifold absolute pressure and intake air temperature sensor connector?

Yes

Repair the poor contact of ECM or manifold absolute pressure and intake air temperature sensor connector.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the manifold absolute pressure and intake air temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and the manifold absolute pressure and intake air temperature sensor connector.

Connector & terminal

(E158) No. 25 — (E124) No. 1:

(E159) No. 27 — (E124) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Repair the open circuit in harness between ECM and manifold absolute pressure and intake air temperature sensor connector.

4. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM and engine ground.

Connector & terminal


(E158) No. 25 (+) — Engine ground (–):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in harness between ECM and the manifold absolute pressure and intake air temperature sensor connector.

No

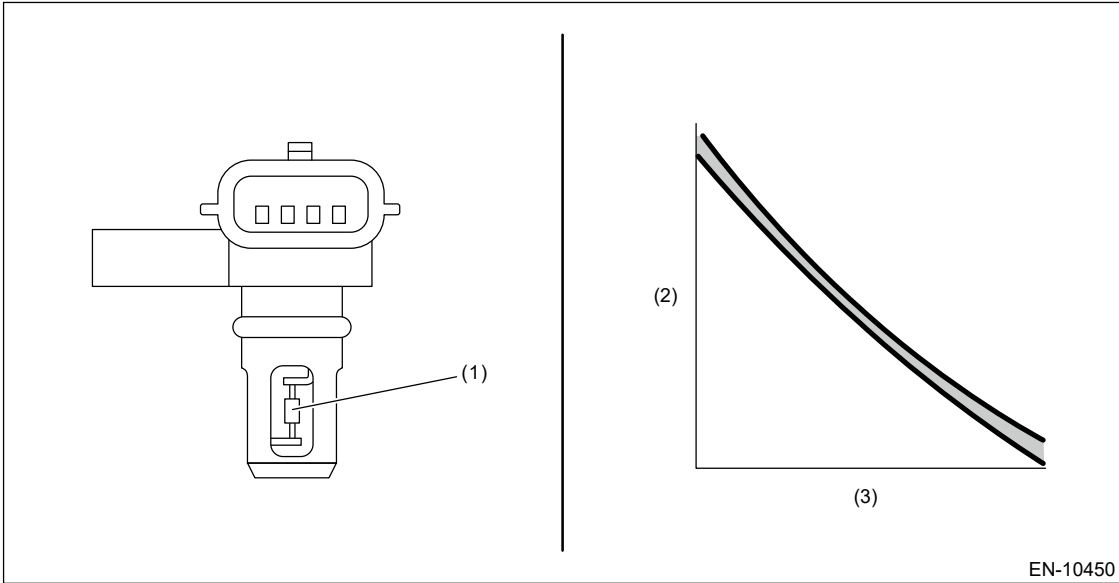
Replace the manifold absolute pressure and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Manifold Absolute Pressure and Intake Air Temperature Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of the intake air temperature sensor (integrated with manifold absolute pressure sensor).

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-10450

- (1) Intake air temperature sensor (2) Resistance value (kΩ) (3) Intake air temperature (°C (°F))

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	> 4.72 V

Time needed for diagnosis: 520 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0101 MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT RANGE/PERFORMANCE



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Improper idling
- Engine stalls.
- Poor driving performance


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..


1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".
 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>List of Diagnostic Trouble Code (DTC).

No

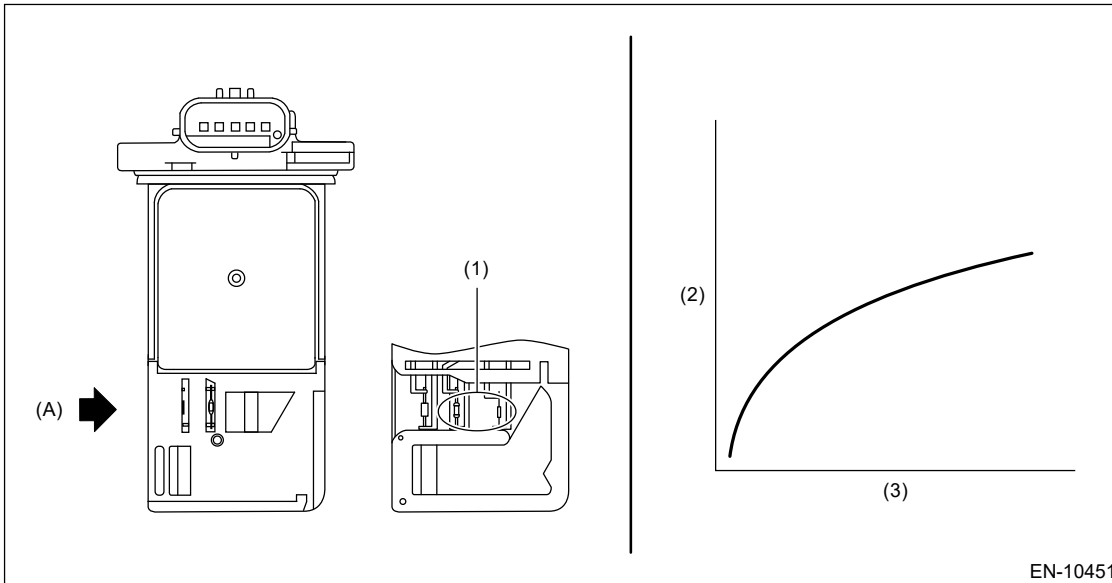
Replace the mass air flow and intake air temperature sensor.  Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Mass Air Flow and Intake Air Temperature Sensor.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of air flow sensor output properties.

Judge as a low side NG when the air flow voltage indicates a small value regardless of running in a state where the air flow voltage increases. Judge as a high side NG when the air flow voltage indicates a large value regardless of running in a state where the air flow voltage decreases. Judge air flow sensor property NG when the Low side or High side becomes NG.

2. COMPONENT DESCRIPTION



EN-10451

(A) Air

(1) Air flow sensor

(2) Voltage (V)

(3) Intake air amount (g (oz)/s)

3. EXECUTION CONDITION

Low

Secondary Parameters	Execution condition
Engine speed	≥ 1500 rpm
Throttle position	$\geq 12\%$
Intake manifold pressure (with atmospheric pressure compensation)	≥ 100 kPa (750.1 mmHg, 29.5 inHg)

High

Secondary Parameters	Execution condition
Engine speed	≥ 475 rpm and < 900 rpm
Throttle position	$< 4.8\%$
Intake manifold pressure (with atmospheric pressure compensation)	< 64 kPa (480 mmHg, 18.9 inHg)

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after idling.

5. DIAGNOSTIC METHOD

Judge as NG when Low side or High side becomes NG.

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Low Output voltage	< Map 1
High Output voltage	≥ Map 2

Map 1

Engine speed (rpm)	1500	3000	4000	5000	6000	6500
Output voltage value (V)	1.48	1.48	1.48	1.48	1.48	1.48
Air amount (g/s)	10.84	10.84	10.84	10.84	10.84	10.84

Map 2

Engine speed (rpm)	475	700	900
Output voltage value (V)	1.48	1.48	1.48
Air amount (g/s)	10.84	10.84	10.84

Time Needed for Diagnosis:

Low: 5 s

High: 5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0102 MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT LOW



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

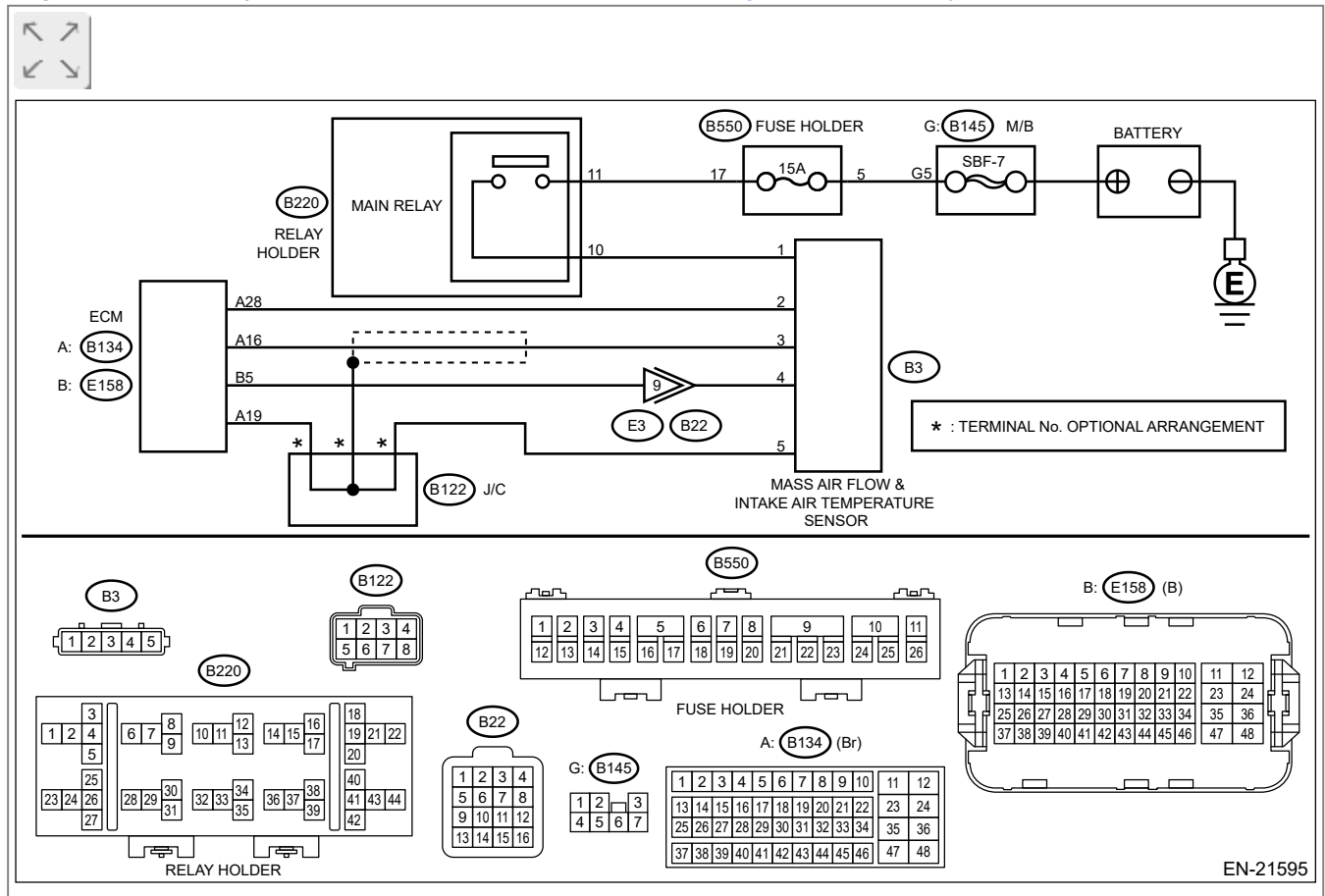
- Improper idling
- Engine stalls.
- Poor driving performance

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:


Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK CURRENT DATA.


1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Air Flow Sensor Voltage].

Note:

For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

Is the value of [Air Flow Sensor Voltage] less than 0.2 V?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK POWER SUPPLY OF MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the mass air flow and intake air temperature sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between mass air flow and intake air temperature sensor connector and engine ground.

Connector & terminal

(B3) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between main relay and mass air flow and intake air temperature sensor connector**
- **Poor contact of main relay connector**

3. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM and the mass air flow and intake air temperature sensor connector.

Connector & terminal

(B134) No. 16 — (B3) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Repair the open circuit in harness between ECM and the mass air flow and intake air temperature sensor connector.

4. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.


Measure the resistance between ECM and engine ground.

Connector & terminal

(B134) No. 16 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM and mass air flow and intake air temperature sensor connector.

5. CHECK FOR POOR CONTACT.


Check for poor contact of ECM and mass air flow and intake air temperature sensor connector.

Is there poor contact of ECM or mass air flow and intake air temperature sensor connector?

Yes

Repair the poor contact of ECM or mass air flow and intake air temperature sensor connector.

No

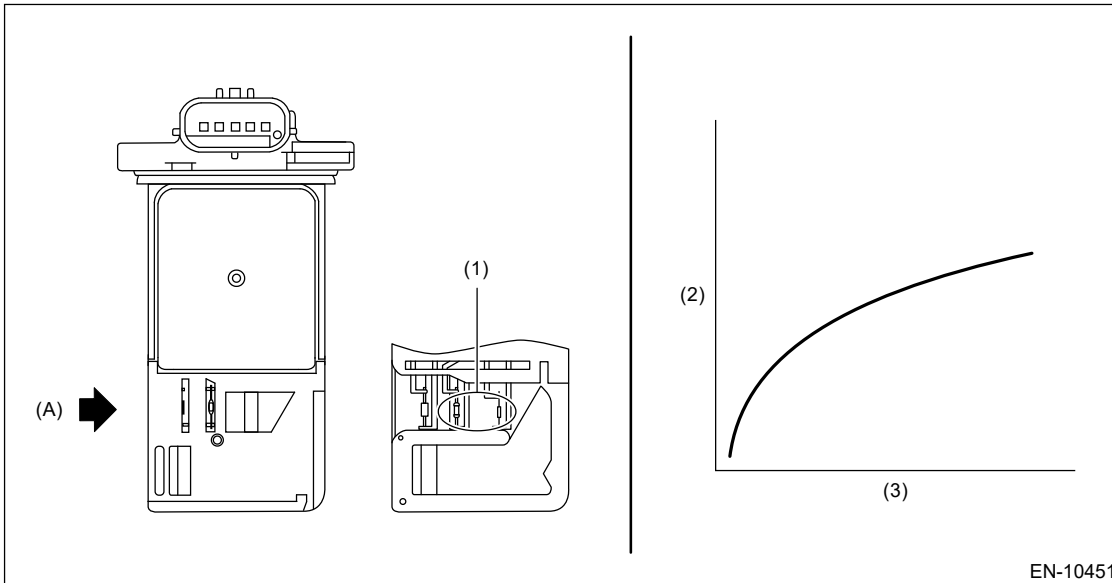
Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect open or short circuits of the air flow sensor.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-10451

(A) Air

(1) Air flow sensor

(2) Voltage (V)

(3) Intake air amount (g (oz))/s

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Elapsed time after ignition switch is turned to ON	≥ 1040 ms

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	< 0.12 V

Time needed for diagnosis: 520 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0103 MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT HIGH



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

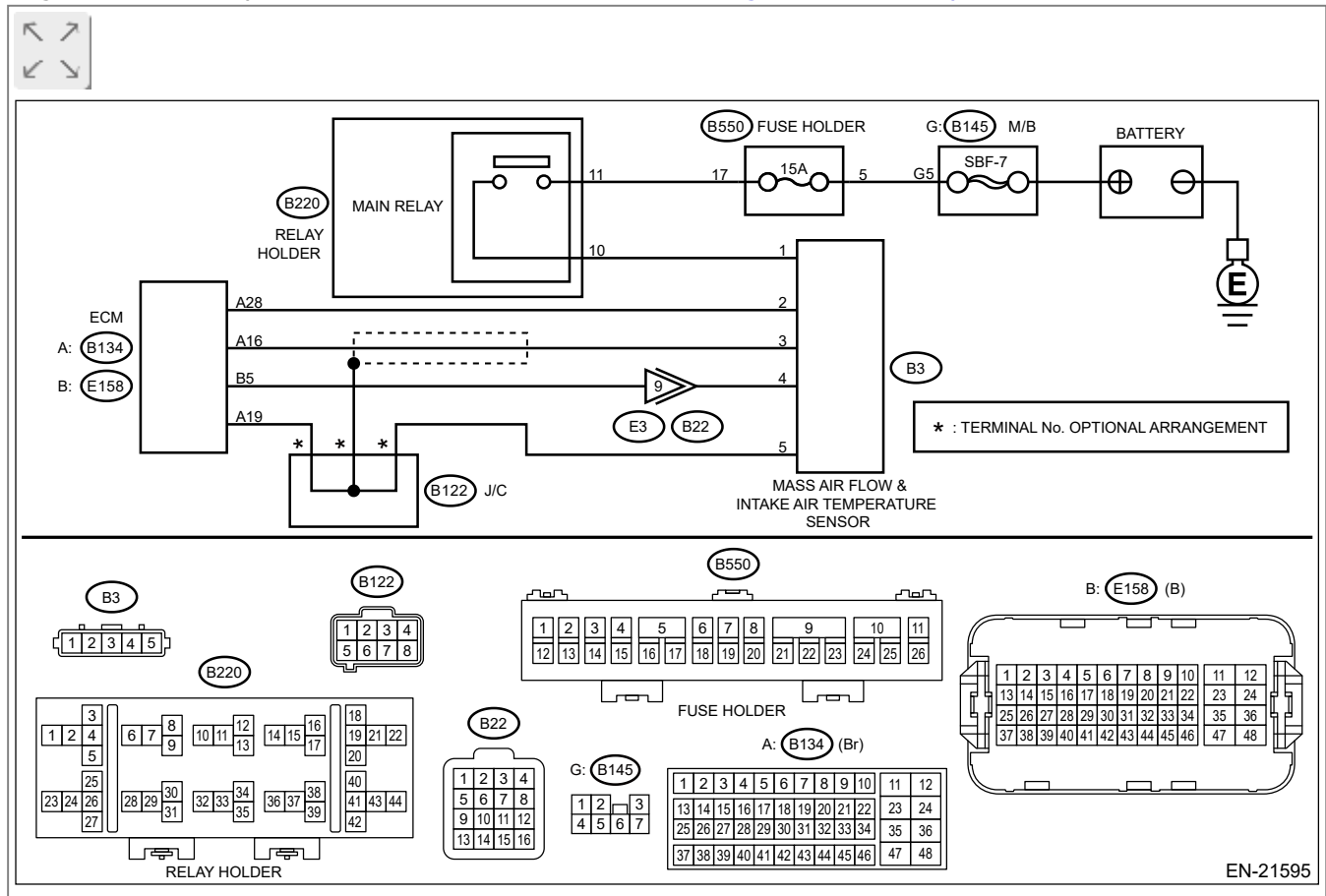
- Improper idling
- Engine stalls.
- Poor driving performance

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:


Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK CURRENT DATA.


1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Air Flow Sensor Voltage].

Note:

For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

Is the value of [Air Flow Sensor Voltage] 5 V or more?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.


Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the mass air flow and intake air temperature sensor.
3. Start the engine.
4. Using the Subaru Select Monitor, read the value in [Air Flow Sensor Voltage].

Note:

For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

Is the value of [Air Flow Sensor Voltage] 5 V or more?

Yes

Repair the short circuit of harness to power supply between ECM and mass air flow and intake air temperature sensor connector.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between mass air flow and intake air temperature sensor connector and engine ground.

Connector & terminal

(B3) No. 2 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and mass air flow and intake air temperature sensor connector**
- **Poor contact of ECM connector**

4. CHECK FOR POOR CONTACT.


Check for poor contact of mass air flow and intake air temperature sensor connector.

Is there poor contact of mass air flow and intake air temperature sensor connector?

Yes

Repair the poor contact of mass air flow and intake air temperature sensor connector.

No

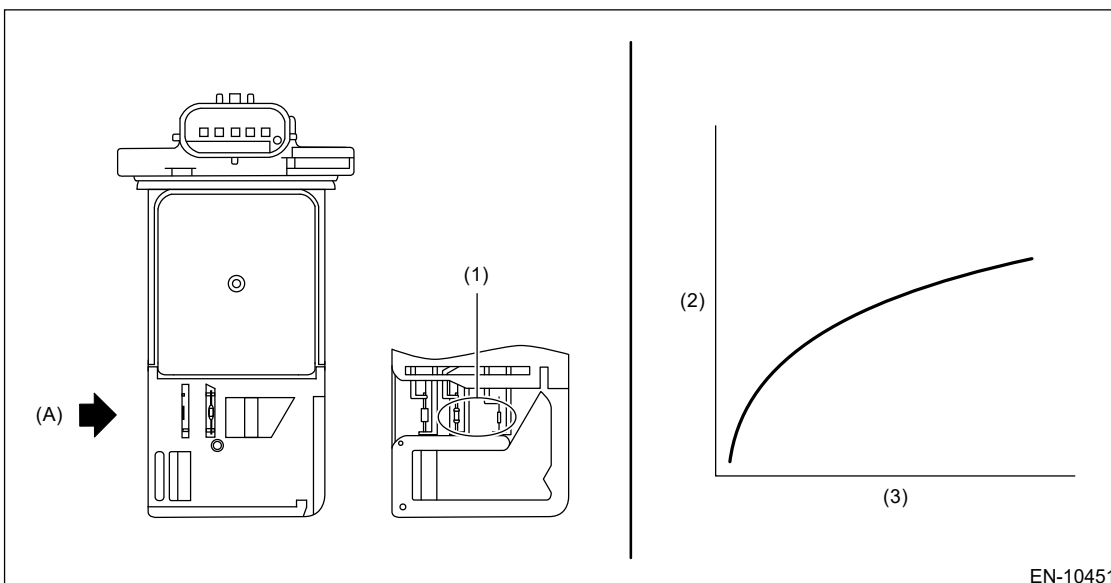
Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect open or short circuits of the air flow sensor.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-10451

(A) Air

(1) Air flow sensor

(2) Voltage (V)

(3) Intake air amount (g (oz)/s)

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Elapsed time after ignition switch is turned to ON	≥ 1040 ms

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	> 4.79 V

Time needed for diagnosis: 520 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0107 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT LOW

DTC detecting condition:

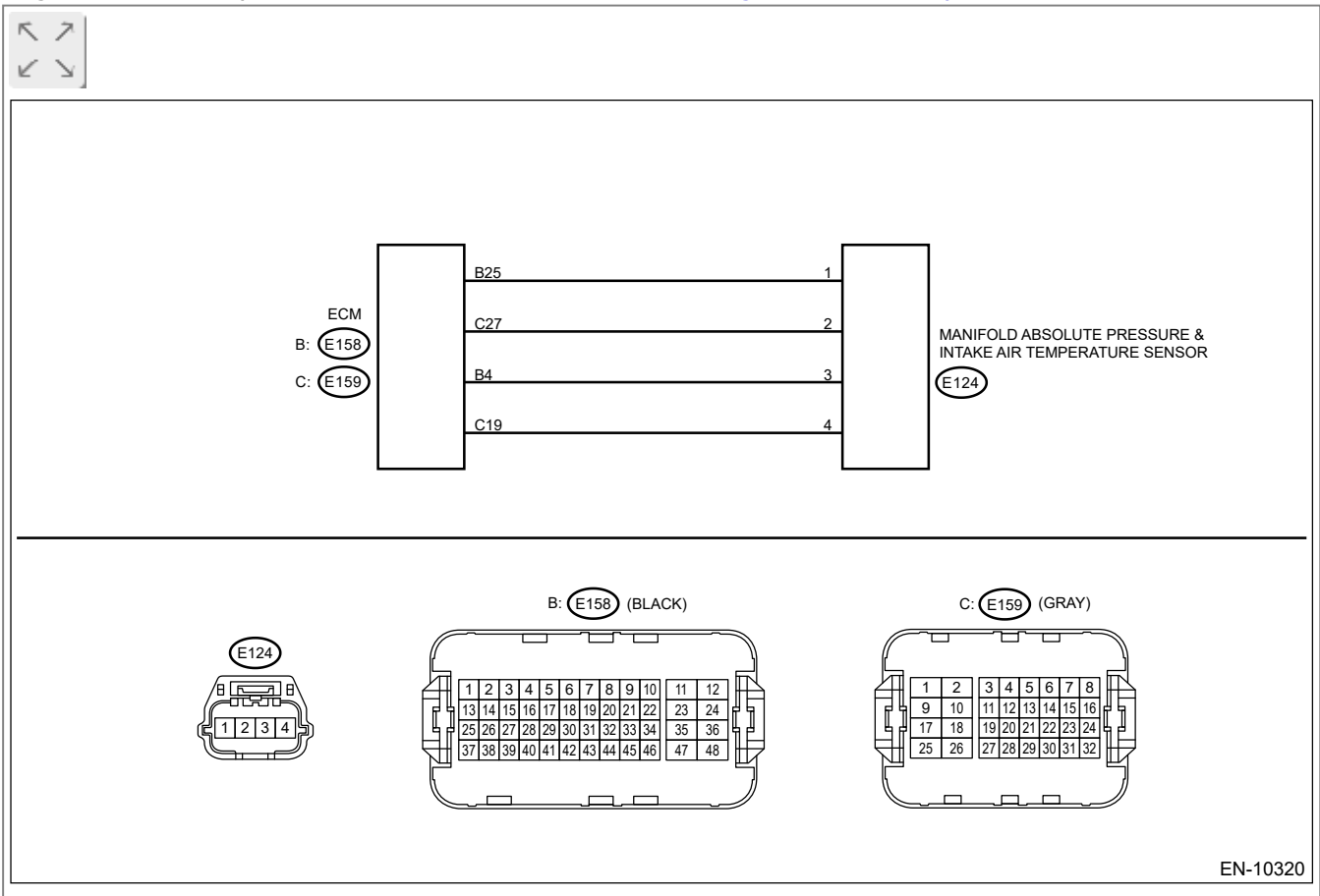
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.




EN-10320

1. CHECK CURRENT DATA.

1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Mani. Absolute Pressure].

Note:


- Subaru Select Monitor

For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

- **General scan tool**

For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Mani. Absolute Pressure] less than 13.3 kPa (100 mmHg, 3.94 inHg)?

 [Go to 2.](#)

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK POWER SUPPLY OF MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the manifold absolute pressure and intake air temperature sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between the manifold absolute pressure and intake air temperature sensor connector and engine ground.

Connector & terminal

(E124) No. 4 (+) — Engine ground (-):

Is the voltage 4.5 V or more?

 [Go to 3.](#)

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and the manifold absolute pressure and intake air temperature sensor connector**
- **Poor contact of ECM connector**

3. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.

3. Measure the resistance of harness between ECM and the manifold absolute pressure and intake air temperature sensor connector.

Connector & terminal

(E158) No. 4 — (E124) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Repair the open circuit in harness between the manifold absolute pressure and intake air temperature sensor connector.

4. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.



Measure the resistance between ECM and engine ground.

Connector & terminal

(E158) No. 4 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM and manifold absolute pressure and intake air temperature sensor connector.

5. CHECK FOR POOR CONTACT.




Check for poor contact of ECM and manifold absolute pressure and intake air temperature sensor connector.

Is there poor contact of ECM or manifold absolute pressure and intake air temperature sensor connector?

Yes

Repair the poor contact of ECM or manifold absolute pressure and intake air temperature sensor connector.

No

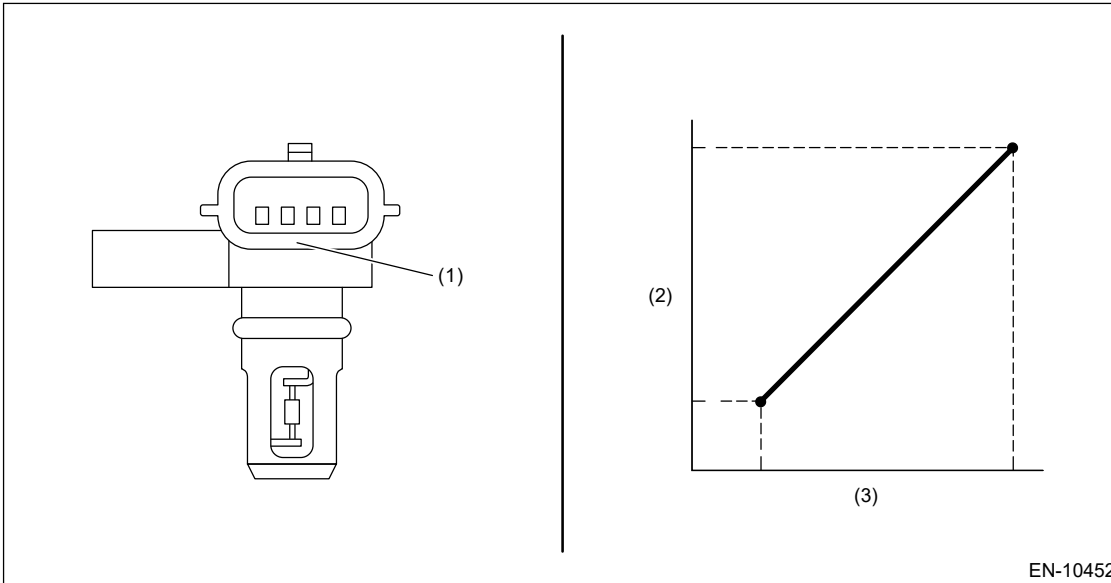
Replace the manifold absolute pressure and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Manifold Absolute Pressure and Intake Air Temperature Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of manifold absolute pressure sensor.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Manifold absolute pressure sensor

(2) Voltage (V)

(3) Absolute pressure (kPa)

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	< 0.34 V

Time needed for diagnosis: 2000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0108 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT HIGH

DTC detecting condition:

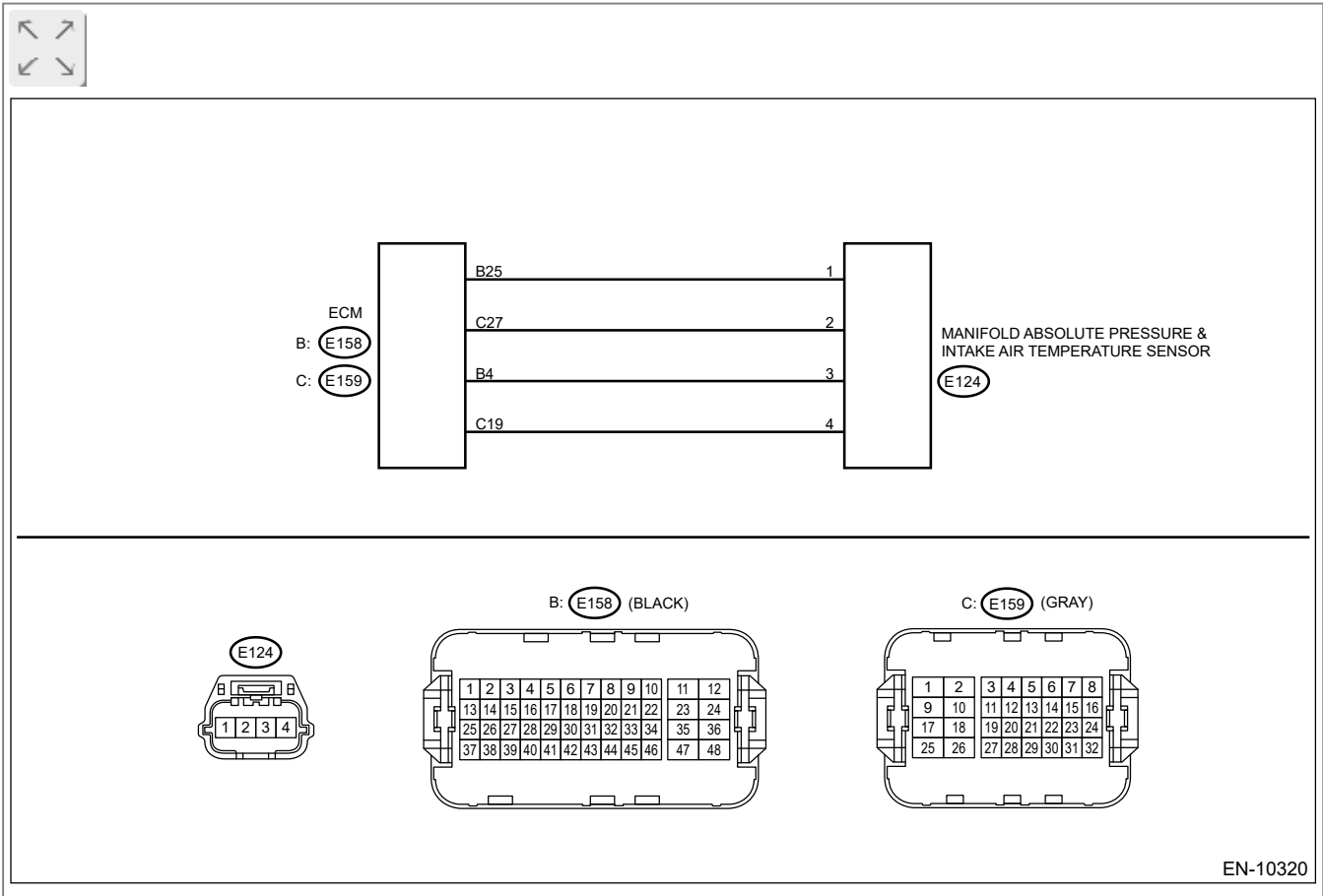
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



EN-10320

1. CHECK CURRENT DATA.

1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Mani. Absolute Pressure].

Note:

- Subaru Select Monitor


For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

- **General scan tool**

For detailed operation procedures, refer to the general scan tool operation manual.

Is the value in [Mani. Absolute Pressure] 256 kPa (1920.2 mmHg, 75.6 inHg) or more?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the manifold absolute pressure and intake air temperature sensor.
3. Start the engine.
4. Using the Subaru Select Monitor or a general scan tool, read the value of [Mani. Absolute Pressure].

Note:

- **Subaru Select Monitor**

For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

- **General scan tool**

For detailed operation procedures, refer to the general scan tool operation manual.

Is the value in [Mani. Absolute Pressure] 256 kPa (1920.2 mmHg, 75.6 inHg) or more?

Yes

Repair the short circuit to power in harness between ECM and the manifold absolute pressure and intake air temperature sensor connector.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.


2. Measure the resistance of harness between manifold absolute pressure and intake air temperature sensor connector and engine ground.

Connector & terminal

(E124) No. 2 — Engine ground:

Is the resistance less than 5 Ω?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and the manifold absolute pressure and intake air temperature sensor connector**
- **Poor contact of ECM connector**

4. CHECK FOR POOR CONTACT.




Check for poor contact of the manifold absolute pressure and intake air temperature sensor connector.

Is there poor contact of the manifold absolute pressure and intake air temperature sensor connector?

Yes

Repair the poor contact of the manifold absolute pressure and intake air temperature sensor connector.

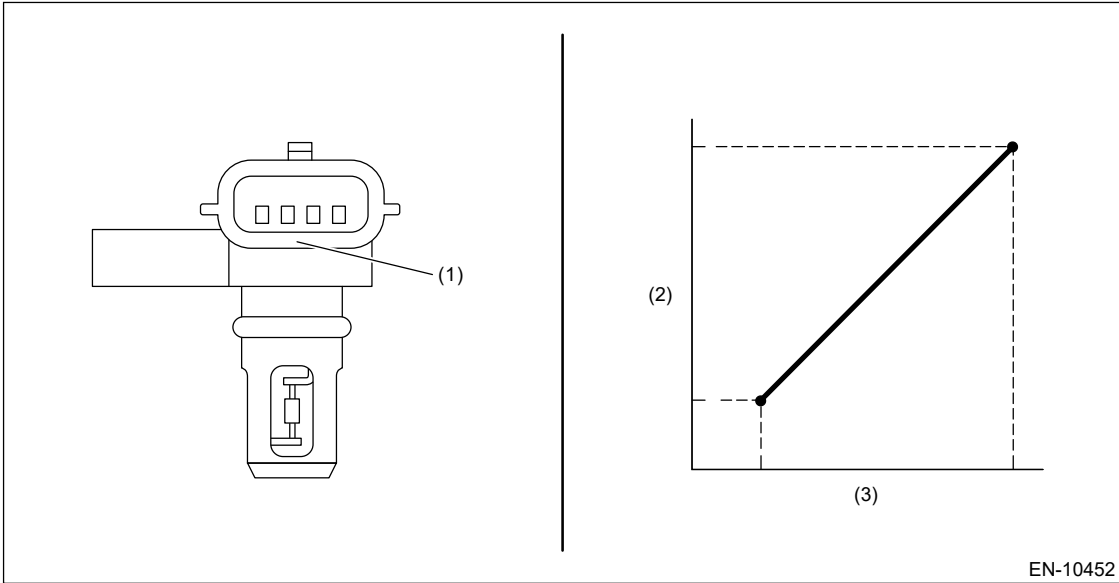
No

Replace the manifold absolute pressure and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Manifold Absolute Pressure and Intake Air Temperature Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of manifold absolute pressure sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Manifold absolute pressure sensor

(2) Voltage (V)

(3) Absolute pressure (kPa)

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	> 4.85 V

Time needed for diagnosis: 2000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0111 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE BANK 1



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Improper idling
- Poor driving performance


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..


1. CHECK FOR ANY OTHER DTC ON DISPLAY. 

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>List of Diagnostic Trouble Code (DTC).


No

 Go to 2.

2. CHECK CURRENT DATA. 

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Intake Air Temperature (B1-S1)].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Subaru Select Monitor.
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

3. Read the change of the value in Intake Air Temperature (B1-S1) while heating and cooling the mass air flow and intake air temperature sensor using a hair dryer.

Caution:


Do not heat the part to the temperature where you cannot touch it with your bare hand in order to prevent burning yourself and protect the part.

Does the value of [Intake Air Temperature (B1-S1)] change between heating and cooling?

Yes

Repair the poor contact of ECM connector.

No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

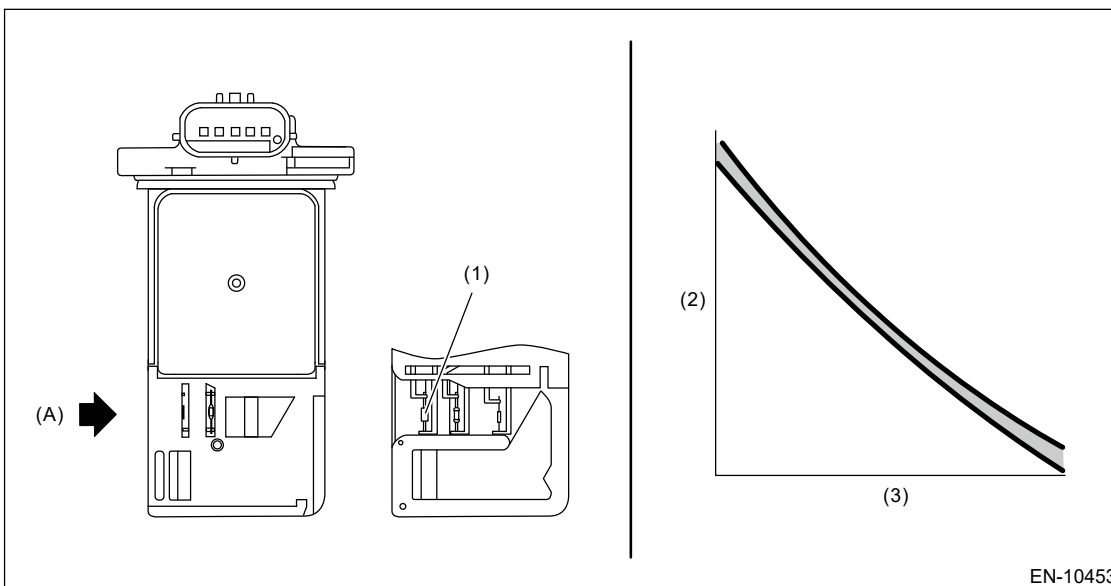
1. OUTLINE OF DIAGNOSIS

Detect the malfunction of the intake air temperature sensor (integrated with air flow sensor) output properties. Using the following two diagnoses, judge as NG when either is NG.

- **Diagnosis 1 (correlation diagnosis):** After the engine starts after the specified period of soaking time has elapsed, diagnose by correlation between intake air temperature sensor value, engine coolant temperature sensor value and ambient temperature sensor value. Judge as NG when the differences are both above the specified value by comparing between intake air temperature and engine coolant temperature, intake air temperature and ambient air temperature.
- **Diagnosis 2 (stuck diagnosis):** Judge as NG when intake air temperature does not change under the driving condition where it should change, considering engine condition.

2. COMPONENT DESCRIPTION

Intake air temperature sensor (integrated with air flow sensor)



(A) Air

(1) Intake air temperature sensor

(2) Resistance value (Ω)

(3) Intake air temperature $^{\circ}\text{C}$ ($^{\circ}\text{F}$)

3. EXECUTION CONDITION

Diagnosis 1

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$

Soaking time	≥ 21600 s
Block heater judgment	Completed
Block heater operation	Not in operation

Diagnosis 2

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Engine coolant temperature	≥ 60°C (140°F)
Integrated value of intake air amount	≥ 5,500 g
Number of experiences under following driving conditions	≥ 3 times
• Duration of driving condition 1	≥ 10 s
Vehicle speed and	≥ 40 km/h (24.9 MPH)
Amount of intake air	≥ 10 g/s
• Duration of driving condition 2	≥ 15 s
Vehicle speed	< 4 km/h (2.5 MPH)

4. GENERAL DRIVING CYCLE

- **Diagnosis 1:** Perform the diagnosis only once after the engine starts after a certain period of soaking time.
- **Diagnosis 2:** Perform the diagnosis when the vehicle speed condition is met after warming up from a cold condition.

5. DIAGNOSTIC METHOD

Judge as NG when Diagnosis 1 or Diagnosis 2 becomes NG.

Diagnosis 1

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Intake air temperature (air flow sensor) 30 sec. after engine start – Engine coolant temperature at engine start	> Value of Map 1
Intake air temperature (air flow sensor) 30 sec. after engine start – Ambient air temperature 30 sec. after engine start	> Value of Map 2

Map 1

--	--	--	--	--

Ambient temperature °C (°F)	-30 (-22)	30 (86)	45 (113)	60 (140)
Intake air temperature (air flow sensor) 30 sec. after engine start – Engine coolant temperature at engine start °C (°F)	12 (21.6)	12 (21.6)	22 (39.6)	22 (39.6)

Map 2

Ambient temperature °C (°F)	-30 (-22)	30 (86)	45 (113)	60 (140)
Intake air temperature (air flow sensor) 30 sec. after engine start – Ambient air temperature 30 sec. after engine start °C (°F)	20 (36)	20 (36)	32 (57.6)	32 (57.6)

Time needed for diagnosis: Less than 1 second

Diagnosis 2

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage difference between Max. and Min.	< 0.02 V (Equivalent to approximately 0.5°C (0.9°F) near 25°C (77°F))

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0112 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW BANK 1



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

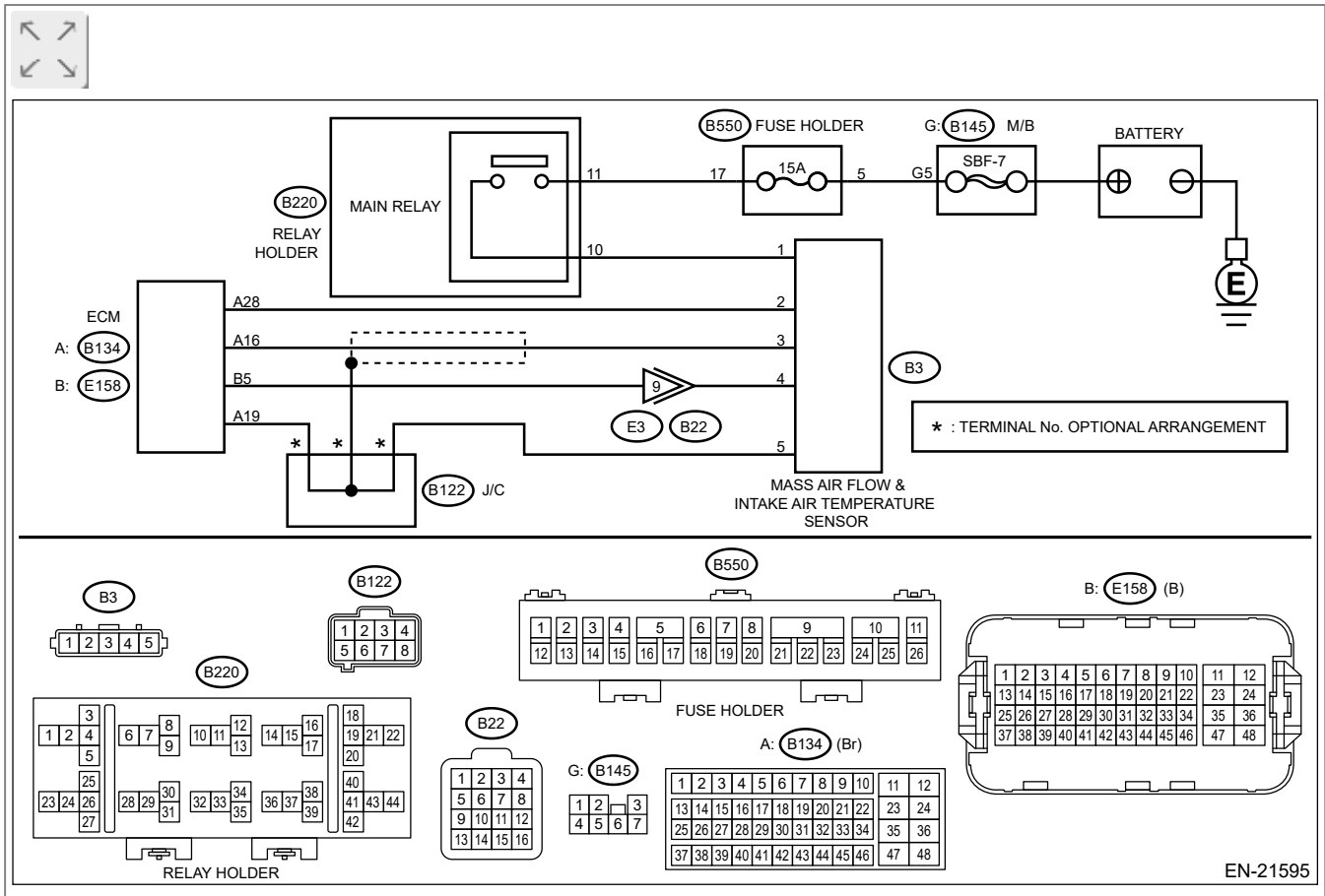
- Improper idling
- Poor driving performance

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:


Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK CURRENT DATA.


1. Start the engine.
2. Read the value of intake air temperature sensor #11 using the Subaru Select Monitor or a general scan tool.

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value in intake air temperature sensor #11 120°C (248°F) or more?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the mass air flow and intake air temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM and engine ground.

Connector & terminal

(E158) No. 5 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

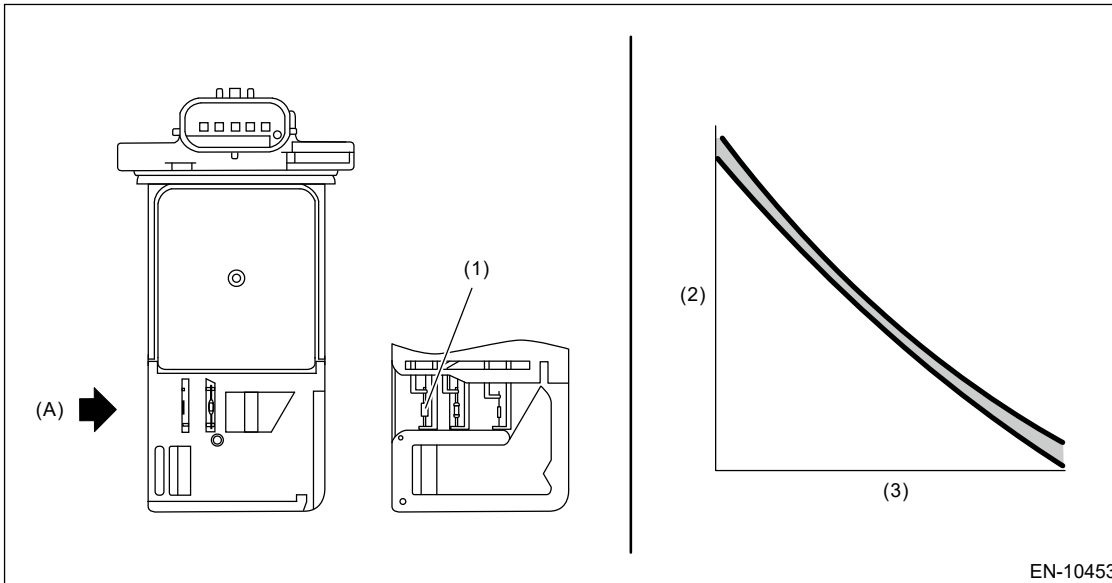
No

Repair the short circuit to ground in harness between ECM and mass air flow and intake air temperature sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of the intake air temperature sensor (integrated with air flow sensor).
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-10453

(A) Air

(1) Intake air temperature sensor

(2) Resistance value (Ω)

(3) Intake air temperature $^{\circ}\text{C}$ ($^{\circ}\text{F}$)

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	< 0.22 V

Time needed for diagnosis: 520 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0113 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH BANK 1



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

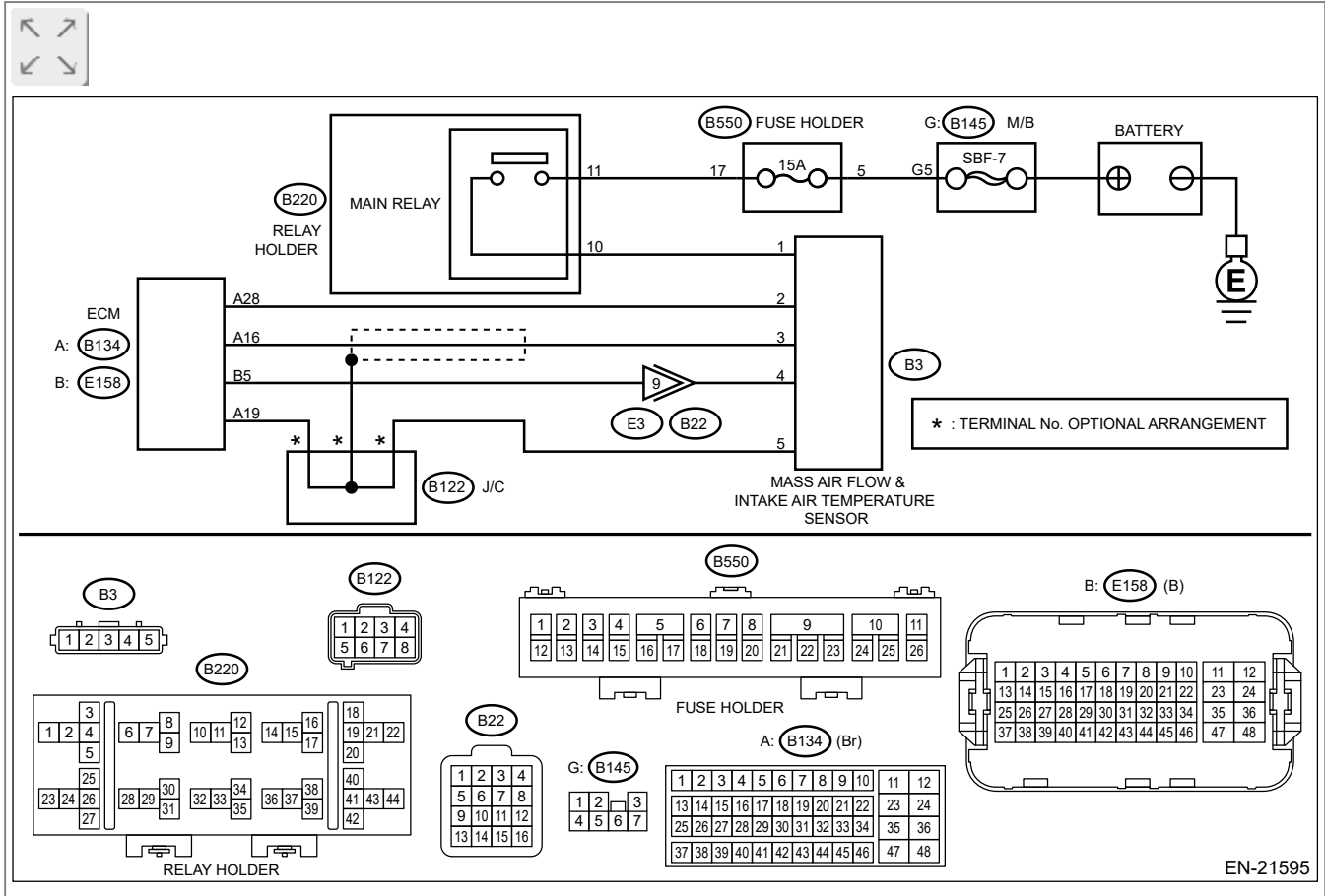
- Improper idling
- Poor driving performance

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.




1. CHECK CURRENT DATA.




1. Start the engine.
2. Read the value of intake air temperature sensor #11 using the Subaru Select Monitor or a general scan tool.

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value in intake air temperature sensor #11 less than -40°C (-40°F)?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM and mass air flow and intake air temperature sensor connector.

Is there poor contact of ECM or mass air flow and intake air temperature sensor connector?

Yes

Repair the poor contact of ECM or mass air flow and intake air temperature sensor connector.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the mass air flow and intake air temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and the mass air flow and intake air temperature sensor connector.

Connector & terminal

(E158) No. 5 — (B3) No. 4:

(B134) No. 19 — (B3) No. 5:

Is the resistance less than $1\ \Omega$?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and mass air flow and intake air temperature sensor connector**
- **Poor contact of coupling connector**

4. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.



1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM and engine ground.

Connector & terminal


(E158) No. 5 (+) — Engine ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit of harness to power supply between ECM and mass air flow and intake air temperature sensor connector.

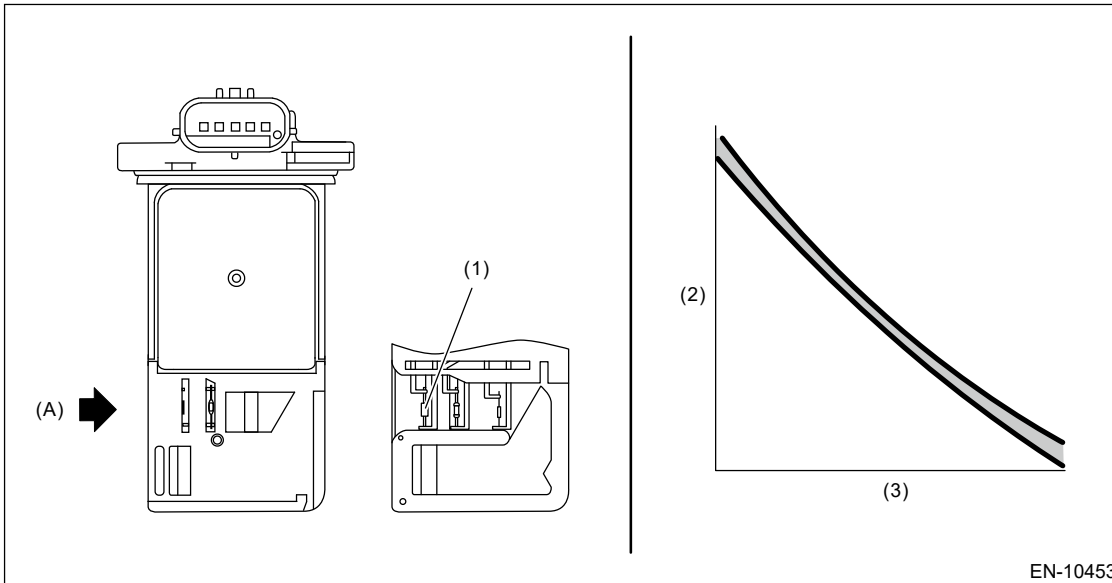
No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of the intake air temperature sensor (integrated with air flow sensor).
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-10453

(A) Air

(1) Intake air temperature sensor

(2) Resistance value (Ω)

(3) Intake air temperature $^{\circ}\text{C}$ ($^{\circ}\text{F}$)

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	> 4.72 V

Time needed for diagnosis: 520 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0116 ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Hard to start
- Improper idling
- Poor driving performance

Caution:


After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode>OPERATION.](#) and Inspection Mode  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode>PROCEDURE.](#)

1. CHECK FOR ANY OTHER DTC ON DISPLAY. 


Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".

 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 2.](#)

2. CHECK ENGINE COOLANT TEMPERATURE SENSOR. 

1. Disconnect the connectors from the engine coolant temperature sensor.
2. Measure the resistance between engine coolant temperature sensor terminals when the engine coolant is cold and after warmed up.

Terminals


No. 1 — No. 2:

Is the resistance of engine coolant temperature sensor different between when engine coolant is cold and after warmed up?

Yes

Repair the poor contact of ECM connector.

No

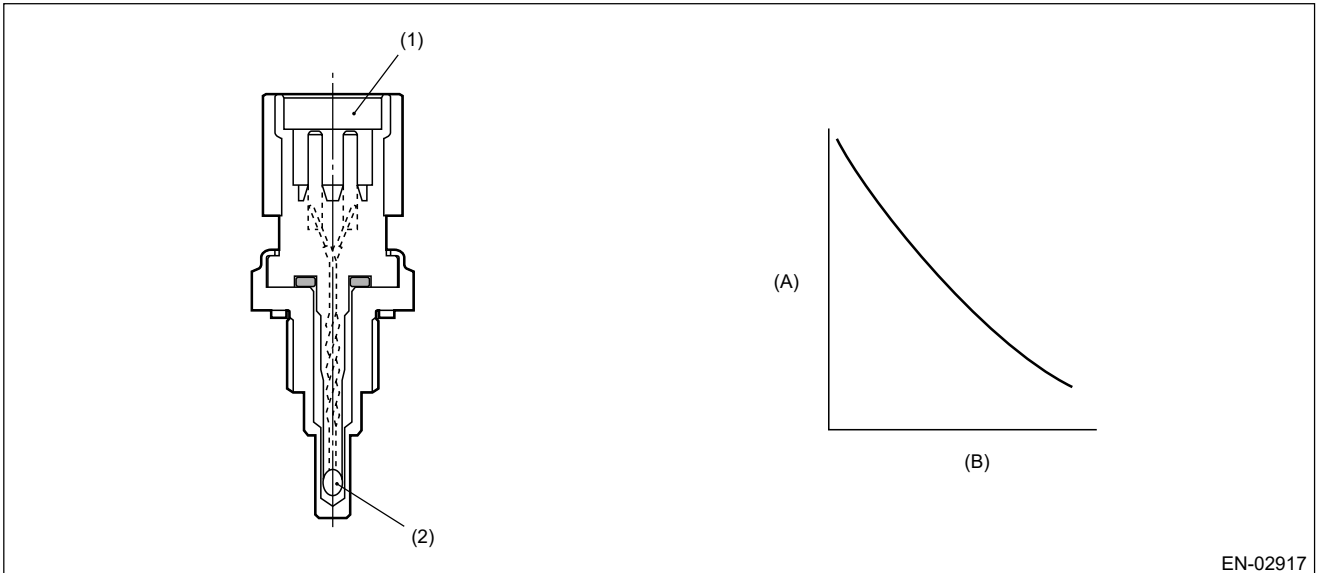
Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Coolant Temperature Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of the engine coolant temperature sensor characteristics.

After the engine starts after the specified period of soaking time has elapsed, diagnose by correlation between engine coolant temperature sensor value, intake air temperature sensor value and ambient temperature sensor value. Judge as NG when the differences are both above the specified value by comparing between engine coolant temperature and ambient air temperature, engine coolant temperature and intake air temperature.

2. COMPONENT DESCRIPTION



(A) Resistance value (kΩ)

(B) Temperature °C (°F)

(1) Connector

(2) Thermistor element

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Soaking time	≥ 21600 s
Block heater judgment	Completed
Block heater operation	Not in operation

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once after the engine starts after a certain period of soaking time.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Engine coolant temperature at engine start – Intake air	> Value from Map

temperature 30 sec. after engine start Engine coolant temperature at engine start – Ambient air temperature at engine start	> 25°C (45°F)
--	---------------

Map

Ambient temperature °C (°F)	–30 (–22)	30 (86)	45 (113)	60 (140)
Engine coolant temperature at engine start – Intake air temperature 30 sec. after engine start °C (°F)	12 (21.6)	12 (21.6)	22 (39.6)	22 (39.6)

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0117 ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT LOW



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

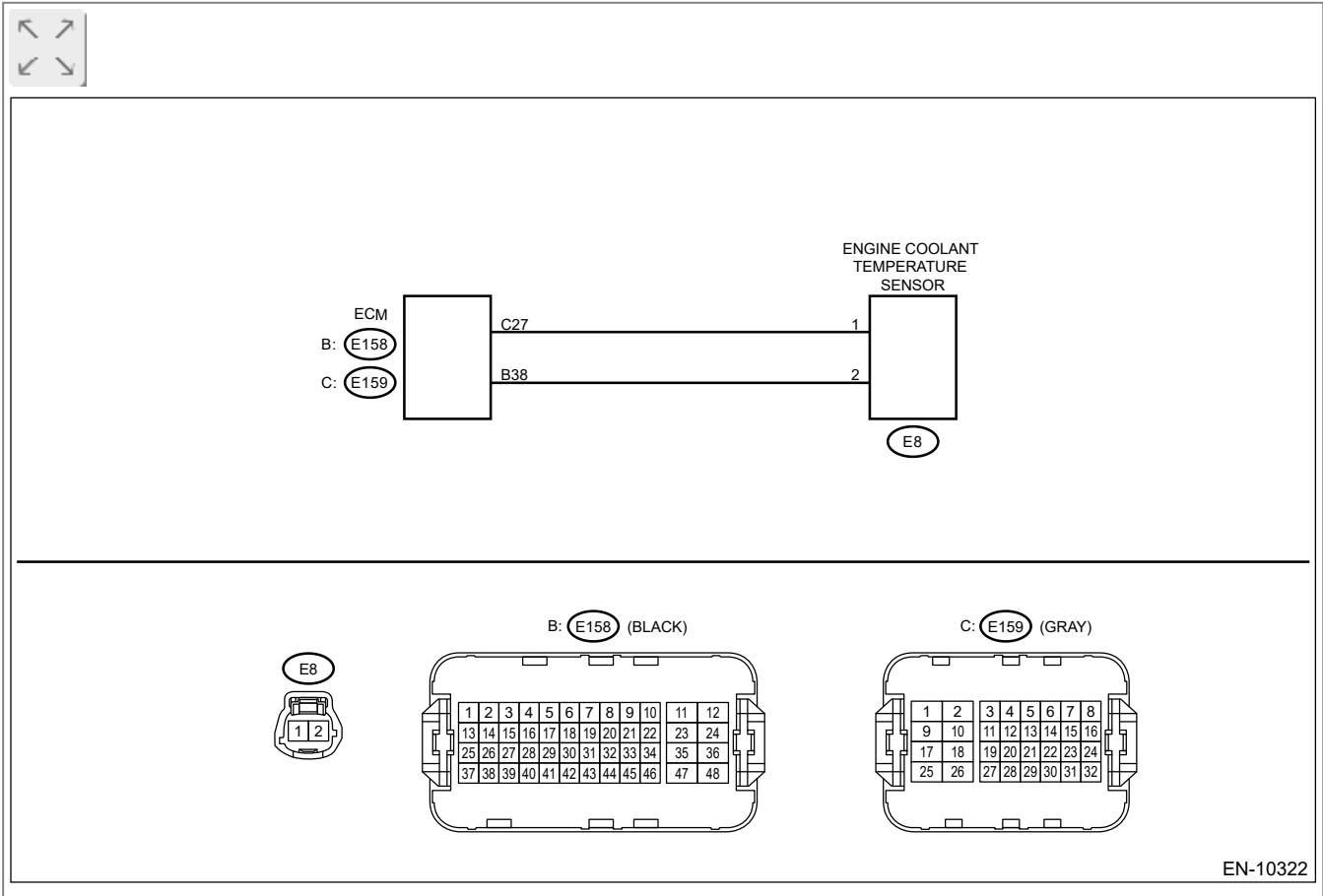
- Hard to start
- Improper idling
- Poor driving performance

Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.




EN-10322

1. CHECK CURRENT DATA.

1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Coolant Temp.].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Coolant Temp.] 150°C (302°F) or more?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the engine coolant temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM and engine ground.

Connector & terminal

(E158) No. 38 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Coolant Temperature Sensor.](#)

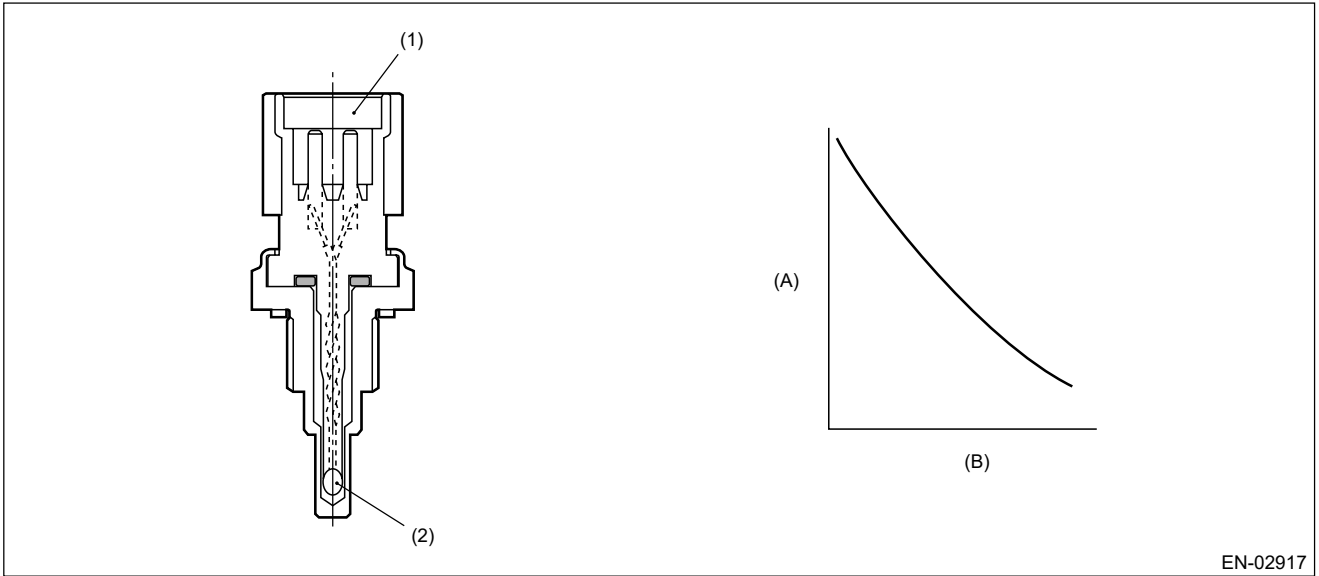
No

Repair short circuit in harness to ground between ECM and engine coolant temperature sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the engine coolant temperature sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-02917

(A) Resistance value (kΩ)

(B) Temperature °C (°F)

(1) Connector

(2) Thermistor element

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	< 0.33 V

Time needed for diagnosis: 500 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0118 ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT HIGH



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

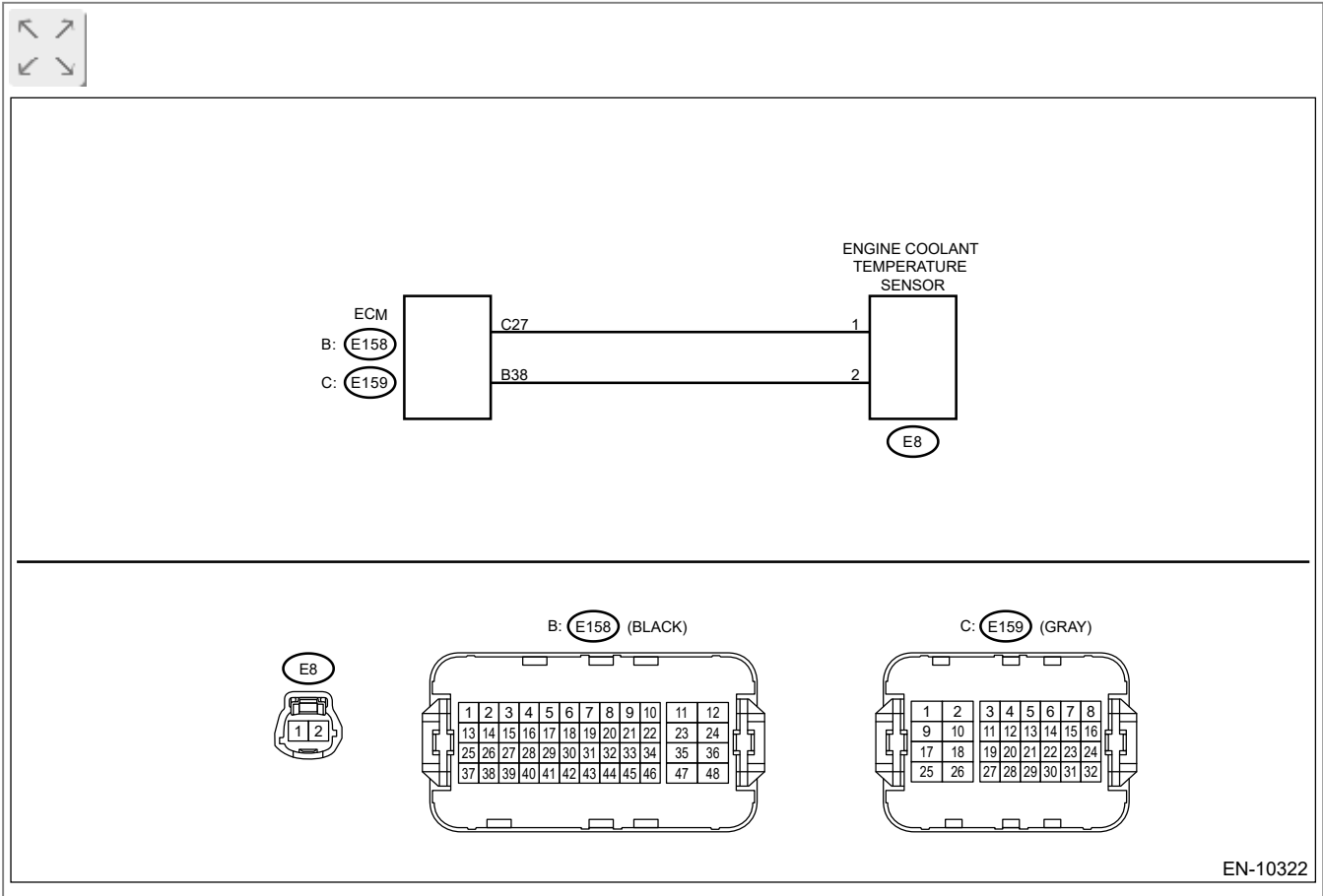
- Hard to start
- Improper idling
- Poor driving performance

Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:


Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK CURRENT DATA.


1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Coolant Temp.].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Coolant Temp.] less than -40°C (-40°F)?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM and engine coolant temperature sensor connector.

Is there poor contact of ECM or engine coolant temperature sensor connector?

Yes

Repair the poor contact of ECM or engine coolant temperature sensor connector.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the engine coolant temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and engine coolant temperature sensor connector.

Connector & terminal

(E159) No. 27 — (E8) No. 1:

(E158) No. 38 — (E8) No. 2:

Is the resistance less than $1\ \Omega$?

Yes

 [Go to 4.](#)

No

Repair the open circuit of harness between ECM and engine coolant temperature sensor connector.

4. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.



1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM and engine ground.

Connector & terminal


(E158) No. 38 (+) — Engine ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in harness between ECM and engine coolant temperature sensor connector.

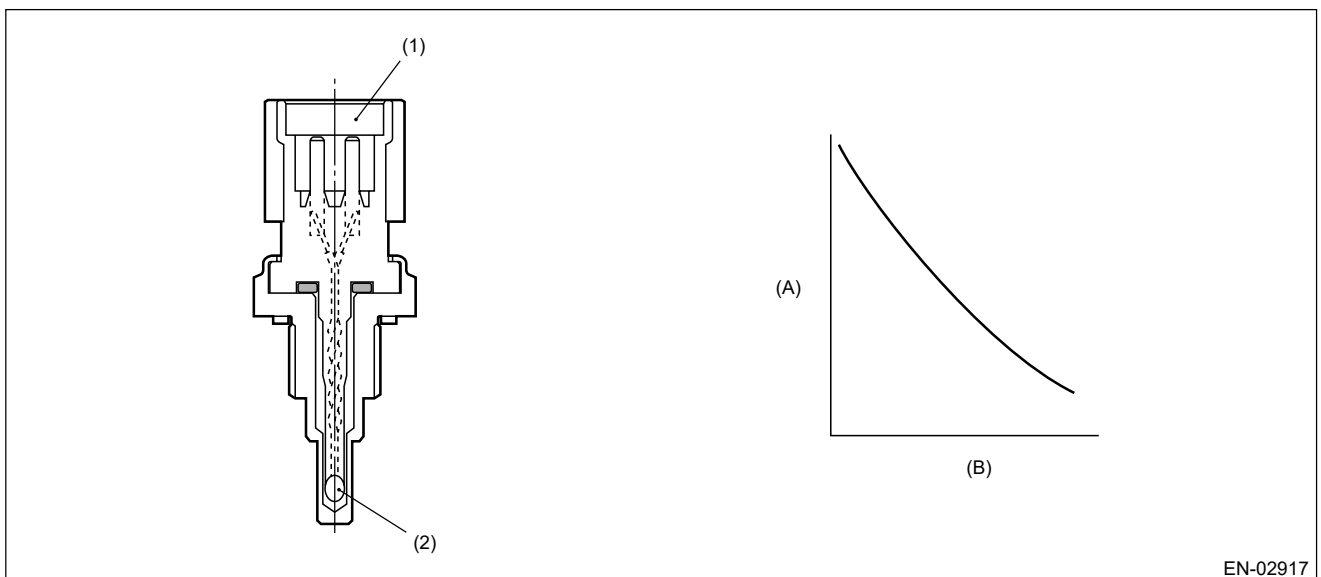
No

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Coolant Temperature Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the engine coolant temperature sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-02917

(A) Resistance value (k Ω)

(B) Temperature $^{\circ}\text{C}$ ($^{\circ}\text{F}$)

(1) Connector

(2) Thermistor element

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	> 4.71 V

Time needed for diagnosis: 500 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Engine stalls.
- Poor driving performance

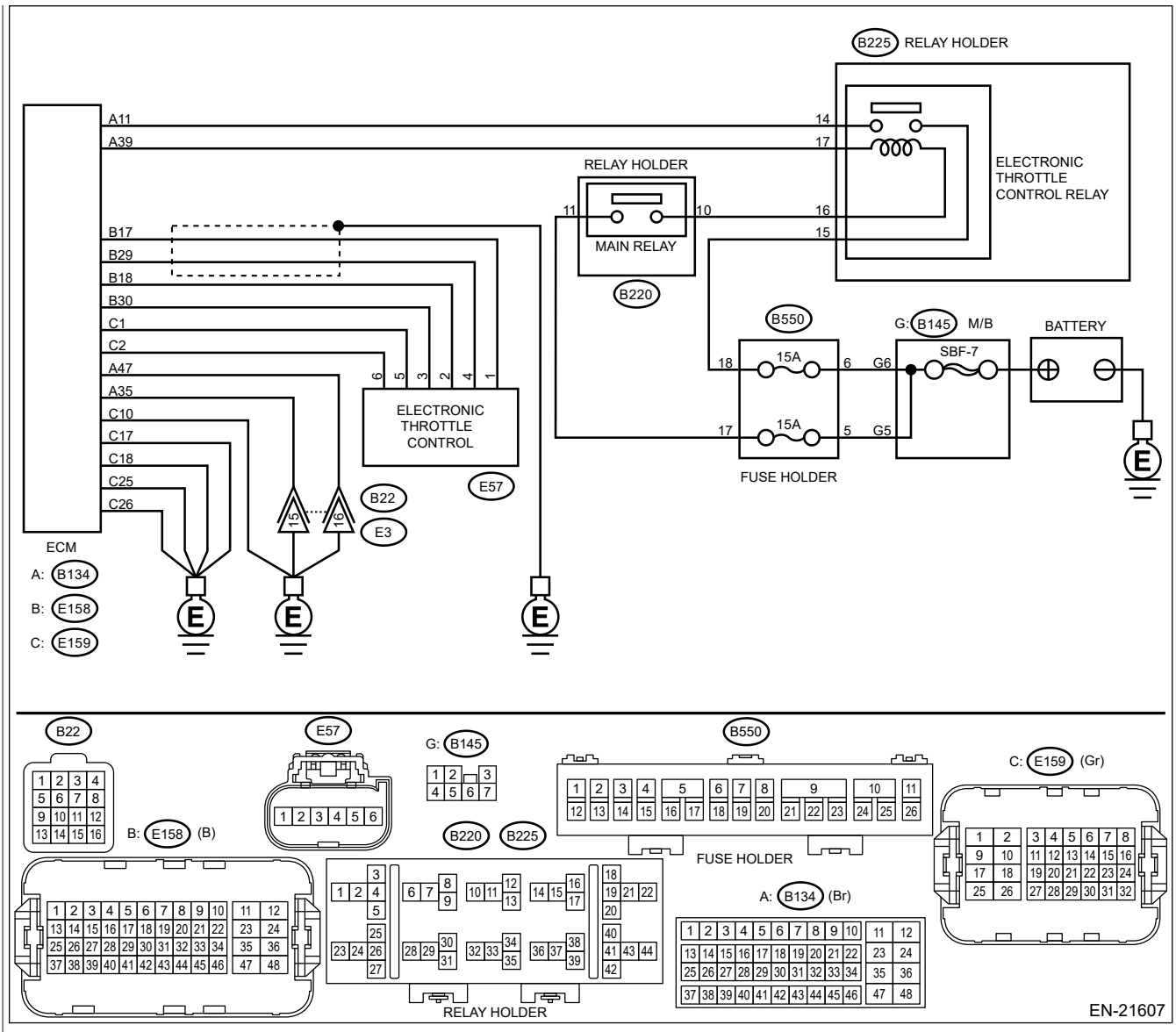
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21607

1. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connectors from electronic throttle control.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM and engine ground.

Connector & terminal

- (E158) No. 18 — Engine ground:
- (E158) No. 17 — Engine ground:
- (E158) No. 17 — (E158) No. 28:

Is the resistance 1 MΩ or more?

Yes

Go to 2.

No

Repair the short circuit to ground in harness between ECM and electronic throttle control connector.

2. CHECK SHORT CIRCUIT INSIDE THE ECM.



1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 1 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

Replace the electronic throttle control. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Throttle Body.](#)

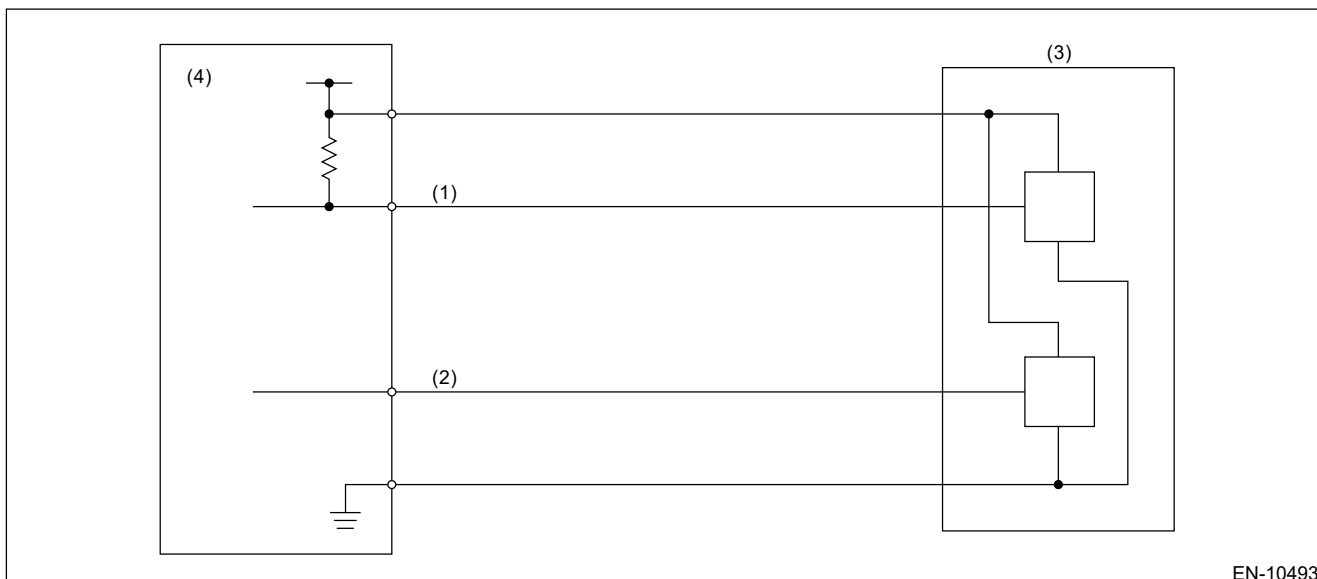
No

Repair the short circuit to ground in harness between ECM and electronic throttle control connector. Replace the ECM if defective. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of throttle position sensor 1.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-10493

(1) Throttle position sensor 1 signal

(3) Throttle position sensor

(4) Engine control module (ECM)

(2) Throttle position sensor 2 signal

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 6\text{ V}$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 1 input voltage	$< 0.29\text{ V}$

Time needed for diagnosis: 100 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Engine stalls.
- Poor driving performance

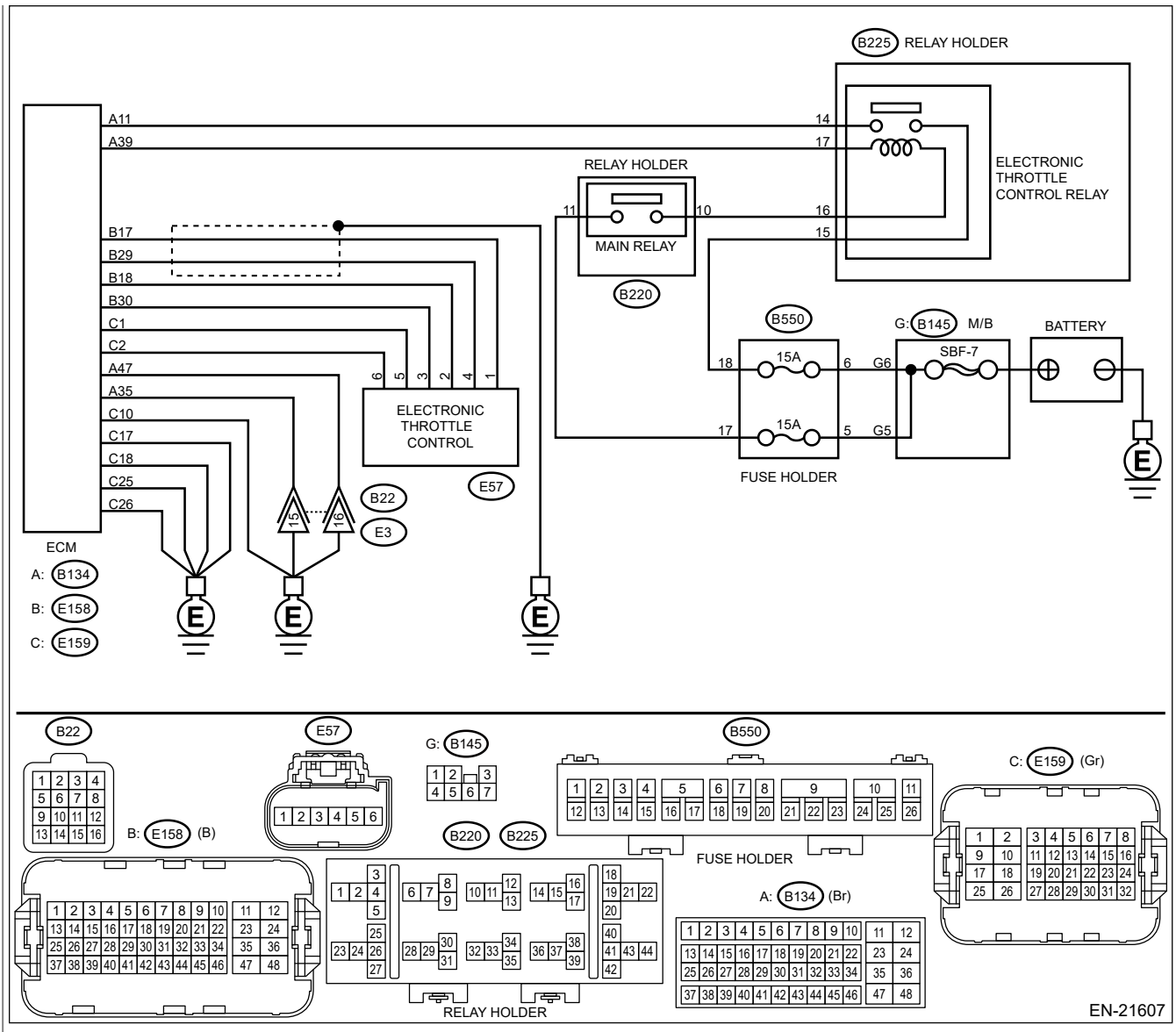
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





1. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from electronic throttle control.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and electronic throttle control connector.

Connector & terminal

- (E158) No. 17 — (E57) No. 1:
- (E158) No. 30 — (E57) No. 3:

Is the resistance less than 1 Ω ?

Yes

[Go to 2.](#)

No

Repair the open circuit of harness between ECM and electronic throttle control connector.

2. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.


1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 3 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM and engine ground**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to ON.
2. Measure the voltage between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 1 (+) — Engine ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in harness between ECM and electronic throttle control connector.

No

 [Go to 4.](#)

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.


3. Measure the resistance between ECM connectors.

Connector & terminal

(E158) No. 17 — (E158) No. 18:

Is the resistance 1 MΩ or more?

Yes

Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Throttle Body.](#)

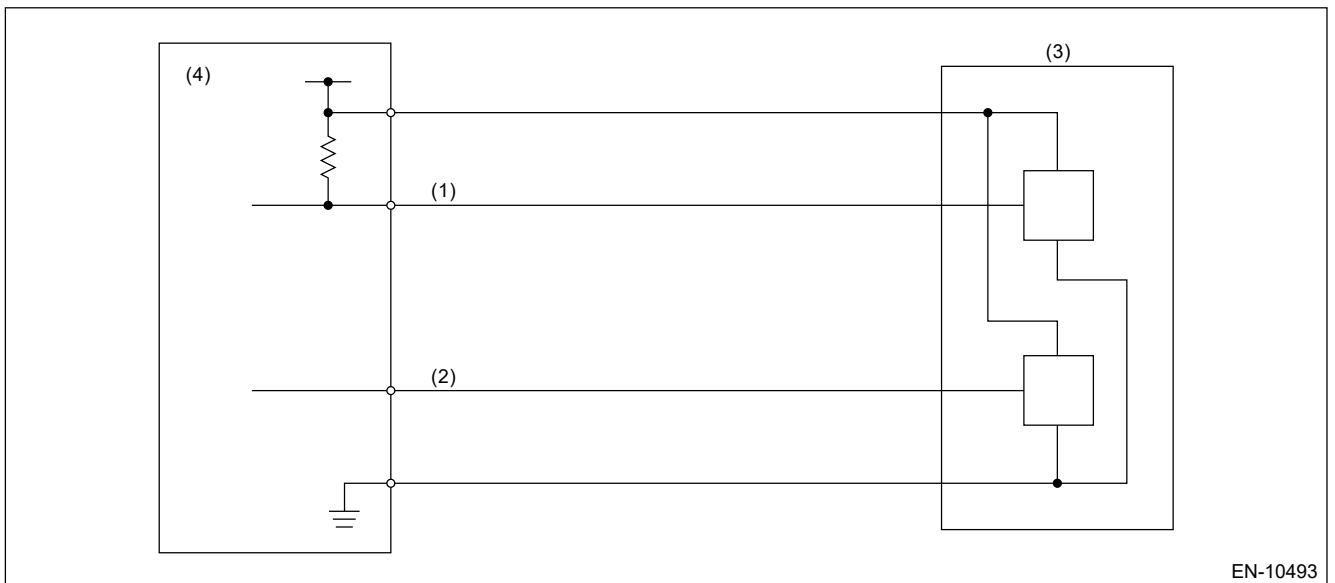
No

Repair the short circuit to power in harness between ECM and electronic throttle control connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of throttle position sensor 1.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Throttle position sensor 1 signal

(3) Throttle position sensor

(4) Engine control module (ECM)

(2) Throttle position sensor 2 signal

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 6 V

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 1 input voltage	> 4.69 V

Time needed for diagnosis: 100 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0125 INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

Engine does not return to idle.

Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..


1. CHECK ENGINE COOLANT.

Check the following items:


- Amount of engine coolant
- Engine coolant freeze
- Contamination of engine coolant

Is the engine coolant normal?

Yes

 [Go to 2.](#)

No

Fill or replace the engine coolant.  Ref. to COOLING(H4DOTC)>Engine Coolant>REPLACEMENT.


2. CHECK THERMOSTAT.

Does the thermostat remain opened?

Yes

Replace the thermostat.  Ref. to COOLING(H4DOTC)>Thermostat.

No

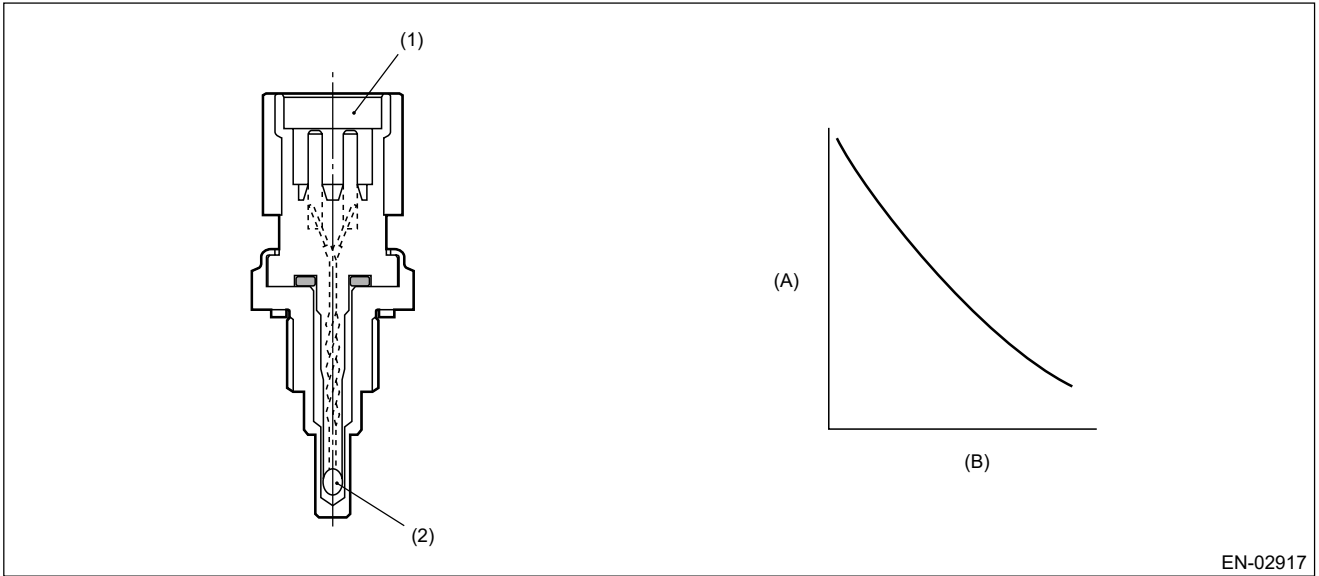
Replace the engine coolant temperature sensor.  Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Coolant Temperature Sensor.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of engine coolant temperature sensor output property.

Judge as NG when engine coolant temperature does not rise to the specified value after predetermined time has elapsed since engine start.

2. COMPONENT DESCRIPTION



- (A) Resistance value (kΩ) (B) Temperature °C (°F)
 (1) Connector (2) Thermistor element

EN-02917

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Engine speed	≥ 475 rpm
Engine coolant temperature at engine start	< -15°C (5°F)

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once after starting the engine from cold condition.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Engine coolant temperature	< -15°C (5°F)
Elapsed time after starting the engine	≥ 120 s
((Smaller value of either engine coolant temperature and intake air temperature at engine start) ≥ -23.3°C (-9.9°F))	
or	
Elapsed time after starting the engine	≥ 300 s

((Smaller value of either engine coolant temperature and intake air temperature at engine start) < -23.3°C (-9.9°F))	
---	--

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0130 A/F / O2 SENSOR CIRCUIT BANK 1 SENSOR 1

DTC detecting condition:

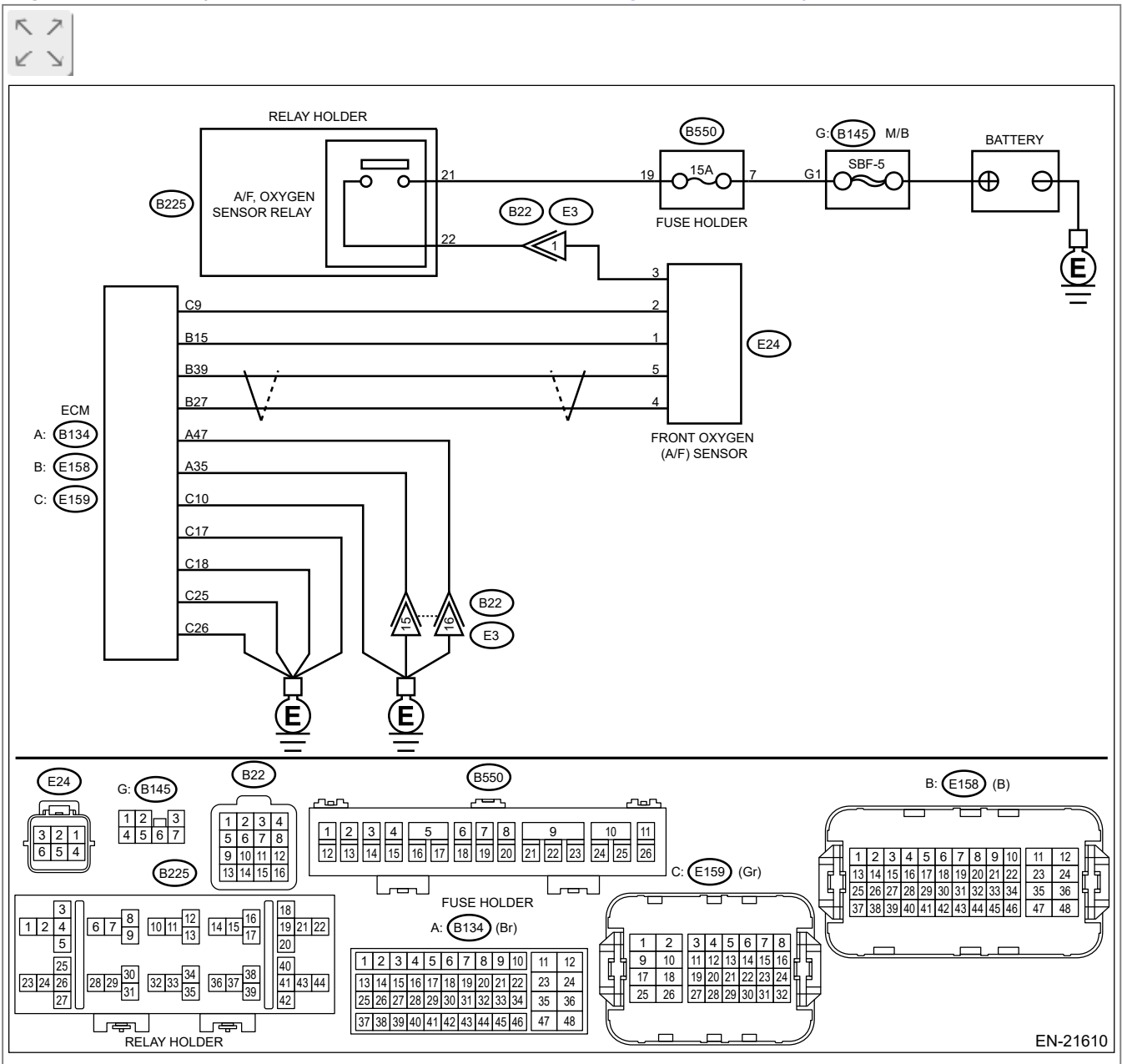
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:


Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK FRONT OXYGEN (A/F) SENSOR DATA.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. Idle the engine for one minute or more.
3. Read the value of A/F Sensor output lambda 1 using the Subaru Select Monitor or a general scan tool.

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of A/F sensor output lambda 1 1.20 — 3.00 V?

Yes

 [Go to 2.](#)

No

 [Go to 3.](#)

2. CHECK FRONT OXYGEN (A/F) SENSOR DATA.


1. Race the engine so that the engine speed stays at 3,000 rpm. (Five times in total)
2. Read the value of A/F Sensor output lambda 1 at racing using the Subaru Select Monitor or a general scan tool.

Note:

- **Slowly depress the accelerator pedal to increase engine speed up to 3,000 rpm, keep it for approximately 5 seconds, and quickly release the accelerator pedal to decrease engine speed.**
- **Normally, the air fuel ratio is rich during racing.**

Is the value of A/F sensor output lambda 1 2.5 V or more?

Yes

 [Go to 5.](#)

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.

2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.

Connector & terminal

- (E158) No. 15 — (E24) No. 1:
- (E158) No. 27 — (E24) No. 4:
- (E158) No. 39 — (E24) No. 5:

Is the resistance less than 1 Ω?

Yes

 [Go to 4.](#)

No

Repair the open circuit of harness between ECM and front oxygen (A/F) sensor connector.

4. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.


Measure the resistance between ECM and engine ground.

Connector & terminal

- (E158) No. 15 — Engine ground:
- (E158) No. 27 — Engine ground:
- (E158) No. 39 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 5.](#)

No

Repair the ground short circuit of harness between ECM and front oxygen (A/F) sensor connector.

5. CHECK EXHAUST SYSTEM.

Check exhaust system parts.

Note:

Check the following items.

- **Looseness and improper fitting of exhaust system parts**
- **Damage (crack, hole etc.) of parts**
- **Looseness of front oxygen (A/F) sensor**
- **Loose part and improper installation between front oxygen (A/F) sensor and rear oxygen sensor**


Is there any fault in exhaust system?



Yes

Repair or replace faulty parts.

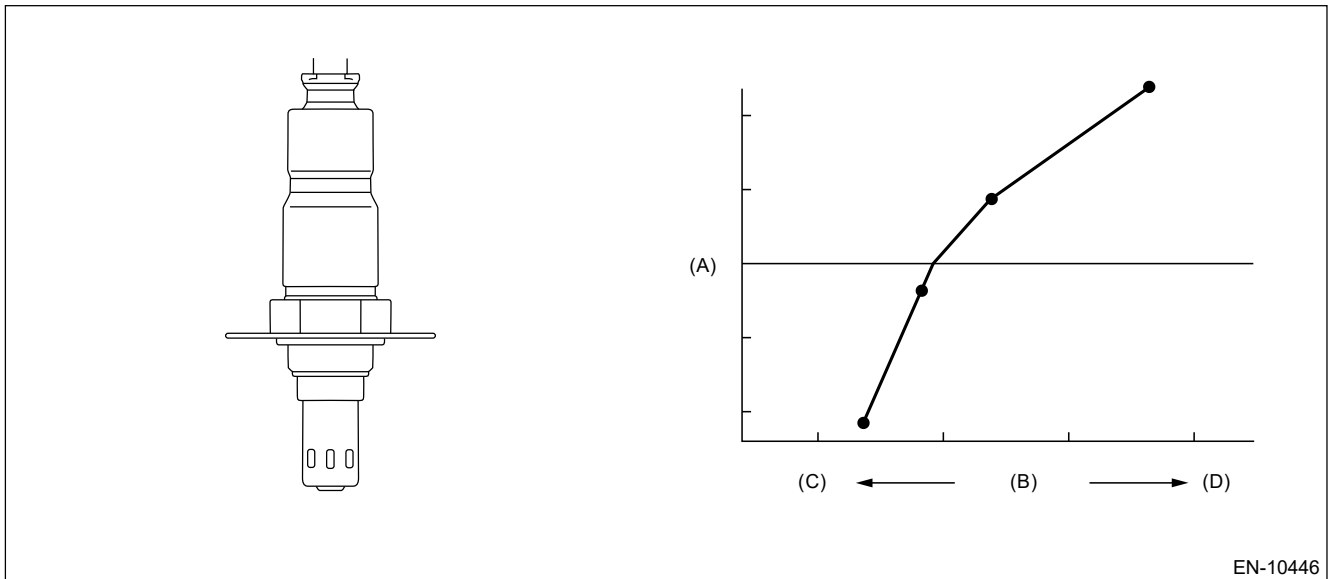
No

Replace the front oxygen (A/F) sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Front Oxygen \(A/F\) Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Judge as NG, while the element impedance is low with the element current out of the range.

2. COMPONENT DESCRIPTION



(A) Electromotive force

(B) Air fuel ratio

(C) Rich

(D) Lean

EN-10446

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Front oxygen (A/F) sensor impedance	$\leq 403 \ \Omega$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Input current	$< -45 \ \mu\text{A}$ or

| > 45 μ A |

Time needed for diagnosis: 3040 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0131 A/F / O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 1

DTC detecting condition:

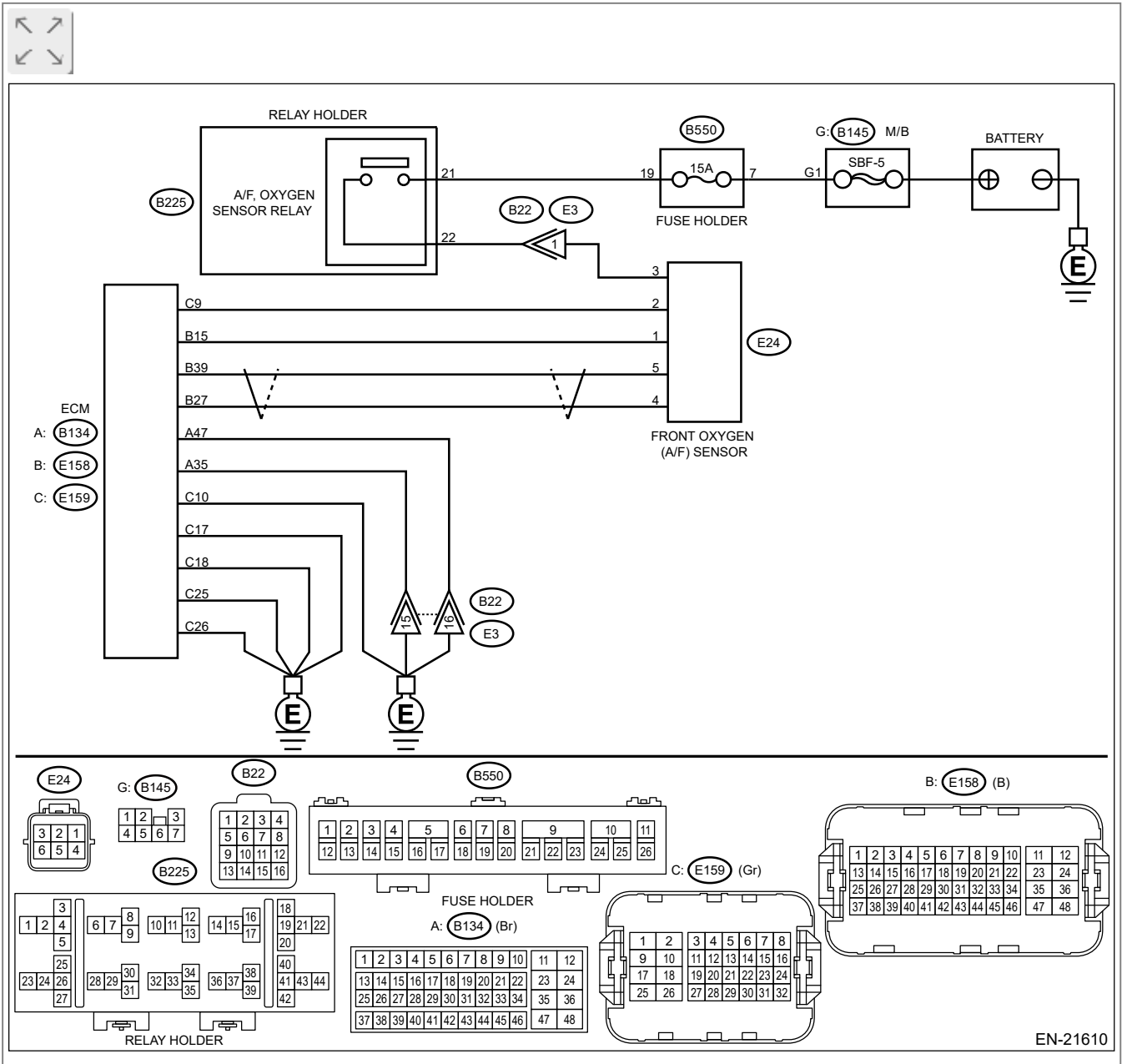
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)




1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR.

Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM and engine ground.

Connector & terminal

(E158) No. 15 — Engine ground:

(E158) No. 27 — Engine ground:

(E158) No. 39 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 3.](#)

No

Repair the ground short circuit of harness between ECM and front oxygen (A/F) sensor connector.

3. CHECK FOR POOR CONTACT.

Check for poor contact of the front oxygen (A/F) sensor connector.

Is there poor contact of front oxygen (A/F) sensor connector?

Yes

Repair the poor contact of front oxygen (A/F) sensor connector.

No

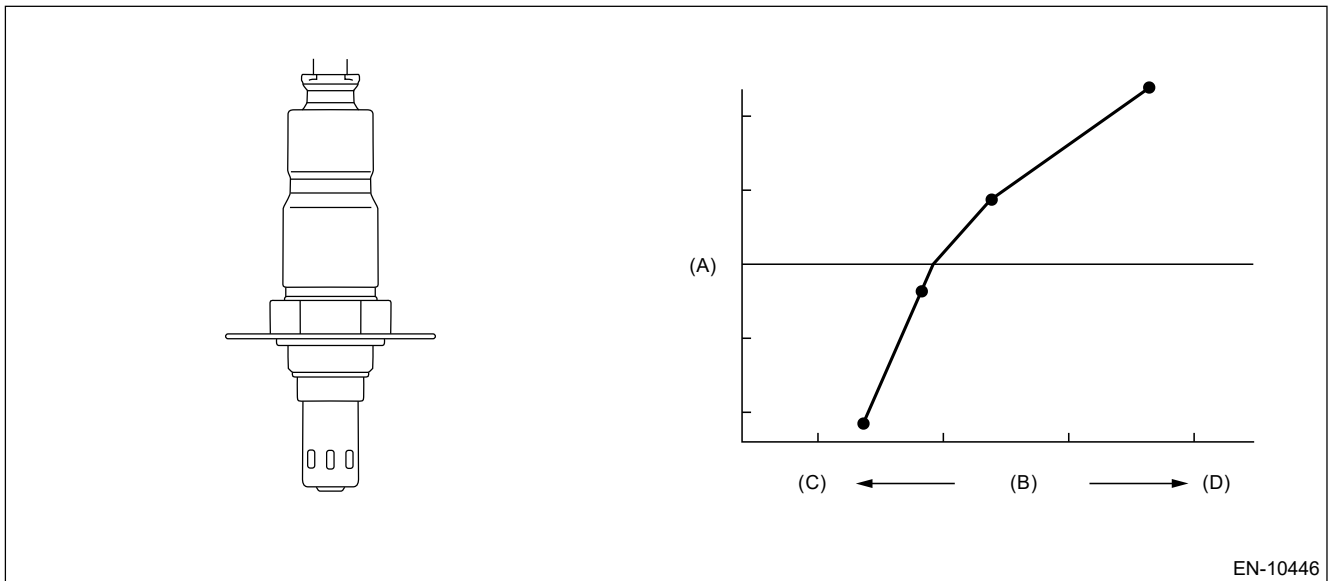
Replace the front oxygen (A/F) sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Front Oxygen \(A/F\) Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of sensor.

Judge as NG, when the element voltage is out of the specified range.

2. COMPONENT DESCRIPTION



(A) Electromotive force

(B) Air fuel ratio

(C) Rich

(D) Lean

EN-10446

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Input voltage (+)	$\leq 1 \text{ V}$
or	
Input voltage (-)	$\leq 1 \text{ V}$
or	
Sensor reference voltage	$\leq 1 \text{ V}$

Time needed for diagnosis: 560 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0132 A/F / O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 1

DTC detecting condition:

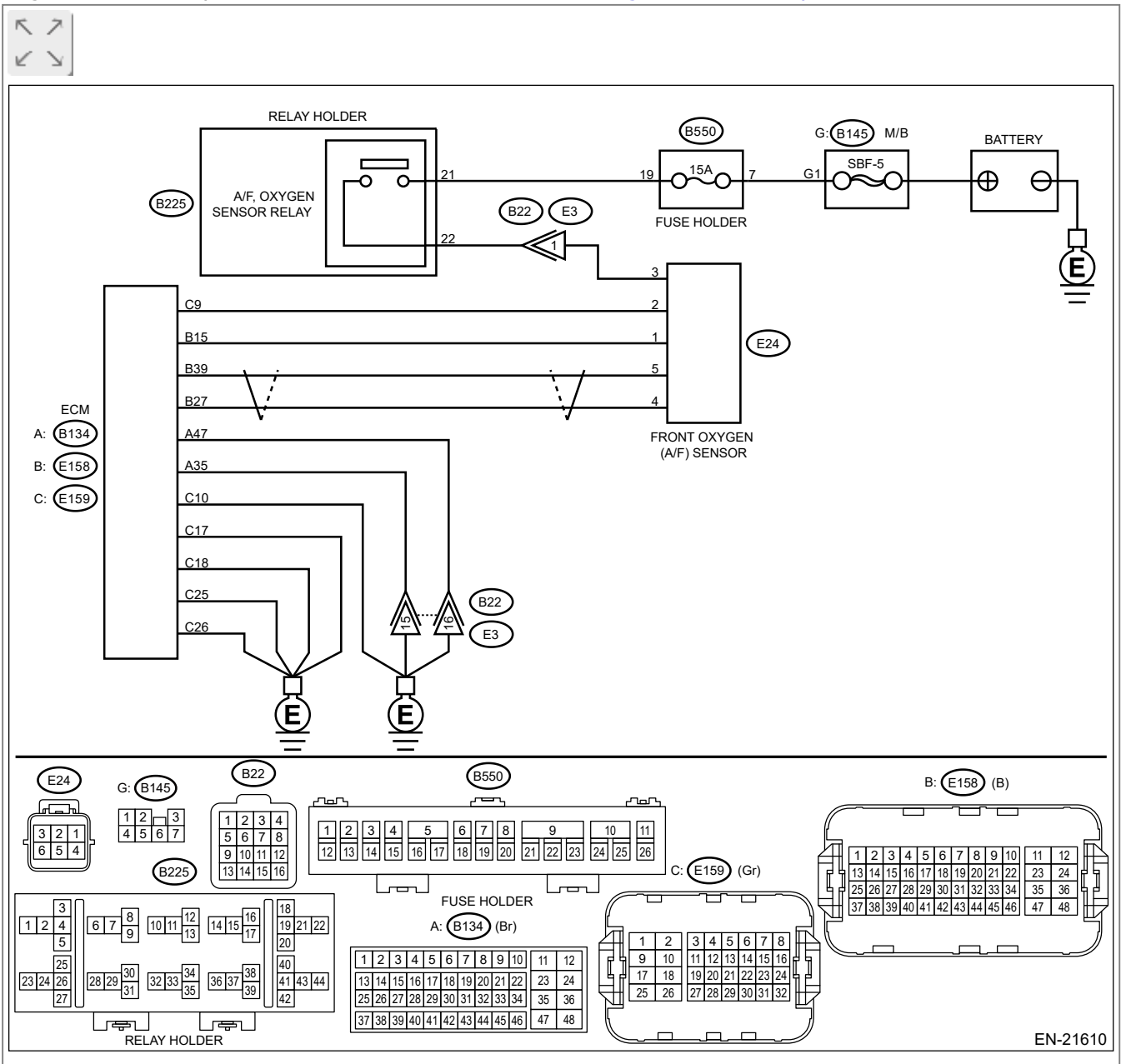
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.




1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR.

Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between ECM and engine ground.

Connector & terminal

(E158) No. 15 (+) — Engine ground (–):

(E158) No. 27 (+) — Engine ground (–):

(E158) No. 39 (+) — Engine ground (–):

Is the voltage 8 V or more?

Yes

Repair the short circuit to power in the harness between ECM and front oxygen (A/F) sensor connector.

No

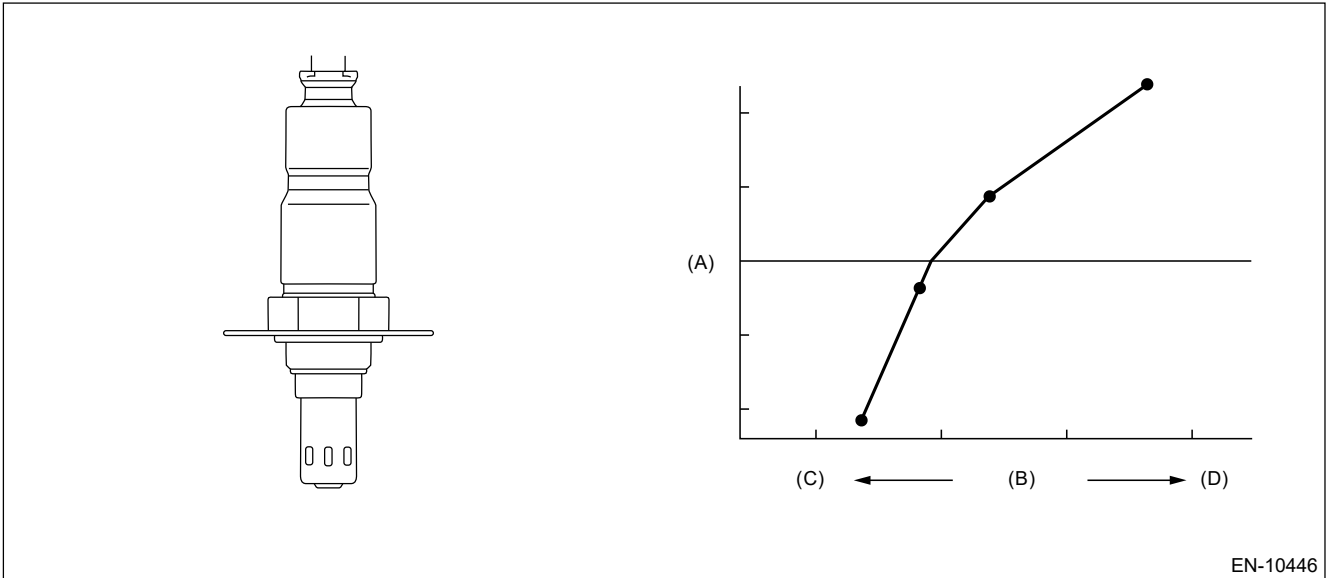
Replace the front oxygen (A/F) sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Front Oxygen \(A/F\) Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of sensor.

Judge as NG, when the element voltage is out of the specified range.

2. COMPONENT DESCRIPTION



(A) Electromotive force
(D) Lean

(B) Air fuel ratio

(C) Rich

EN-10446

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Input voltage (+) or Input voltage (-) or Sensor reference voltage	$\geq \text{Battery voltage} - 1 \text{ V}$ $\geq \text{Battery voltage} - 1 \text{ V}$ $\geq 6.5 \text{ V}$

Time needed for diagnosis: 560 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0134 A/F / O2 SENSOR CIRCUIT NO ACTIVITY DETECTED BANK 1 SENSOR 1

DTC detecting condition:

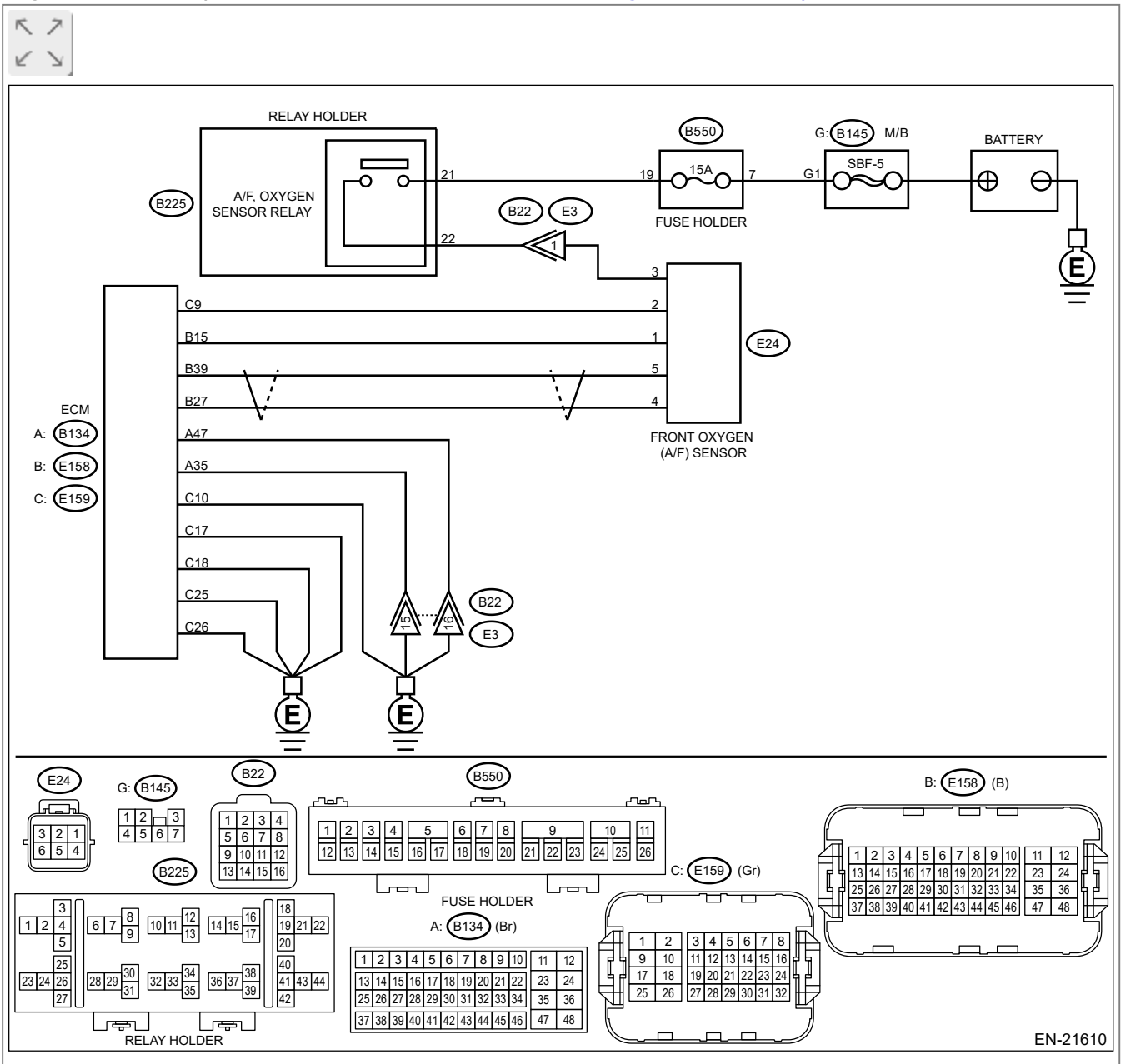
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and front oxygen sensor connector.

Connector & terminal

(E158) No. 15 — (E24) No. 1:

(E158) No. 27 — (E24) No. 4:

(E158) No. 39 — (E24) No. 5:

Is the resistance less than 1 Ω ?

Yes

 [Go to 2.](#)

No

Repair the open circuit of harness between ECM and front oxygen (A/F) sensor connector.

2. CHECK FOR POOR CONTACT.




Check for poor contact of ECM and front oxygen (A/F) sensor connector.

Is there poor contact of ECM or front oxygen (A/F) sensor connector?

Yes

Repair the poor contact of ECM or front oxygen (A/F) sensor connector.

No

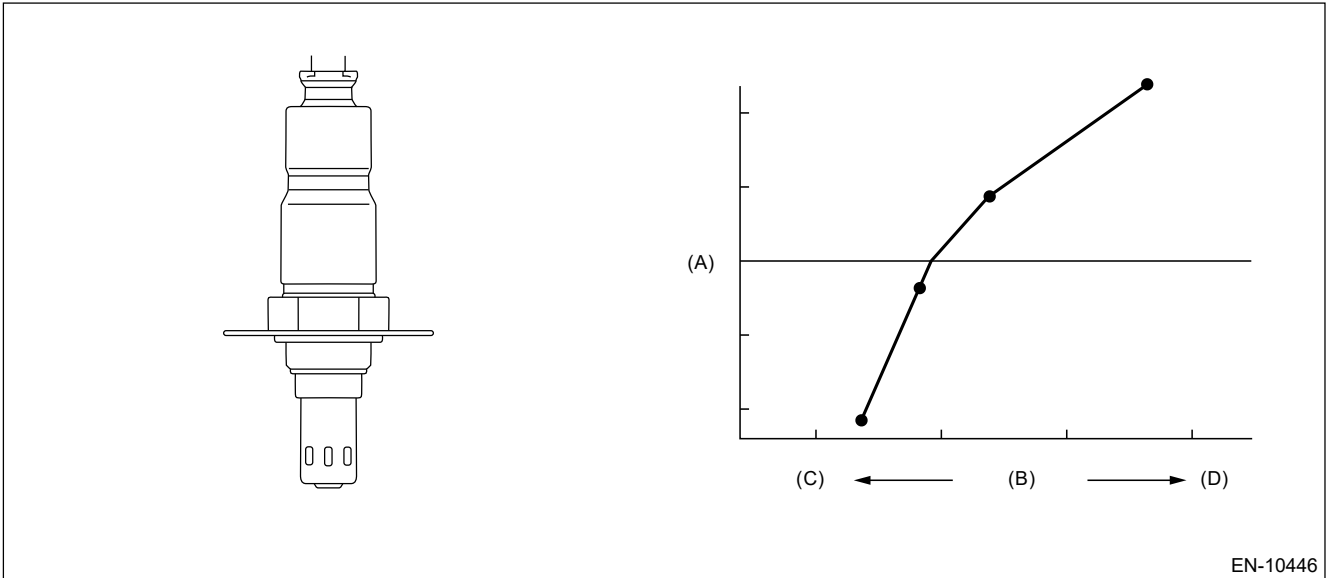
Replace the front oxygen (A/F) sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Front Oxygen \(A/F\) Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect open circuits of the sensor.

Judge as NG when the element voltage is out of range, or the element current is stuck.

2. COMPONENT DESCRIPTION



(A) Electromotive force

(B) Air fuel ratio

(C) Rich

(D) Lean

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
<When out of range, the malfunction signal is received>	$> 403 \Omega$
Front oxygen (A/F) sensor impedance	
<When stuck>	$\leq 403 \Omega$
Front oxygen (A/F) sensor impedance	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Input voltage (+)	$> 2.65 \text{ V}$
or	
Sensor reference voltage	$\leq 3.6 \text{ V}$
or	
Input current	$-45 \mu\text{A} - 45 \mu\text{A}$

Time needed for diagnosis:

Input voltage (+): 30000 ms

Sensor reference voltage: 2000 ms

Input current: 2000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0137 O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 2

DTC detecting condition:

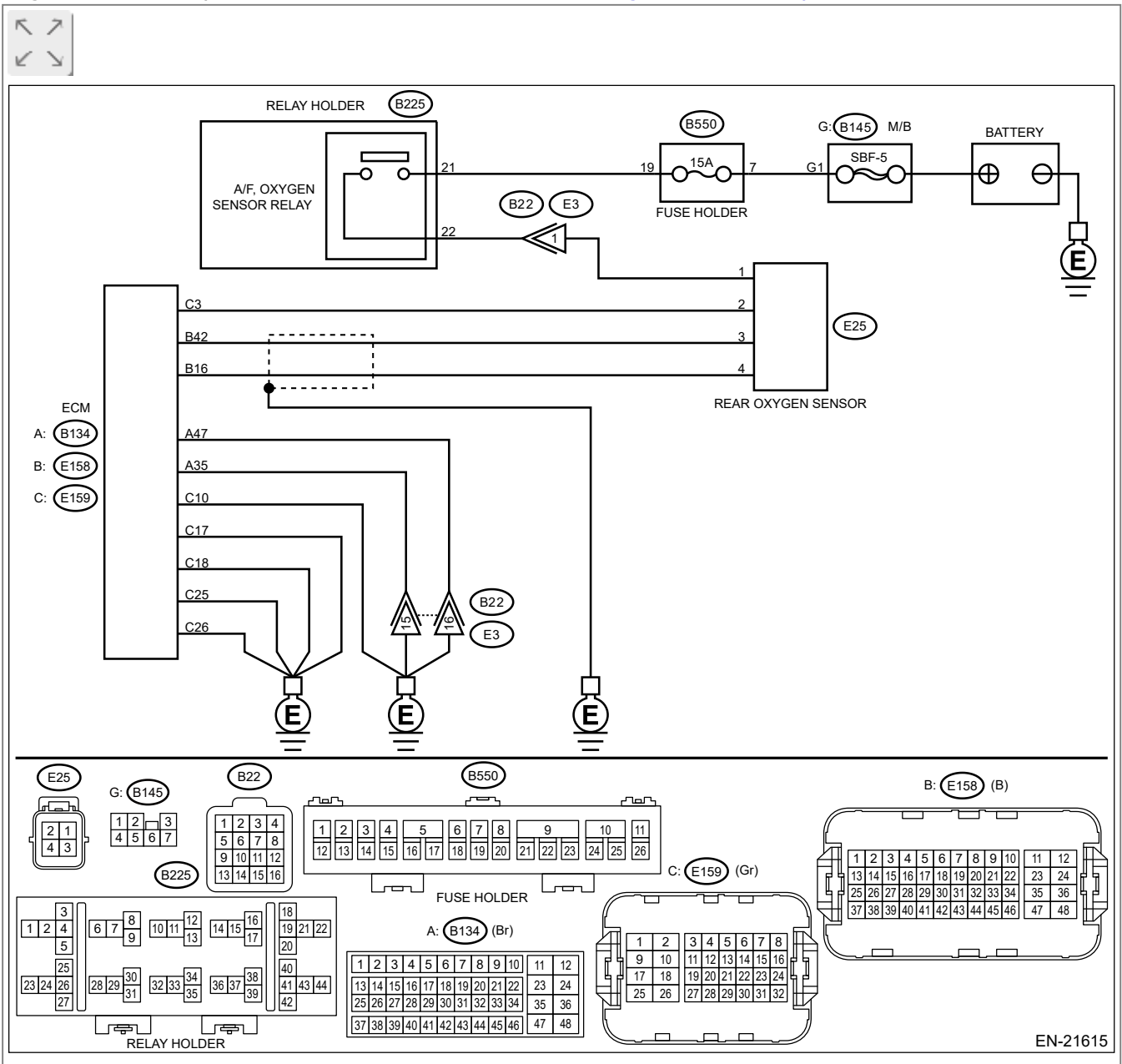
Detected when two consecutive driving cycles with fault occur.

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:


Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK REAR OXYGEN SENSOR DATA.

1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and keep the engine speed at 3,000 rpm. (2 minutes maximum)
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Oxygen sensor #12] 0.490 V or more?

Yes

 [Go to 6.](#)

No

 [Go to 2.](#)

2. CHECK REAR OXYGEN SENSOR CONNECTOR.

Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from rear oxygen sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.


Connector & terminal

(E158) No. 42 — (E25) No. 3:

(E158) No. 16 — (E25) No. 4:

Is the resistance less than 1 Ω?

Yes

 [Go to 4.](#)

No

Repair the open circuit of harness between ECM connector and rear oxygen sensor connector.

4. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.

Measure the resistance of harness between ECM connector and rear oxygen sensor connector.


Connector & terminal

(E158) No. 16 — Engine ground

(E158) No. 42 — Engine ground

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM connector and rear oxygen sensor connector.

5. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.


1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between rear oxygen sensor connector and engine ground.

Connector & terminal


(E25) No. 3 (+) — Engine ground (–)

Is the voltage 1.8 V or more?

Yes

Replace the rear oxygen sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Rear Oxygen Sensor>REMOVAL.](#)

No

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\)>REMOVAL.](#)

6. CHECK EXHAUST SYSTEM.

Check exhaust system parts.

Note:

Check the following items.


- **Looseness and improper fitting of exhaust system parts**
- **Damage (crack, hole etc.) of parts**
- **Loose part and improper installation between front oxygen (A/F) sensor and rear oxygen sensor**

Is there any fault in exhaust system?

Yes

Repair or replace faulty parts.

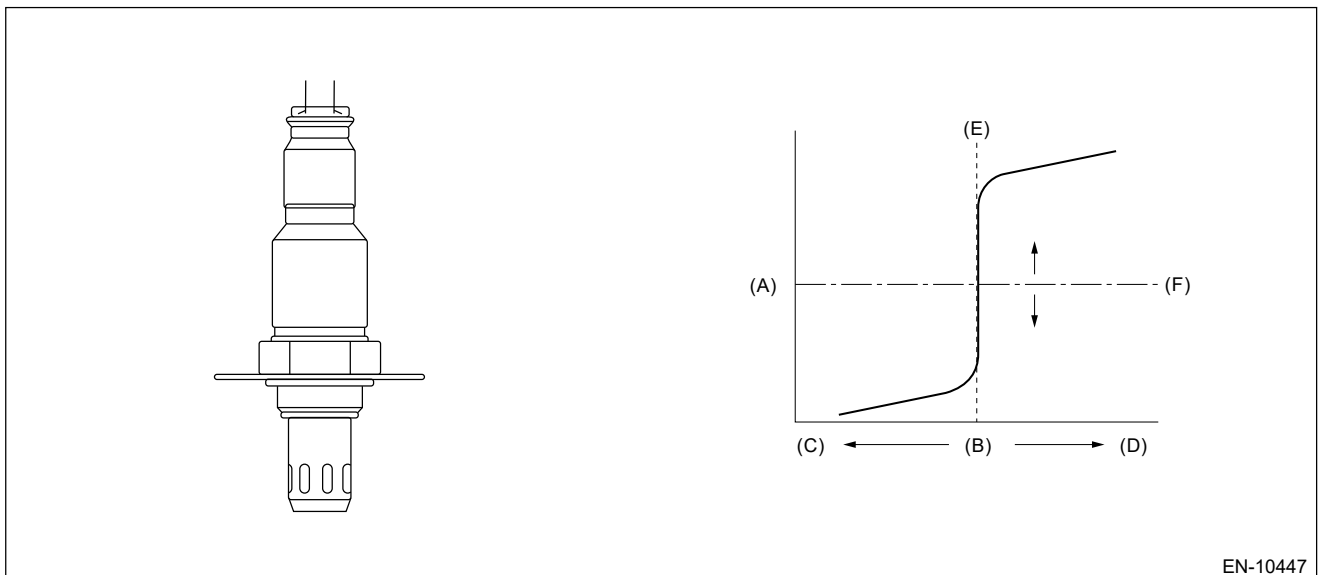
No

Replace the rear oxygen sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Rear Oxygen Sensor>REMOVAL.](#)

1. OUTLINE OF DIAGNOSIS

Detect continuity NG of the oxygen sensor. If the oxygen sensor voltage reading is not within the probable range considering the operating conditions, judge as NG.

2. COMPONENT DESCRIPTION



(A) Electromotive force

(B) Air fuel ratio

(C) Lean

(D) Rich

(E) Theoretical air fuel ratio

(F) Comparative voltage

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Judgment 1 (P0137, P0138)	
Battery voltage	$\geq 10.9 \text{ V}$
Judgment 2, 3 (P0137)	
Battery voltage	$\geq 10.9 \text{ V}$
Estimated temperature of the rear oxygen sensor element	$\geq 450^\circ\text{C}$ (842°F)

Rear oxygen sensor duty ratio after engine start	≥ 54400%
Rear oxygen sensor offset signal	≥ 1.8 V and ≤ 2.2 V

4. GENERAL DRIVING CYCLE

After starting the engine, continuously perform the diagnosis with the same engine condition.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value DTC (P0137)

Malfunction Criteria	Threshold Value
Judgment 1: Ground short	
Rear oxygen sensor offset signal (A)	< 1.8 V
Judgment 2: Open	
Rear oxygen sensor signal (B)	< 1.7 V
Judgment 3: Out of range	
Output voltage of rear oxygen sensor {(B) – (A)}	< –0.22 V

Judgment value DTC (P0138)

Malfunction Criteria	Threshold Value
Judgment 1: Battery short	
Rear oxygen sensor offset signal (A)	> 2.2 V
Judgment 2: Battery short	
Rear oxygen sensor signal (B)	> 3.25 V
Judgment 3: Out of range	
Output voltage of rear oxygen sensor {(B) – (A)}	> 1.2 V

Time needed for diagnosis:

Judgment 1: 1s

Judgment 2: 1s

Judgment 3: 1s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0138 O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 2

DTC detecting condition:

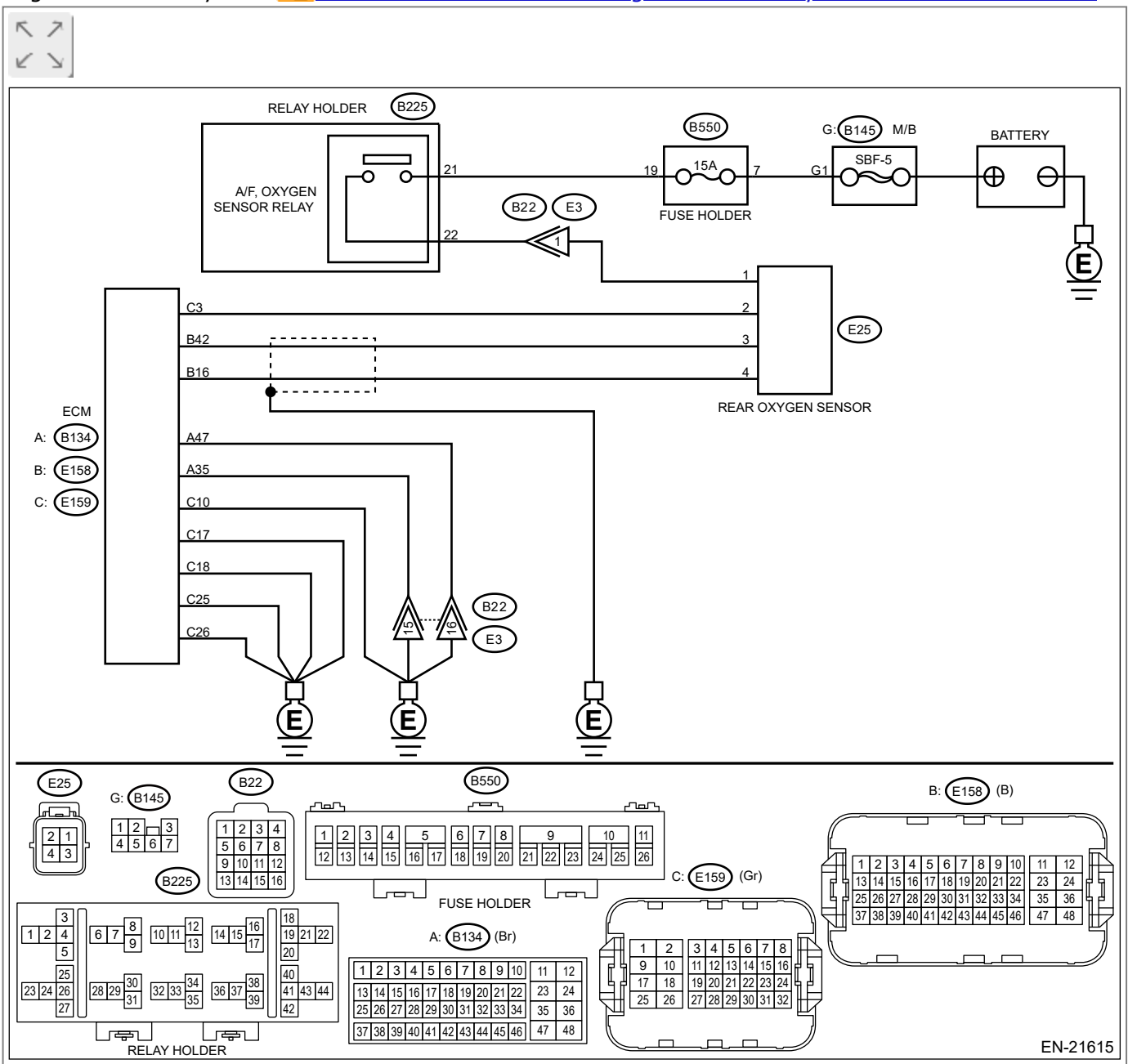
Detected when two consecutive driving cycles with fault occur.

Caution:

- After servicing or replacing faulty parts, perform **Clear Memory** Ref. to **ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode** Ref. to **ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:


Engine Electrical System Ref. to **WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.**



1. CHECK REAR OXYGEN SENSOR DATA.

1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and rapidly reduce the engine speed from 3,000 rpm.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Oxygen sensor #12] 0.250 V or less?

Yes

 [Go to 5.](#)

No

 [Go to 2.](#)

2. CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.

Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from rear oxygen sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and rear oxygen sensor connector.

Connector & terminal

(E158) No. 42 — (E25) No. 3:

(E158) No. 16 — (E25) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and rear oxygen sensor connector**
- **Poor contact of coupling connector**

4. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.


1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between rear oxygen sensor connector and chassis ground.

Connector & terminal

(E25) No. 4 (+) — Chassis ground (-):

Is the voltage 0.2 — 0.5 V?

Yes

Replace the rear oxygen sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Rear Oxygen Sensor.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and rear oxygen sensor connector**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

5. CHECK EXHAUST SYSTEM.

Check exhaust system parts.

Note:

Check the following items.


- **Looseness and improper fitting of exhaust system parts**
- **Damage (crack, hole etc.) of parts**
- **Loose part and improper installation between front oxygen (A/F) sensor and rear oxygen sensor**

Is there any fault in exhaust system?

Yes


Repair or replace faulty parts.

No

Replace the rear oxygen sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Rear Oxygen Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0137.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0137 O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 2.](#)



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P013A O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2

DTC detecting condition:

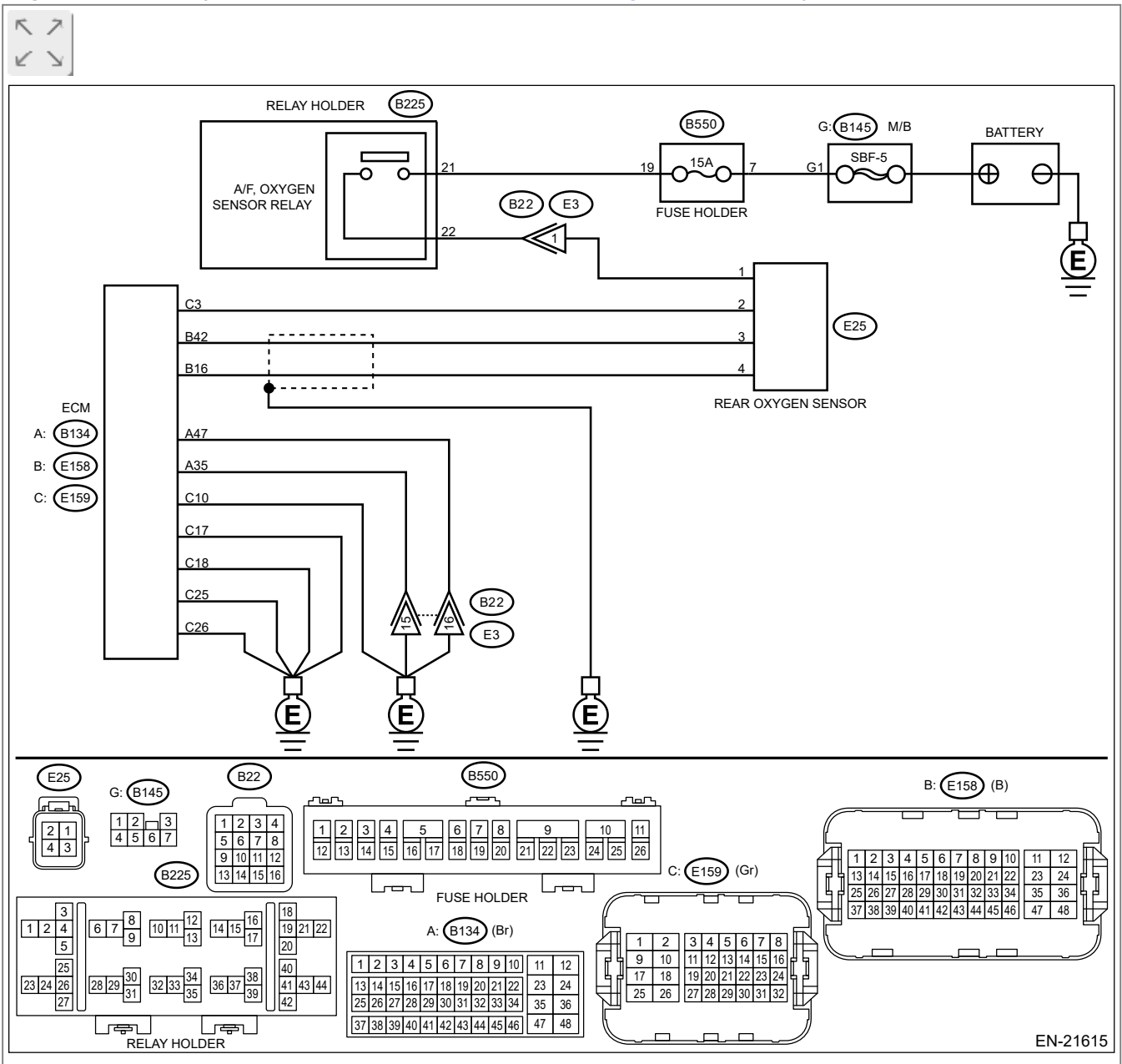
Detected when two consecutive driving cycles with fault occur.

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from rear oxygen sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and rear oxygen sensor connector.

Connector & terminal

(E158) No. 16 — (E25) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 2.](#)

No

Repair the open circuit of harness between ECM and rear oxygen sensor connector.

2. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.



Measure the resistance between rear oxygen sensor connector and engine ground.

Connector & terminal

(E25) No. 4 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 3.](#)

No

Repair the ground short circuit of harness between ECM and rear oxygen sensor connector.

3. CHECK REAR OXYGEN SENSOR.




Measure the resistance between rear oxygen sensor terminals.

Terminals

No. 3 — No. 4

Is the resistance less than 1 Ω ?

Yes

Replace the rear oxygen sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Rear Oxygen Sensor.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this

time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

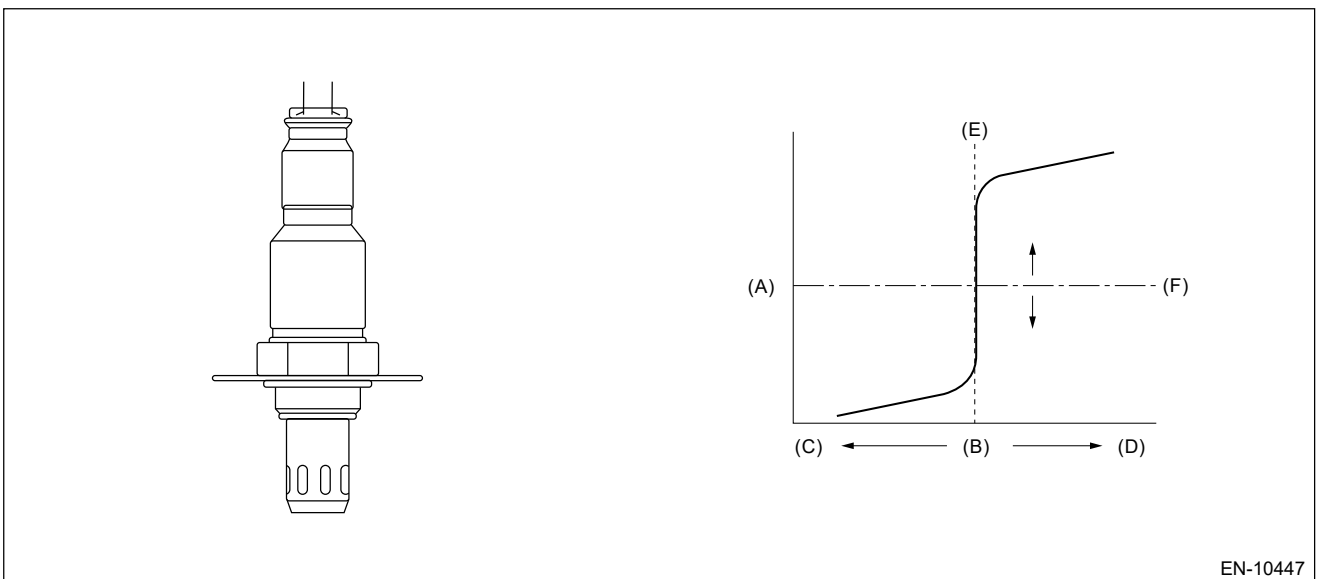
1. OUTLINE OF DIAGNOSIS

Detect the slow response of rich → lean for rear oxygen sensor output.

When the deceleration fuel cut has occurred, detect the trouble by calculating the time when the rear oxygen sensor output passes through the predetermined range of voltages.

Judge as NG when the response time is larger than the threshold value.

2. COMPONENT DESCRIPTION



EN-10447

(A) Electromotive force

(B) Air fuel ratio

(C) Lean

(D) Rich

(E) Theoretical air fuel ratio

(F) Comparative voltage

3. EXECUTION CONDITION

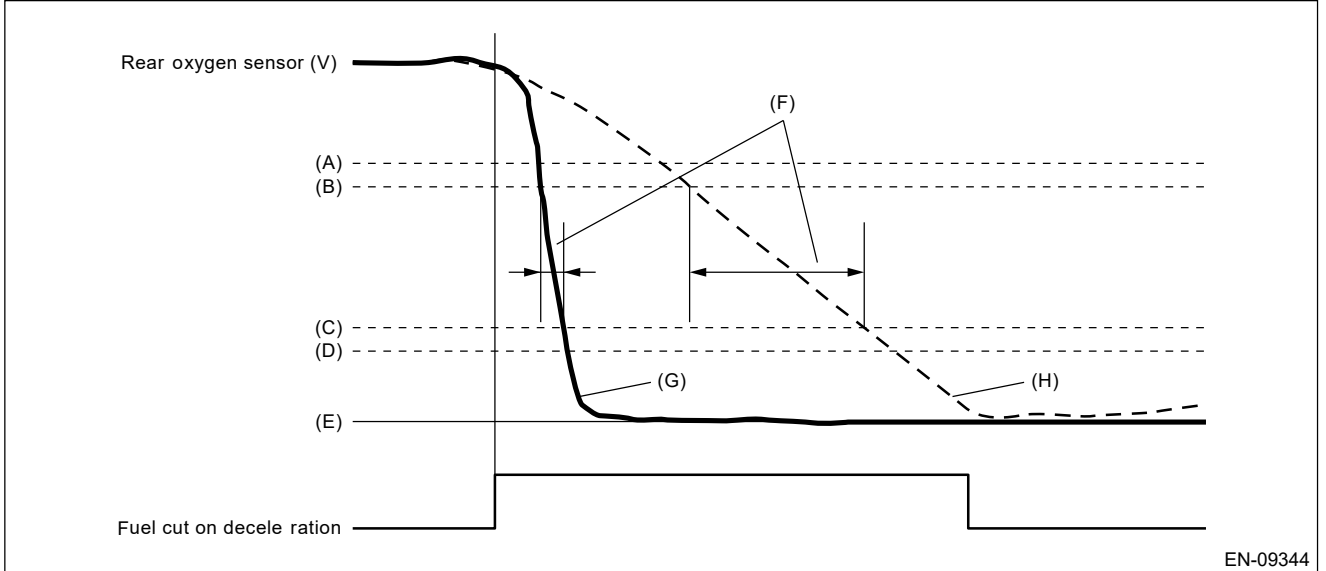
Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Current calculation time of the rear oxygen sensor heater after starting	≥ 180000 ms
Rear oxygen sensor voltage when fuel cut starts	≥ 0.55 V
Fuel cut	In operation
Estimated temperature of rear oxygen sensor element when fuel cut starts	≥ 450°C (842°F)

4. GENERAL DRIVING CYCLE

After starting the engine, perform the diagnosis continuously when engine is low speed.

5. DIAGNOSTIC METHOD

Detect the trouble by calculating the response time of the rear oxygen sensor during fuel cut.



- (A) 0.55 V
- (B) 0.50 V
- (C) 0.20 V
- (D) 0.15 V
- (E) 0 V
- (F) Diagnostic parameter
- (G) Normal
- (H) Malfunction

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Time needed for rear oxygen sensor voltage to change from 0.5 V to 0.2 V	> 837 ms


Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P013B O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 2

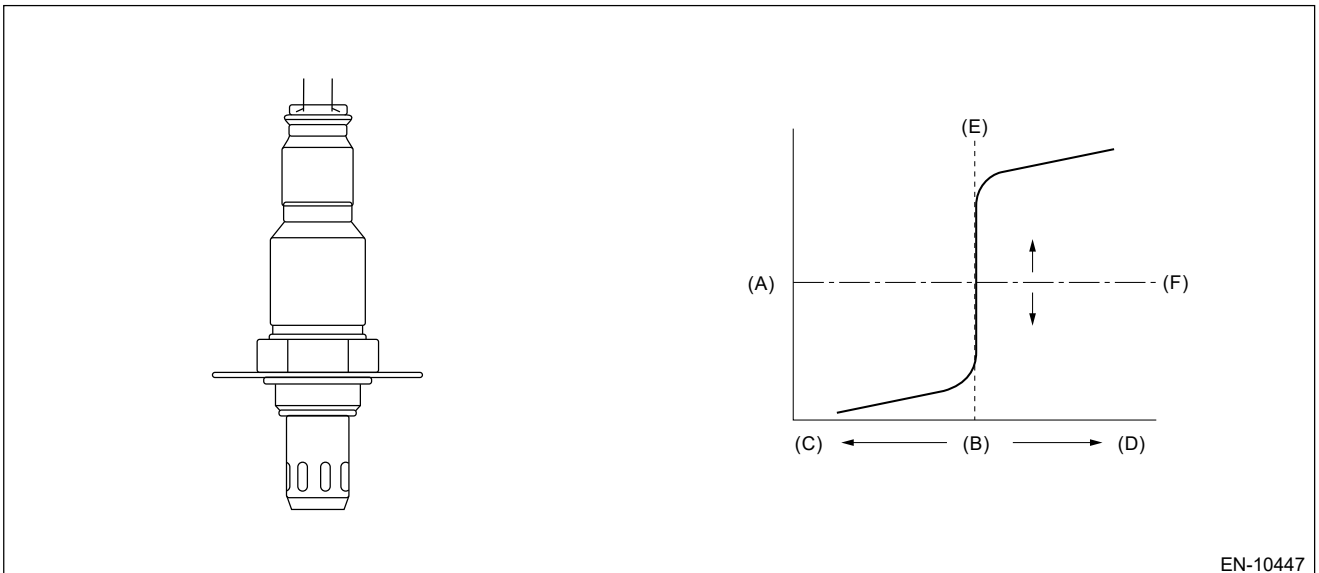
Note:

For the diagnostic procedure, refer to DTC P013A.  Ref. to [ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P013A O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2.](#)

1. OUTLINE OF DIAGNOSIS

Detect the slow response of lean → rich for rear oxygen sensor output.
 After the deceleration fuel cut has occurred, detect the trouble by calculating the time when the rear oxygen sensor output passes through the predetermined range of voltages.
 Judge as NG when the response time is larger than the threshold value.

2. COMPONENT DESCRIPTION



EN-10447

- (A) Electromotive force
- (B) Air fuel ratio
- (C) Lean
- (D) Rich
- (E) Theoretical air fuel ratio
- (F) Comparative voltage

3. EXECUTION CONDITION

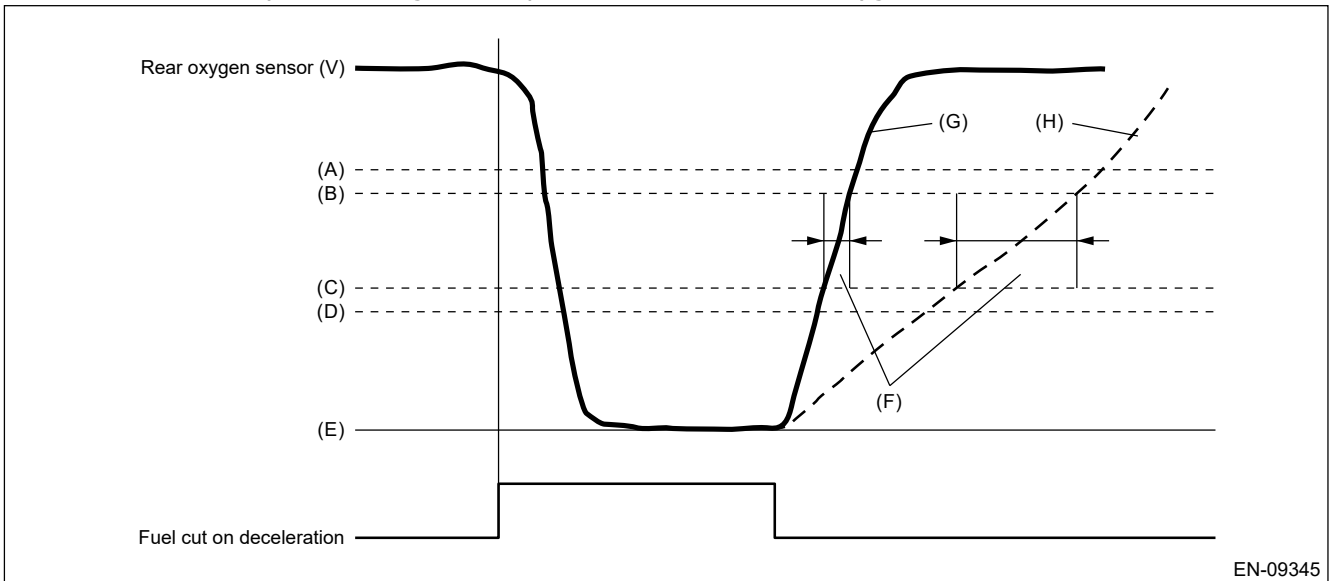
Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Main feedback	In operation
Deceleration fuel cut for 5000 ms or more	Experienced

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Detect the trouble by calculating the response time of the rear oxygen sensor after fuel cut.



EN-09345

- (A) 0.55 V (B) 0.50 V (C) 0.30 V
 (D) 0.25 V (E) 0 V (F) Diagnostic parameter
 (G) Normal (H) Malfunction

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Time needed for rear oxygen sensor voltage to change from 0.3 V to 0.5 V	> 4000 ms


Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P013E O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 2

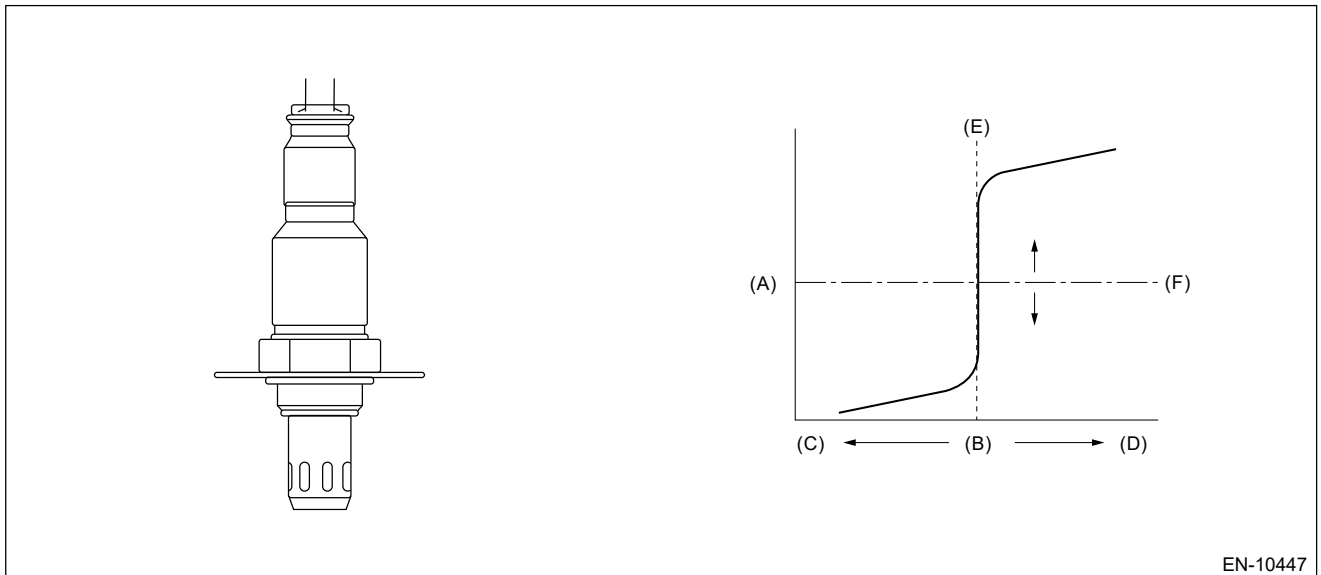
Note:

For the diagnostic procedure, refer to DTC P013A.  Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P013A O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2.

1. OUTLINE OF DIAGNOSIS

Detect the delayed response of rear oxygen sensor output for rich → lean.
 After the deceleration fuel cut has started, detect the trouble by calculating the time when the rear oxygen sensor output decreases to the predetermined voltages.
 Judge as NG when the response time is larger than the threshold value.

2. COMPONENT DESCRIPTION



EN-10447

- (A) Electromotive force
- (B) Air fuel ratio
- (C) Lean
- (D) Rich
- (E) Theoretical air fuel ratio
- (F) Comparative voltage

3. EXECUTION CONDITION

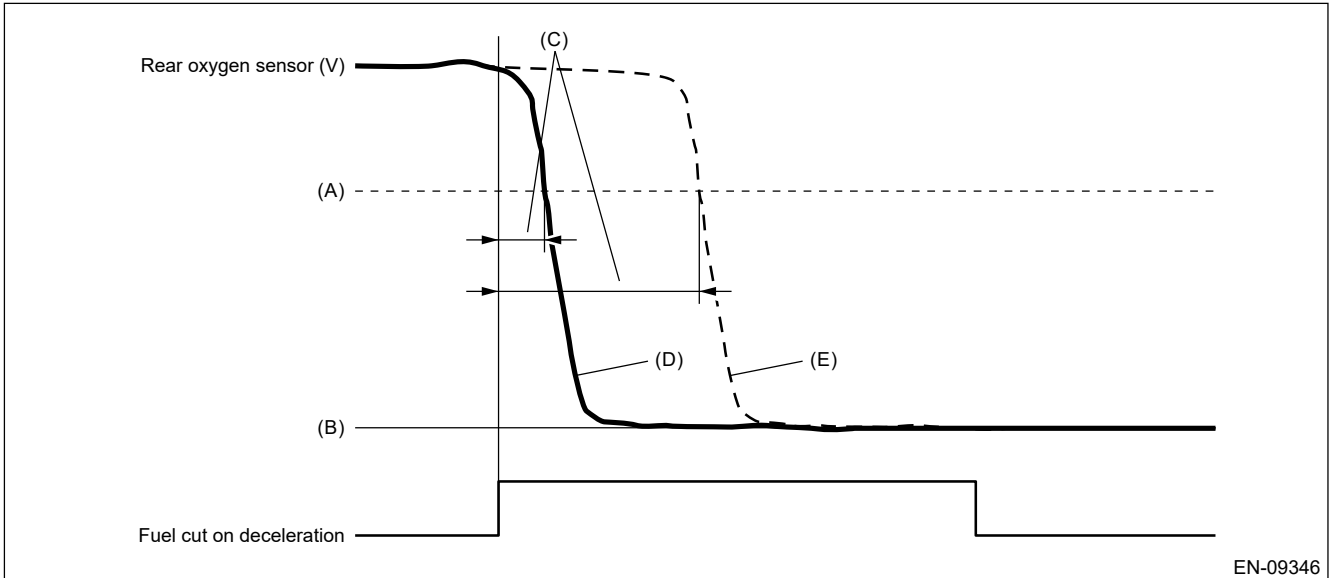
Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Rear oxygen sensor voltage when fuel cut starts	≥ 0.55 V
Fuel cut	In operation
Estimated temperature of rear oxygen sensor element when fuel cut starts	≥ 450°C (842°F)

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Detect the trouble by calculating the time from the beginning of the fuel cut to the beginning of the rear oxygen sensor voltage starting to drop.



EN-09346

(A) 0.5 V

(B) 0 V

(C) Diagnostic parameter

(D) Normal

(E) Malfunction

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Time needed for the rear oxygen sensor voltage to change up to 0.5 V after the fuel cut started	> 4000 ms


Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P013F O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 2

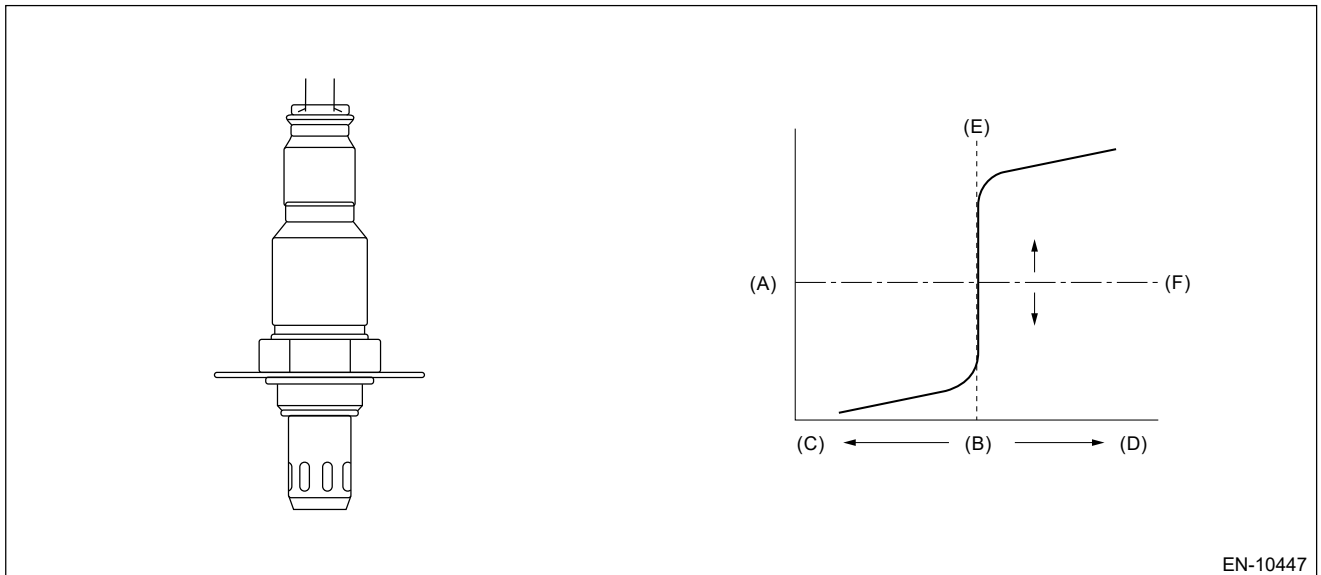
Note:

For the diagnostic procedure, refer to DTC P013A.  Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P013A O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2.

1. OUTLINE OF DIAGNOSIS

Detect the delayed response of rear oxygen sensor output for lean → rich.
 After the deceleration fuel cut has completed, detect the trouble by calculating the time when the rear oxygen sensor output increases to the predetermined voltages.
 Judge as NG when the response time is larger than the threshold value.

2. COMPONENT DESCRIPTION



EN-10447

- (A) Electromotive force
- (B) Air fuel ratio
- (C) Lean
- (D) Rich
- (E) Theoretical air fuel ratio
- (F) Comparative voltage

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Main feedback	In operation
Rear oxygen sensor voltage when fuel cut has completed	≤ 0.15 V
Deceleration fuel cut for 5000 ms or more	Experienced
Estimated element temperature	≥ 450°C (842°F)

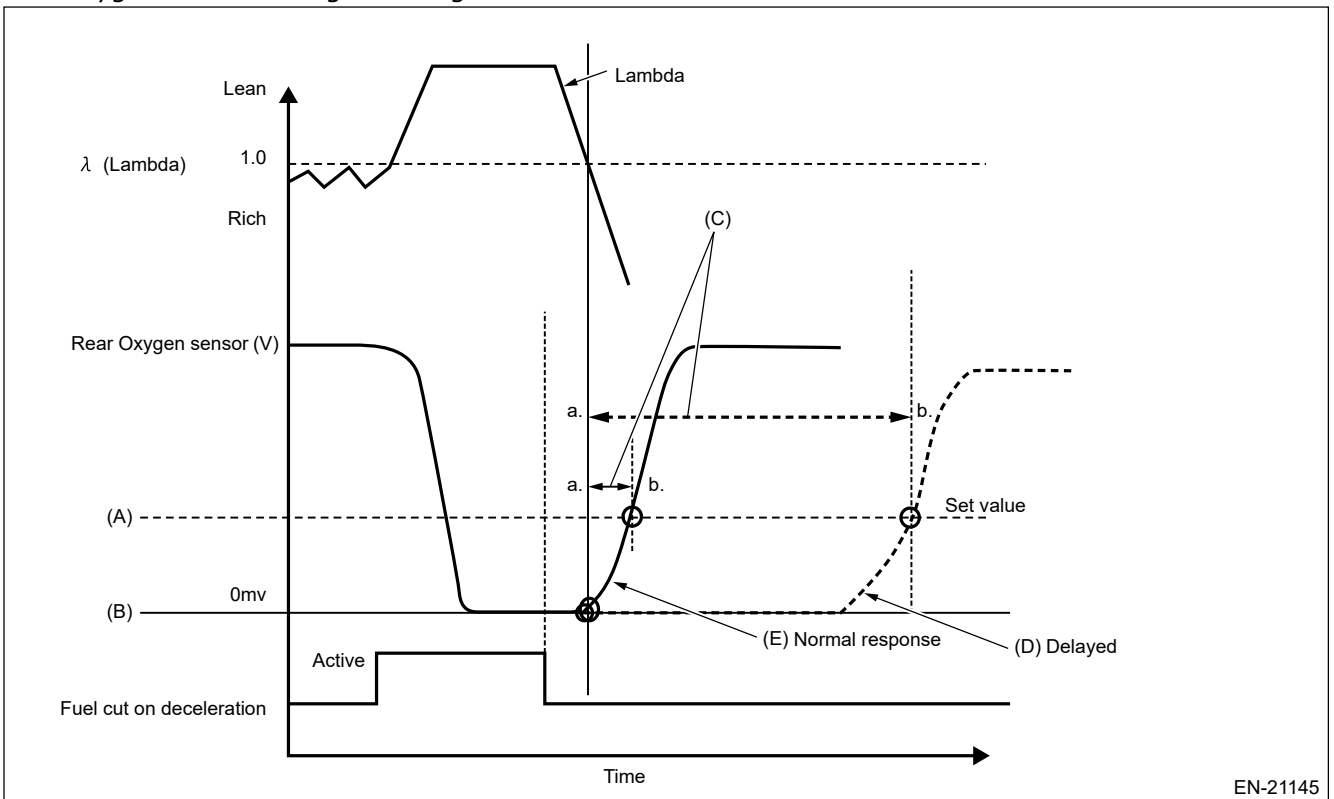
of rear oxygen sensor when fuel cut has completed	
Amount of intake air	$\geq 15 \text{ g/s (0.53 oz/s)}$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Detect the trouble by calculating the time from the completion of the fuel cut to the beginning of the rear oxygen sensor voltage starting to rise.



- (A) 0.3 V
- (B) 0 V
- (C) Diagnostic parameter
- (D) Normal
- (E) Malfunction

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage value of rear oxygen sensor	$< 0.2 \text{ V}$
Elapsed time	$> \text{Map}$

* Elapsed time: The time since the λ became less than 1 after the end of fuel cut

Map

Intake air amount (g/s)	15	16	18	20

Elapsed time (sec)	3.60	3.40	3.15	3.00
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Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0141 O2 SENSOR HEATER CIRCUIT BANK 1 SENSOR 2

DTC detecting condition:

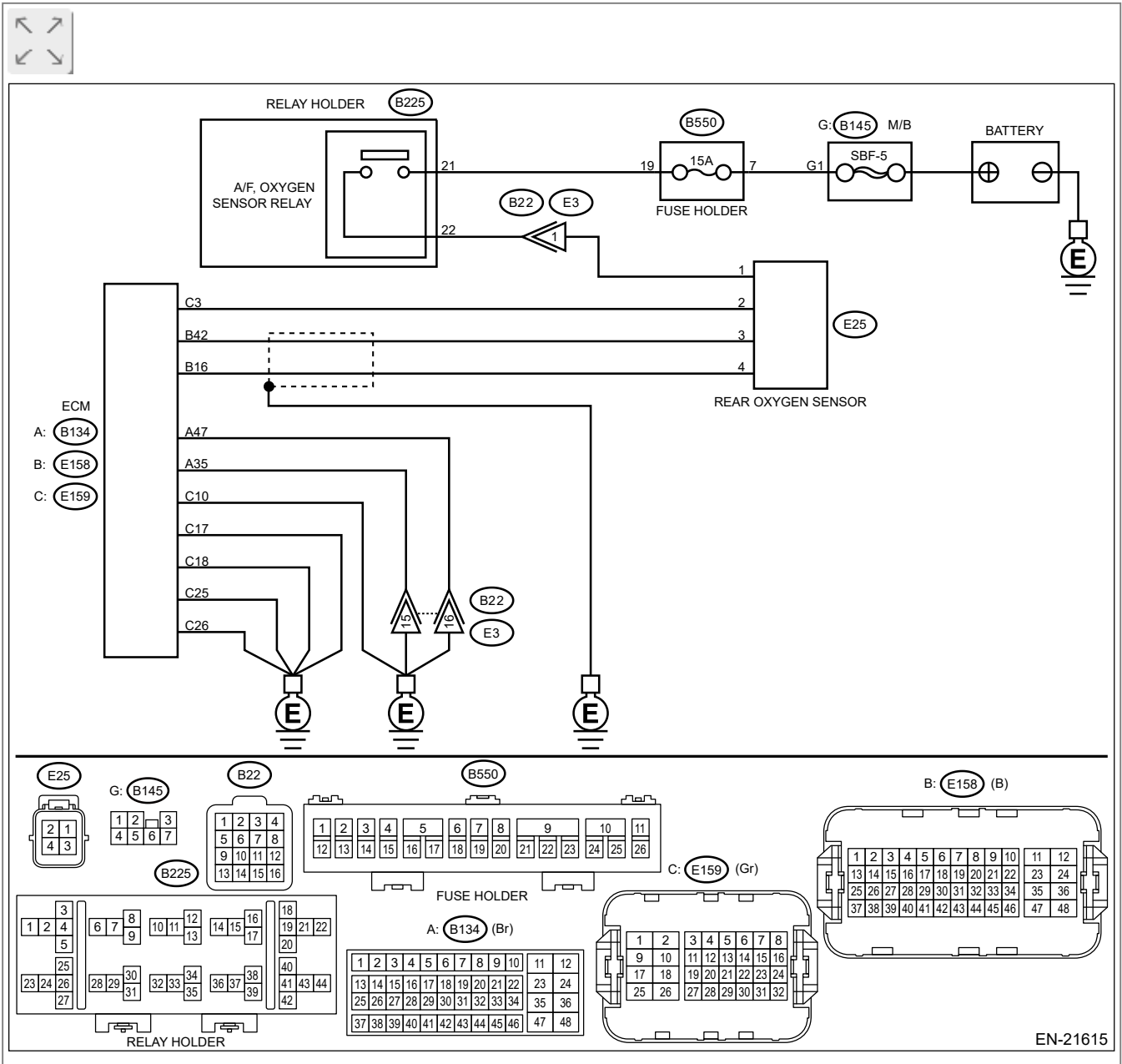
Detected when two consecutive driving cycles with fault occur.

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK POWER SUPPLY TO REAR OXYGEN SENSOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from rear oxygen sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between rear oxygen sensor connector and engine ground.

Connector & terminal

(E25) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

Repair the power supply line.

Note:

In this case, repair the following item:

- **Open circuit in harness between A/F, oxygen sensor relay and rear oxygen sensor connector**
- **Poor contact of A/F, oxygen sensor relay connector**
- **Poor contact of coupling connector**
- **Malfunction of A/F, oxygen sensor relay**

2. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between the ECM and rear oxygen sensor connector.

Connector & terminal

(E25) No. 2 — (E159) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit of harness between ECM and rear oxygen sensor connector.

3. CHECK GROUND CIRCUIT FOR ECM.



Measure the resistance of harness between ECM and engine ground.

Connector & terminal

(B134) No. 35 — Engine ground:
(B134) No. 47 — Engine ground:
(E159) No. 10 — Engine ground:
(E159) No. 17 — Engine ground:
(E159) No. 18 — Engine ground:
(E159) No. 25 — Engine ground:
(E159) No. 26 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM and engine ground**
- **Poor contact of coupling connector**

4. CHECK REAR OXYGEN SENSOR.



Measure the resistance between rear oxygen sensor connector terminals.

Terminals


No. 1 — No. 2:

Is the resistance 5.4 — 7.3 Ω ?

Yes

Repair the poor contact of ECM connector.

No

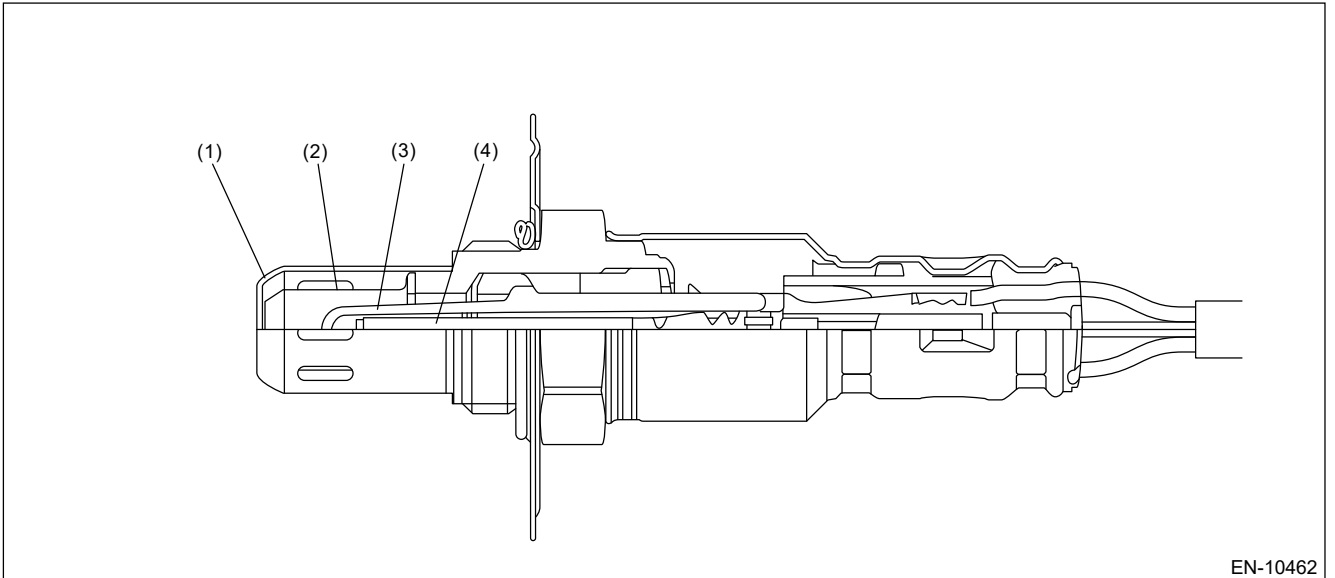
Replace the rear oxygen sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Rear Oxygen Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect malfunction of the rear oxygen sensor heater.

Judge as NG if it is determined that the rear oxygen sensor impedance is large by observing the engine conditions.

2. COMPONENT DESCRIPTION



- (1) Element cover (outer)
- (2) Element cover (inner)
- (3) Sensor element
- (4) Ceramic heater

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Rear oxygen sensor heater control duty	$\geq 4\%$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Rear oxygen sensor heater current	$< \text{Value from Map}$

Map

Battery voltage (V)	10.9	12	13	14	15	16
Threshold Value (mA)	330	357.5	385	412.5	440	467.5

Time needed for diagnosis: 10 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P014C A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

1. CHECK EXHAUST SYSTEM.

Note:

Check the following items.

- Loose installation of front portion of exhaust pipe onto cylinder heads
- Loose connection between front exhaust pipe and front catalytic converter
- Damage of exhaust pipe resulting in a hole

Is there any fault in exhaust system?

Yes

Repair the exhaust system.

No

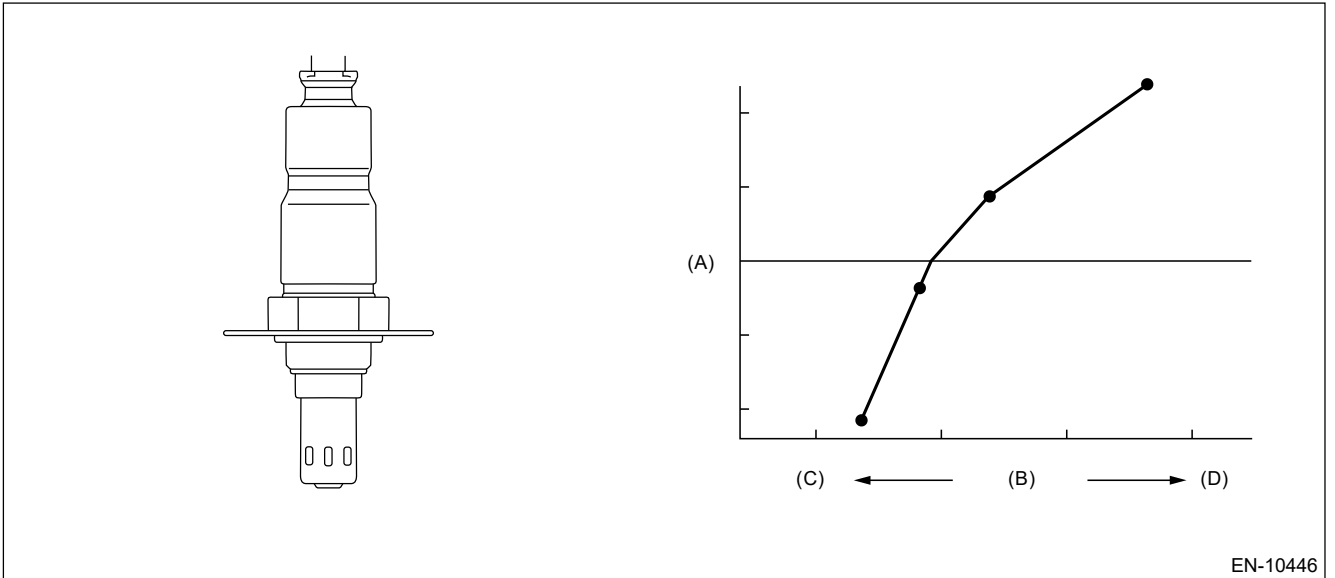
Replace the front oxygen (A/F) sensor.  Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Front Oxygen (A/F) Sensor.

1. OUTLINE OF DIAGNOSIS

Detect the slow response of front oxygen (A/F) sensor.

For diagnosis, detect the trouble by processing the λ waveform in normal driving without forcibly changing the target air fuel ratio.

2. COMPONENT DESCRIPTION



(A) Electromotive force

(B) Air fuel ratio

(C) Rich

(D) Lean

3. EXECUTION CONDITION

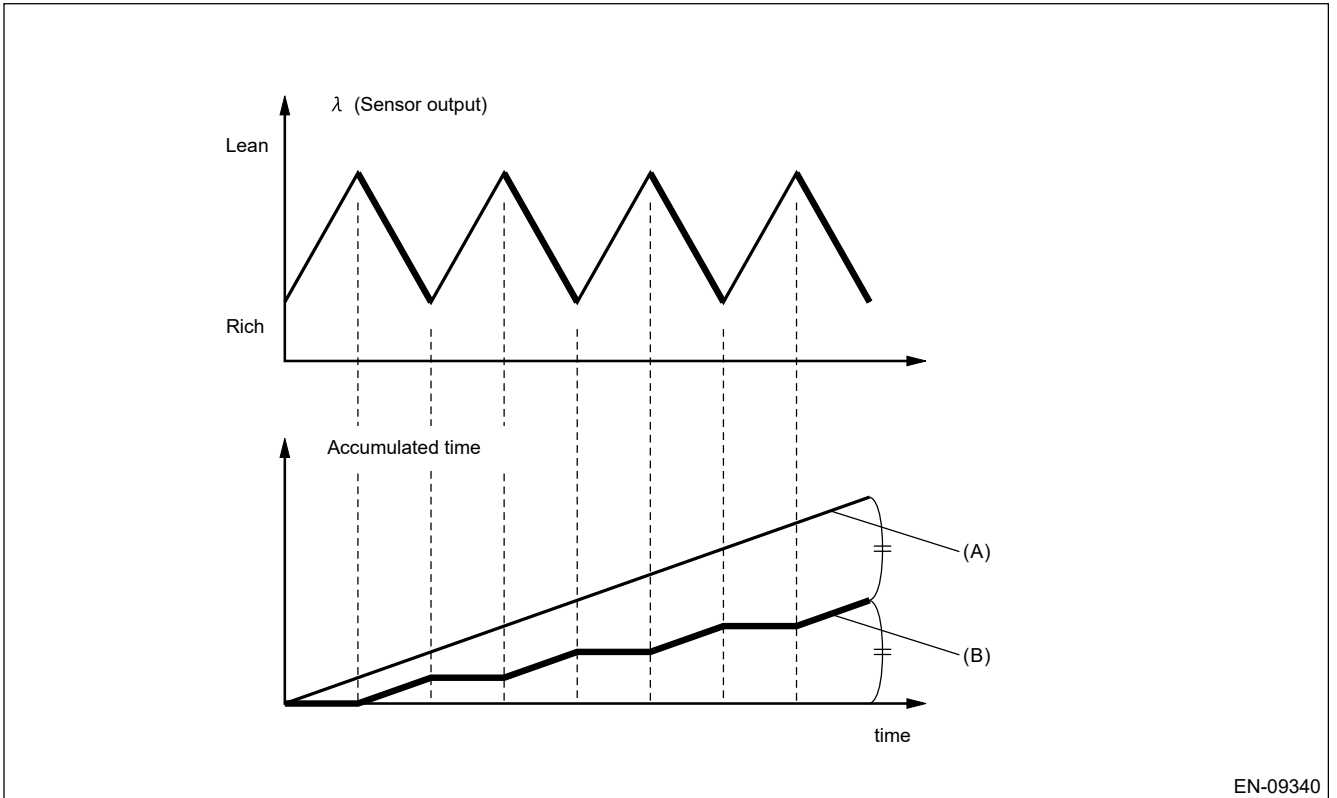
Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Barometric pressure	$> 75.6 \text{ kPa}$ (567.1 mmHg , 22.3 inHg)
Operation time of main feedback	$\geq 5 \text{ s}$
Engine speed	$\geq 1000 \text{ rpm}$
Amount of intake air	$\geq 10 \text{ g/s}$ (0.35 oz/s)
Accelerator position	$> 0\%$

4. GENERAL DRIVING CYCLE

Perform diagnosis only once in a city driving including normal acceleration and deceleration.

5. DIAGNOSTIC METHOD 1

Detect the malfunction by checking "Cumulative value of time when λ changes from lean \rightarrow rich" in comparison to "Time during which diagnosis is in progress".



EN-09340

- (A) Time during which diagnosis is in progress
- (B) Cumulative value of time when λ changes from lean \rightarrow rich

Judge as NG when the following conditions are established.

Judgment value

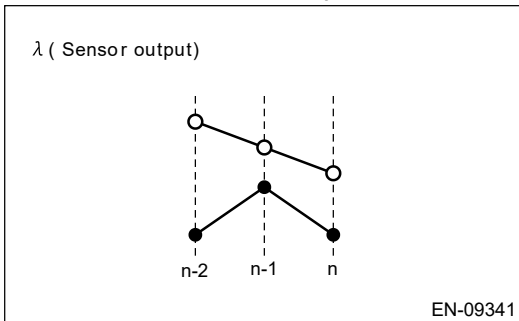
Malfunction Criteria	Threshold Value	DTC
Cumulative value of time when λ changes from lean \rightarrow rich) / (Time during which diagnosis is in progress)	< 0.38	P014C
Average value of time necessary for λ to inverse the air fuel ratio to Lean \rightarrow Rich \rightarrow Lean	> 0.01 s	
Cumulative value of time when λ changes from lean \rightarrow rich) / (Time during which diagnosis is in progress)	> 0.61	P014D
Average value of time necessary for λ to inverse the air fuel ratio to Rich \rightarrow Lean \rightarrow Rich	> 0 s	

Time Needed for Diagnosis: 90 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

6. DIAGNOSTIC METHOD 2

Detect the malfunction by the cumulative value obtained from the amount of variation in λ change.



Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Cumulative value obtained from the amount of variation in λ change	< Value from Map	P014C and P014D

Map

Cumulative value obtained from the amount of variation in λ	0.00	3.0
Cumulative value obtained from the amount of variation in λ change	0.00	2.5


Time Needed for Diagnosis: 90 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P014D A/F / O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 1

Note:

For the diagnostic procedure, refer to DTC P014C.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P014C A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1.](#)

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to DTC P014C.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P014C A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P015A A/F / O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 1

Note:

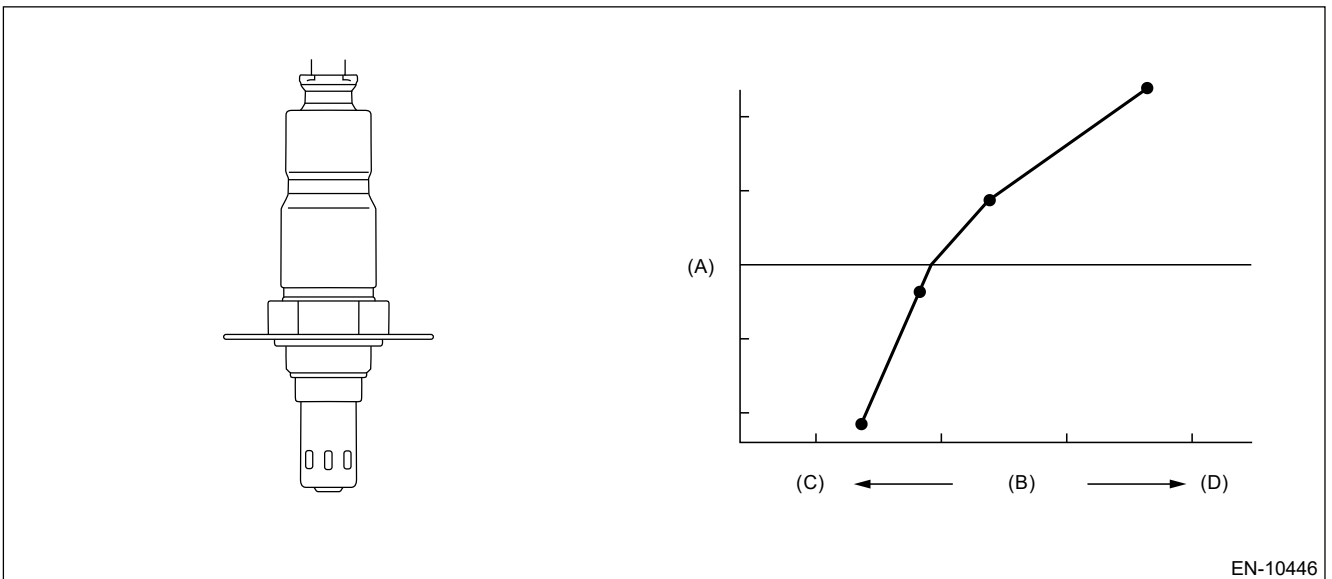
For the diagnostic procedure, refer to DTC P014C.  Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P014C A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1.

1. OUTLINE OF DIAGNOSIS

Detect the slow response of front oxygen (A/F) sensor.

For diagnosis, detect the trouble by processing the λ waveform in normal driving without forcibly changing the target air fuel ratio.

2. COMPONENT DESCRIPTION



EN-10446

(A) Electromotive force

(B) Air fuel ratio

(C) Rich

(D) Lean

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Barometric pressure	> 75 kPa (562.6 mmHg, 22.2 inHg)
Accelerator position	> 0%
Operation time of main feedback	≥ 5 s
Engine speed	≥ 1000 rpm

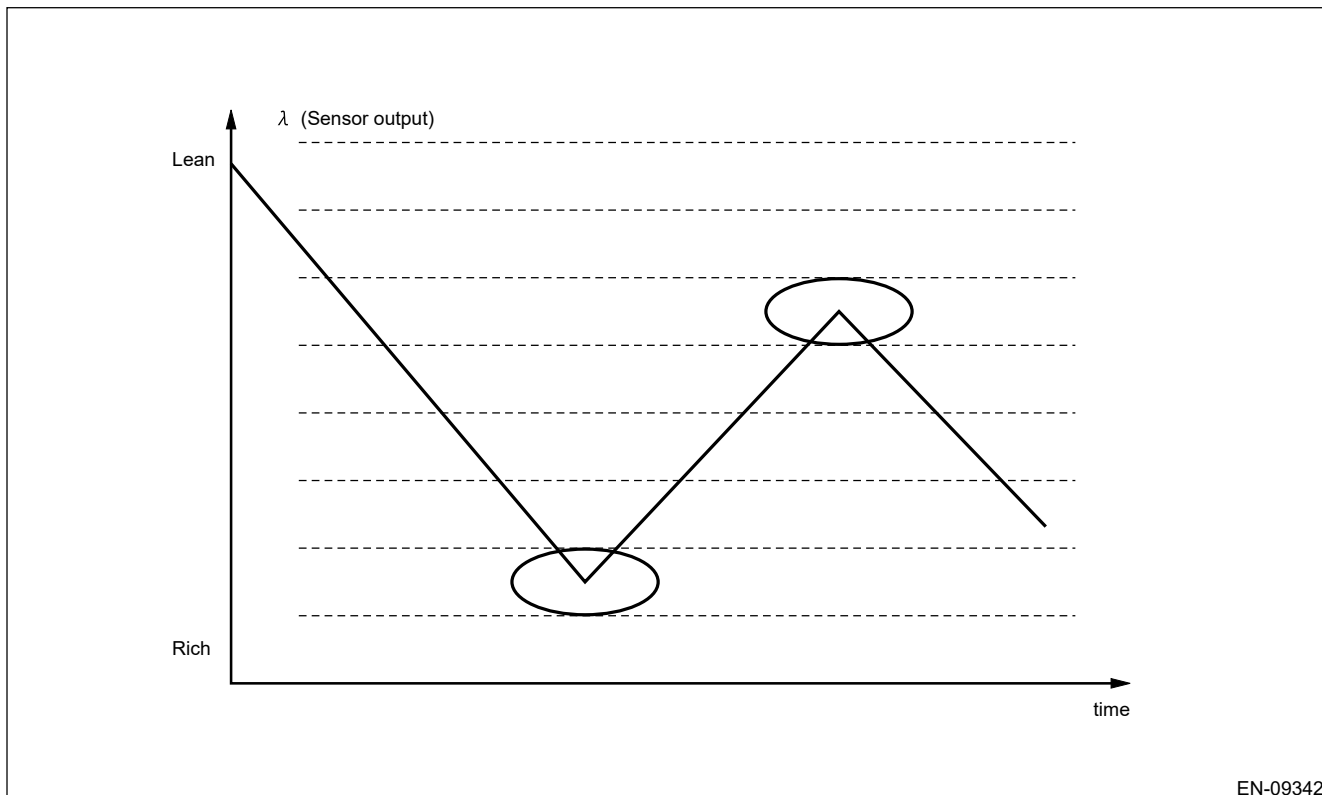
Amount of intake air	$\geq 10 \text{ g/s (0.35 oz/s)}$
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4. GENERAL DRIVING CYCLE

Perform diagnosis only once in a city driving including normal acceleration and deceleration.

5. DIAGNOSTIC METHOD 1

Detect the malfunction depending on the average value of time necessary for λ to inverse the air fuel ratio from "Lean \rightarrow Rich \rightarrow Lean" to "Rich \rightarrow Lean \rightarrow Rich".



Judge as NG when the following conditions are established.

Judgment value

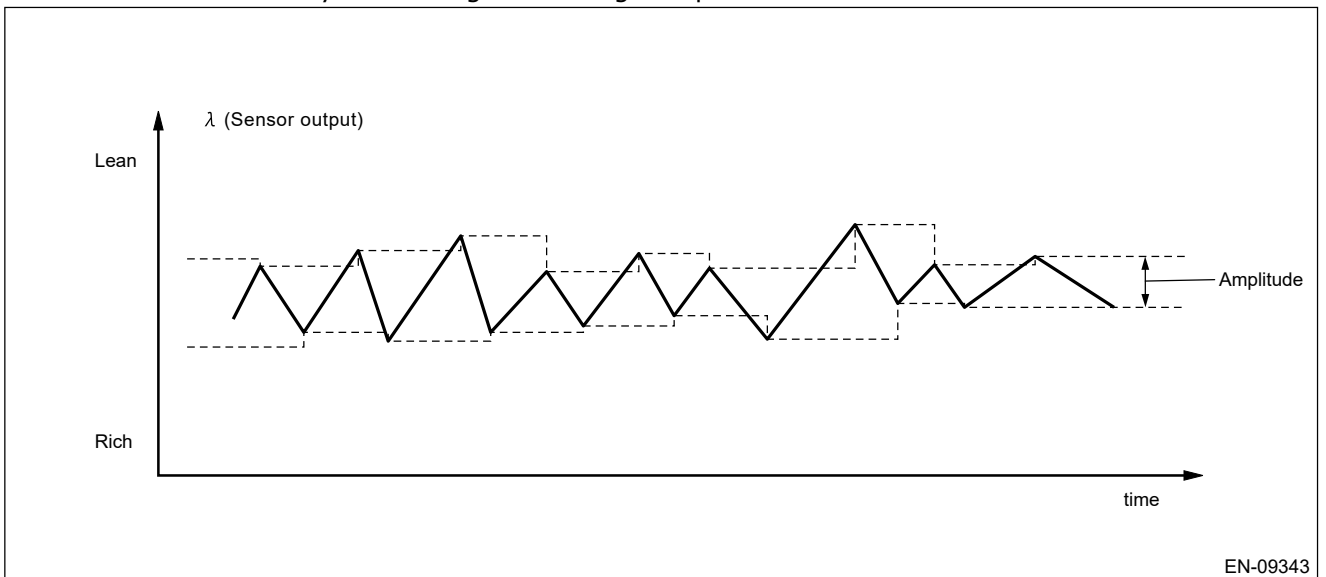
Malfunction Criteria	Threshold Value	DTC
Average value of time necessary for λ to inverse the air fuel ratio to Lean \rightarrow Rich \rightarrow Lean	$> 80 \text{ ms}$	P015A
Average value when λ is lean	$> 100 \text{ ms}$	
Average value of time necessary for λ to inverse the air fuel ratio to Rich \rightarrow Lean \rightarrow Rich	$> 70 \text{ ms}$	P015B
Average value when λ is rich	$> 110 \text{ ms}$	

Time needed for diagnosis: 90 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

6. DIAGNOSTIC METHOD 2

Detect the malfunction by calculating the average amplitude of λ .



Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Average value for λ amplitude	> 0.06	P015A and P015B


Time needed for diagnosis: 90 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P015B A/F / O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 1

Note:

For the diagnostic procedure, refer to DTC P014C.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P014C A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P015A.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P015A A/F / O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 1.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0171 SYSTEM TOO LEAN BANK 1

Note:

For the diagnostic procedure, refer to DTC P0172.  Ref. to [ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0172 SYSTEM TOO RICH BANK 1.](#)

1. OUTLINE OF DIAGNOSIS

Detect fuel system malfunction by the amount of main feedback control.

DIAGNOSTIC METHOD

Fuel system is diagnosed by comparing the target air fuel ratio calculated by ECM with the actual air fuel ratio measured by sensor.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Main feedback	In operation

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

Compare the diagnostic value with the threshold value, and if a condition meeting the criteria continues for 10 s × 3 times or more, judge that there is a fault in the fuel system.

Judgment value

Malfunction Criteria	Threshold Value
Offset amount of main feedback compensation	> 1.35

Time needed for diagnosis: 10 s × 3 times

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0172 SYSTEM TOO RICH BANK 1



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Improper idling
- Engine stalls.
- Poor driving performance

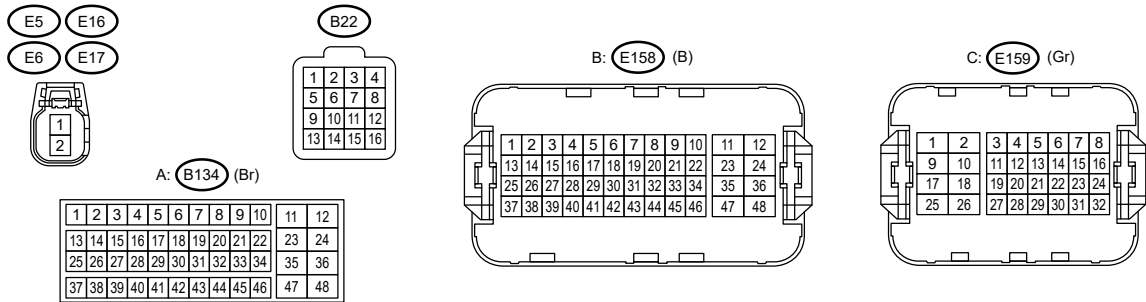
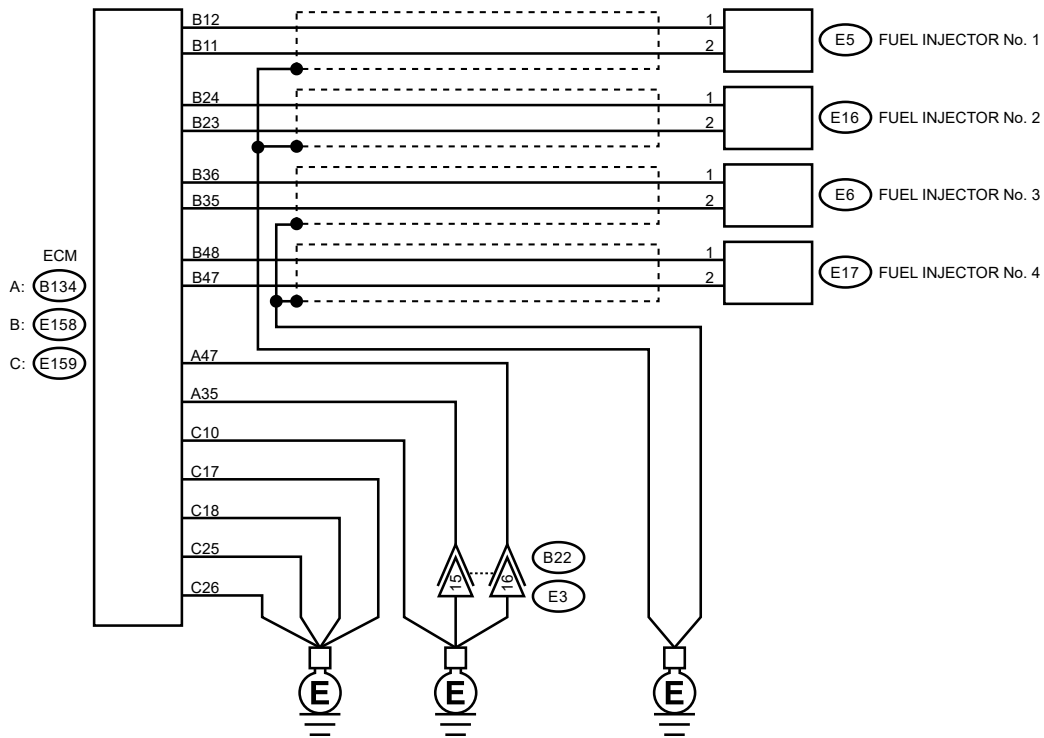
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21237

1. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.

Connector & terminal


- #1 (E158) No. 11 — (E158) No. 12:
- #2 (E158) No. 23 — (E158) No. 24:
- #3 (E158) No. 35 — (E158) No. 36:
- #4 (E158) No. 47 — (E158) No. 48:

Is the resistance 1.89 — 2.31 Ω (at 20°C (68°F))?

Yes

Go to 3.

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

1. Disconnect the connector from fuel injector.
2. Measure the resistance of harness between ECM connector and defective fuel injector connector.


Connector & terminal

- #1 (E158) No. 12 — (E5) No. 1:
- #1 (E158) No. 11 — (E5) No. 2:
- #2 (E158) No. 24 — (E16) No. 1:
- #2 (E158) No. 23 — (E16) No. 2:
- #3 (E158) No. 36 — (E6) No. 1:
- #3 (E158) No. 35 — (E6) No. 2:
- #4 (E158) No. 48 — (E17) No. 1:
- #4 (E158) No. 47 — (E17) No. 2:

Is the resistance less than 1 Ω ?

Yes

Repair or replace the following items.

- Poor contact of fuel injector connector
- Defective fuel injector  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Injector.](#)

No

Repair the open circuit of the harness between the ECM connector and fuel injector connector.

3. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.


Measure the resistance between the ECM connector and engine ground.

Connector & terminal


- #1 (E158) No. 12 — Engine ground:
- #1 (E158) No. 11 — Engine ground:
- #2 (E158) No. 24 — Engine ground:
- #2 (E158) No. 23 — Engine ground:
- #3 (E158) No. 36 — Engine ground:
- #3 (E158) No. 35 — Engine ground:
- #4 (E158) No. 48 — Engine ground:
- #4 (E158) No. 47 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

 [Go to 4.](#)

4. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.


1. Disconnect the connector from fuel injector.
2. Measure the resistance between ECM connector and engine ground on defective fuel injectors.

Connector & terminal

- #1 (E158) No. 12 — Engine ground:
- #1 (E158) No. 11 — Engine ground:
- #2 (E158) No. 24 — Engine ground:
- #2 (E158) No. 23 — Engine ground:
- #3 (E158) No. 36 — Engine ground:
- #3 (E158) No. 35 — Engine ground:
- #4 (E158) No. 48 — Engine ground:
- #4 (E158) No. 47 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

Replace the faulty fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Injector.](#)

No

Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

5. CHECK EXHAUST SYSTEM.

Are there holes or loose bolts on exhaust system?

Yes

Repair the exhaust system.

No

 [Go to 6.](#)


6. CHECK AIR INTAKE SYSTEM.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes

Repair the air intake system.

No

 [Go to 7.](#)

7. CHECK FUEL PRESSURE.

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.

Measure the fuel pressure.  [Ref. to MECHANICAL\(H4DOTC\)>Fuel Pressure>INSPECTION.](#)

Caution:



Release fuel pressure before removing the fuel pressure gauge.

Is the measured value 328 — 358 kPa (3.3 — 3.7 kgf/cm², 48 — 52 psi)?

Yes

 [Go to 8.](#)


No

Check the fuel pump and fuel delivery line.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pump>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Delivery and Evaporation Lines>INSPECTION.](#)

8. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Coolant Temp.].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Coolant Temp.] 75°C (167°F) or more?

Yes

 [Go to 9.](#)


No

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Coolant Temperature Sensor.](#)

9. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.


1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. Place the select lever in "P" range or "N" range.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Using the Subaru Select Monitor or a general scan tool, read the value of [Air Flow Rate from Mass Air Flow Sensor].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Air Flow Rate from Mass Air Flow Sensor] 2.0 — 5.0 g/s (0.26 — 0.66 lb/m)?

Yes

 [Go to 10.](#)


No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

10. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. Place the select lever in "P" range or "N" range.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Open the front hood.
6. Measure the ambient temperature.
7. Using the Subaru Select Monitor or a general scan tool, read the value of [Intake Air Temperature (B1-S1)].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Subtract ambient temperature from [Intake Air Temperature (B1-S1)]. Is the obtained value -10 – 50°C (-18 – 90°F)?

Yes

[Go to 11.](#)

No

Check the mass air flow and intake air temperature sensor. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

11. CHECK FUEL INJECTOR.

Check fuel injector. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Injector>INSPECTION.](#)

Are fuel injectors OK?

Yes

Repair the poor contact of ECM connector.

No

Replace the faulty fuel injector. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Injector.](#)

12. CHECK PCV VALVE.

Check the PCV valve.

Is the PCV valve free from deformation, crack or other damage?

Yes

Repair or replace the PCV valve. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>PCV Valve.](#)

No

[Go to 13.](#)

13. CHECK PCV HOSE.


Check the PCV hose.

Is the PCV hose free from deformation, crack or other damage?

Yes

Check the PCV hose assembly for cracks, damage or looseness. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>PCV Hose Assembly.](#)

No

 [Go to 14.](#)

14. CHECK PCV HOSE.



Check the PCV hose.

Check the clamp of PCV hose assembly for damage or looseness.

Yes

Repair or replace the PCV valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>PCV Valve.](#)

No

Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Detect fuel system malfunction by the amount of main feedback control.

DIAGNOSTIC METHOD

Fuel system is diagnosed by comparing the target air fuel ratio calculated by ECM with the actual air fuel ratio measured by sensor.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Main feedback	In operation

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

Compare the diagnostic value with the threshold value, and if a condition meeting the criteria continues for 10 s × 3 times or more, judge that there is a fault in the fuel system.

Judgment value

Malfunction Criteria	Threshold Value
Offset amount of main feedback amount	< Value from Map

Map

Warm-up increase compensation coefficient	0.00	0.10	0.20	0.30	0.33	0.50	0.60
Threshold Value	0.650	0.539	0.452	0.383	0.307	0.254	0.211

Time needed for diagnosis: 10 s × 3 times

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0191 FUEL RAIL PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE BANK 1



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

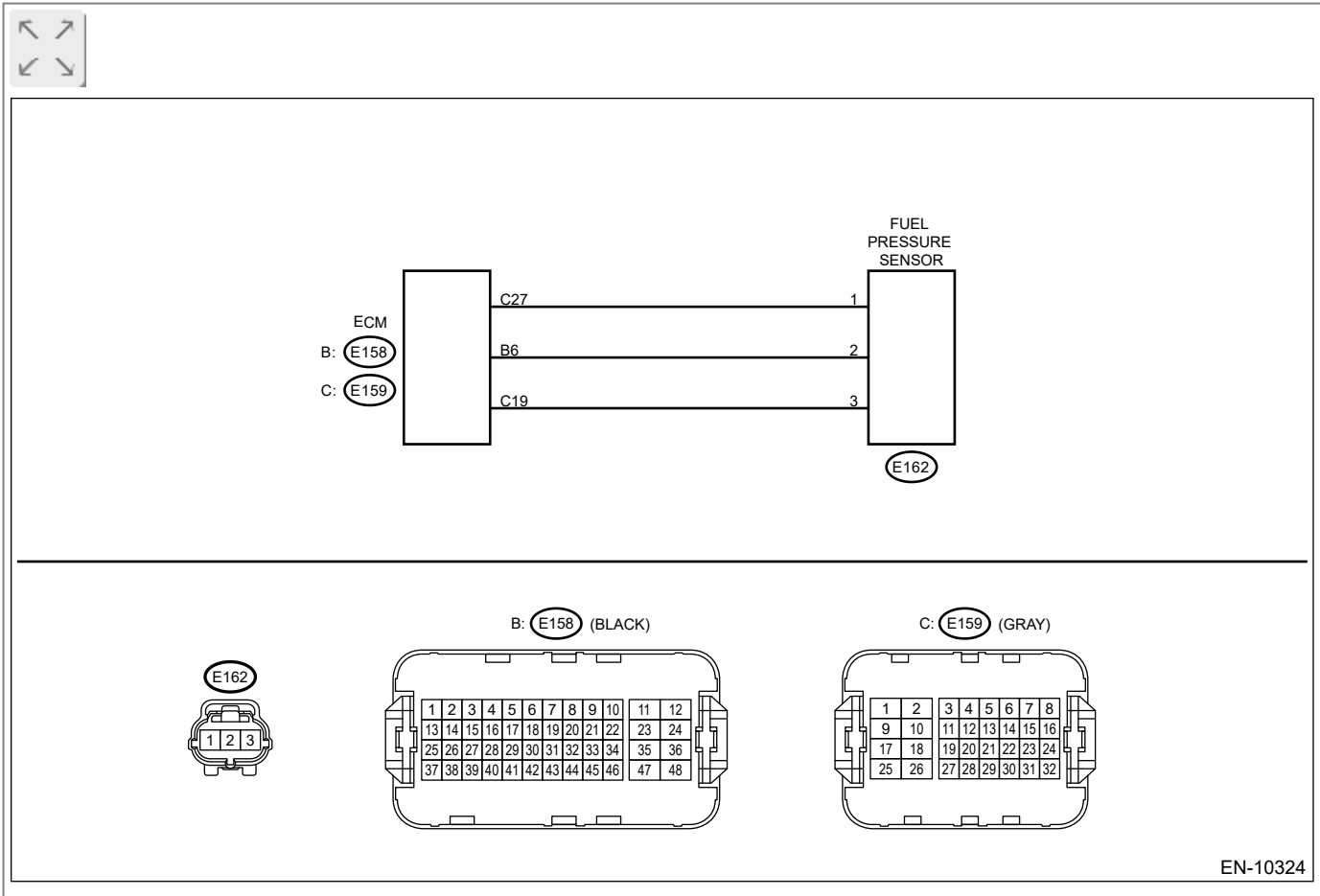
- Improper idling
- Poor driving performance

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK FUEL PRESSURE SENSOR POWER SUPPLY.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the fuel pressure sensor.


3. Turn the ignition switch to ON.
4. Measure the voltage between fuel pressure sensor and engine ground.

Connector & terminal


(E162) No. 3 (+) — Engine ground (-):

Is the voltage 4.5 V or more?

Yes

 [Go to 2.](#)

No

 [Go to 4.](#)

2. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the fuel pressure sensor.
4. Measure the resistance of harness between ECM connector and fuel pressure sensor connector.

Connector & terminal

(E159) No. 27 — (E162) No. 1:

(E158) No. 6 — (E162) No. 2:

Is the resistance less than 1 Ω?

Yes

 [Go to 3.](#)

No

Repair the open circuit in harness between ECM connector and fuel pressure sensor connector.

3. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR.

Measure the resistance between the ECM connector and engine ground.


Connector & terminal

(E158) No. 6 — Engine ground:

(E159) No. 27 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

Replace the fuel pressure sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pressure Sensor.](#)

No

Repair the ground short circuit of harness between ECM connector and fuel pressure sensor connector.

4. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and fuel pressure sensor connector.

Connector & terminal

(E159) No. 19 — (E162) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 5.](#)

No

Repair the open circuit in harness between ECM connector and fuel pressure sensor connector.

5. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR.

Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(E158) No. 19 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

Repair the poor contact of ECM connector.

No

Repair the ground short circuit of harness between ECM connector and fuel pressure sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect the offset of the fuel pressure sensor signal.

Judge as NG when the voltage of fuel pressure sensor after soak time with execution condition met is out of standard.

2. EXECUTION CONDITION

Secondary Parameters	Execution
----------------------	-----------

	condition
Integrated intake air mass during previous driving cycle	> 10000 g
Soak time	> 21600 s
Block heater detection	Complete
Block heater use	Not detected
Engine Coolant Temperature (ECT) continues dropping at each wake up	True*
*As defined by: ECT at this wake up < ECT at last wake up	

3. GENERAL DRIVING CYCLE

Perform the diagnosis only once when the engine starts after a certain period of soaking time.

4. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Minimum HPFR pressure sensor output voltage	> 1.015 V
(Fuel pressure) < 3.863 MPa	
Minimum HPFR pressure sensor output voltage	> 0.232 V
(Fuel pressure) < -2.011 MPa	

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0192 FUEL RAIL PRESSURE SENSOR CIRCUIT LOW BANK 1



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

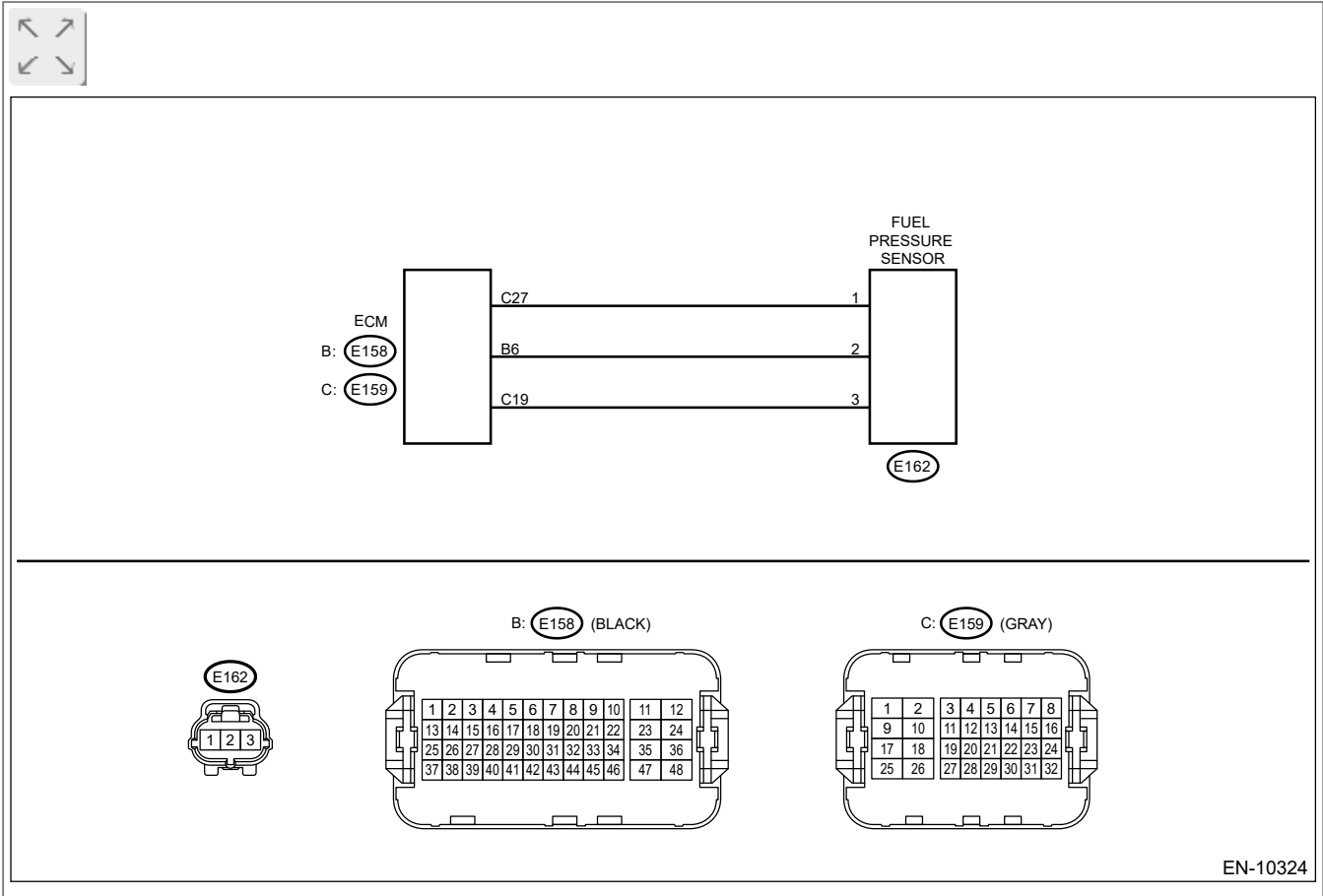
- Improper idling
- Poor driving performance

Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the fuel pressure sensor.


3. Disconnect the connector from ECM.
4. Measure the resistance between ECM and engine ground.

Connector & terminal

(E158) No. 6 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

Replace the fuel pressure sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Pressure Sensor.](#)

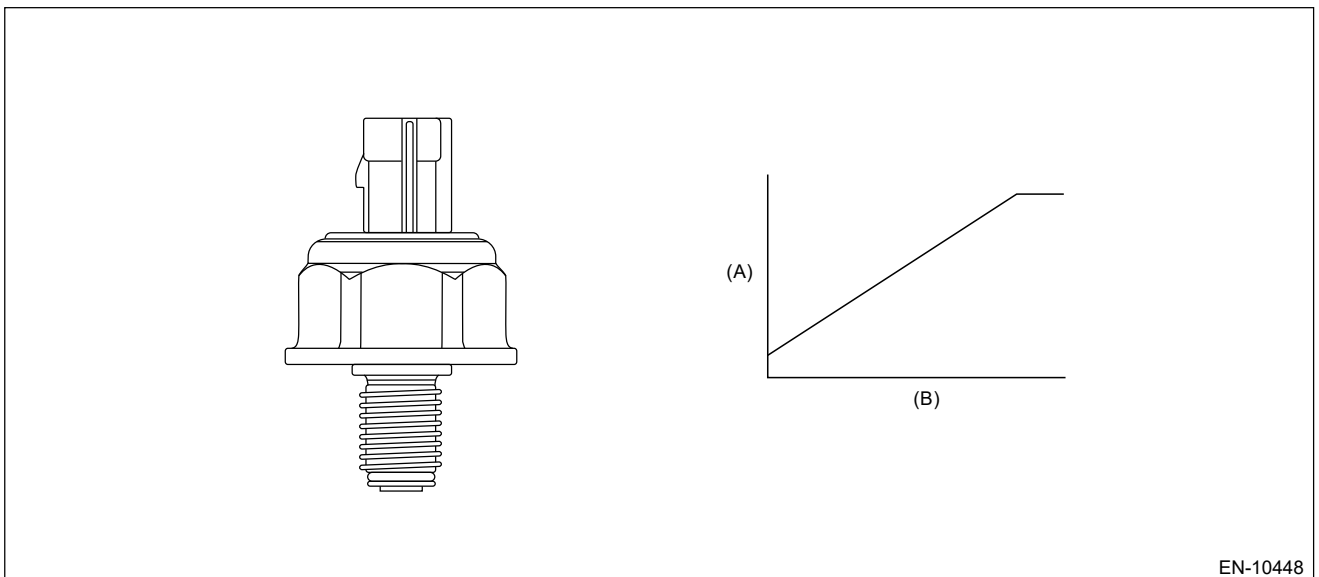
No

Repair the ground short circuit of harness between ECM and fuel pressure sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the fuel pressure sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-10448

(A) Output voltage

(B) Absolute pressure

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	< 0.23 V

Time needed for diagnosis: 5200 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0193 FUEL RAIL PRESSURE SENSOR CIRCUIT HIGH BANK 1



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

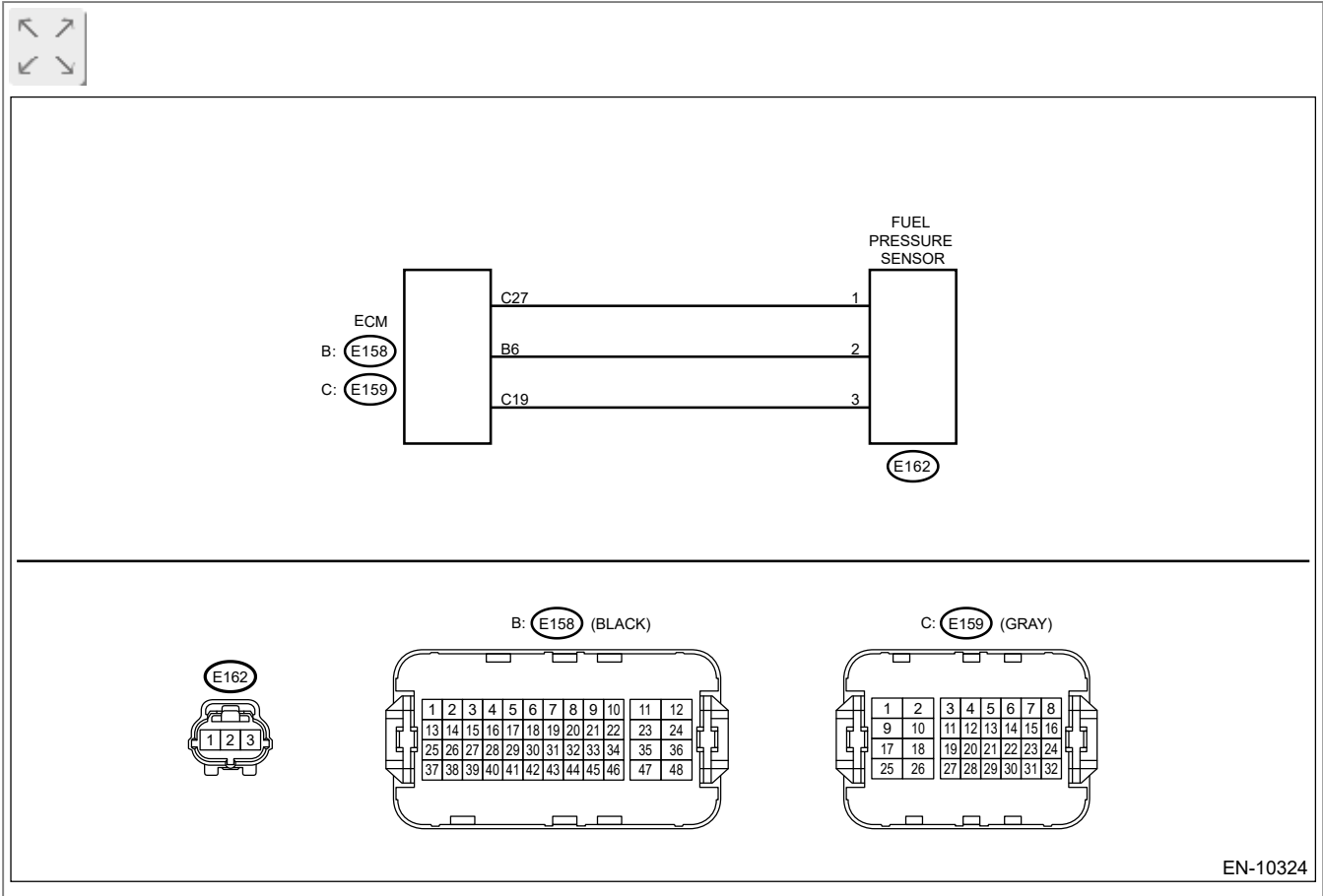
- Improper idling
- Poor driving performance

Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



EN-10324

1. CHECK FOR POOR CONTACT.



Check for poor contact of ECM and fuel pressure sensor connector.

Is there poor contact of the ECM or fuel pressure sensor connector?

Yes

Repair the poor contact of the ECM or fuel pressure sensor connector.

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the fuel pressure sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between the ECM and fuel pressure sensor connector.

Connector & terminal

(E159) No. 27 – (E162) No. 1:

(E158) No. 6 – (E162) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit in harness between ECM and fuel pressure sensor connector.

3. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR.

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM and engine ground.

Connector & terminal


(E158) No. 6 (+) – Engine ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in the harness between ECM and fuel pressure sensor connector.

No

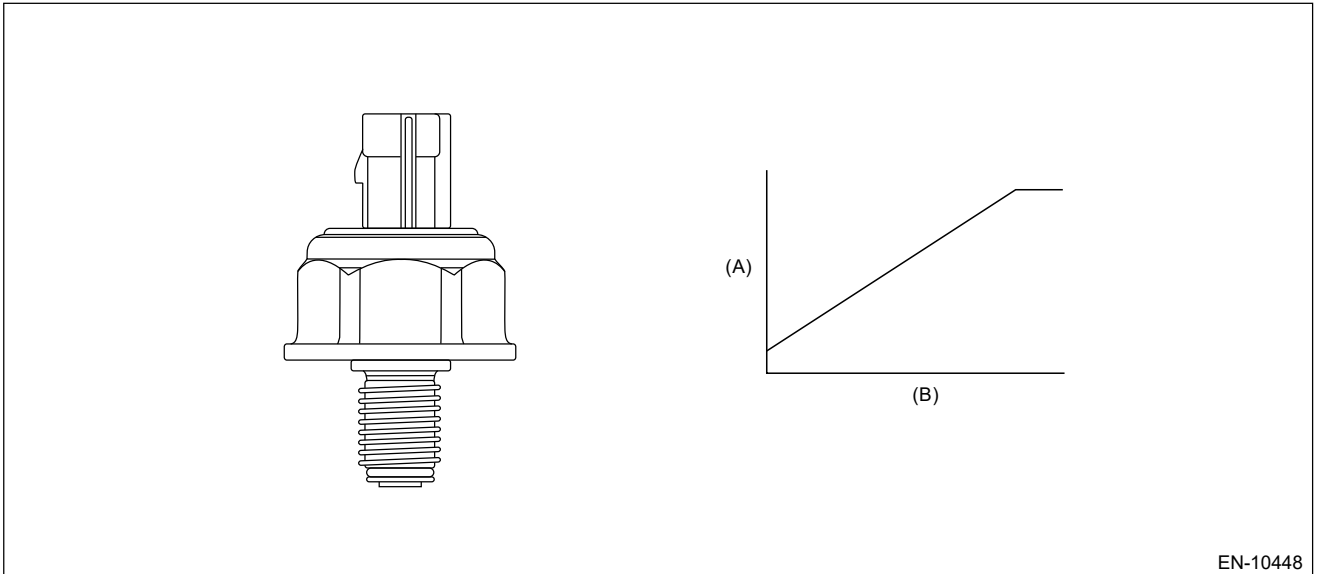
Replace the fuel pressure sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Pressure Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the fuel pressure sensor.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(A) Output voltage

(B) Absolute pressure

EN-10448

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	> 3.25 V

Time needed for diagnosis: 5200 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0196 ENGINE OIL TEMPERATURE SENSOR "A" RANGE/PERFORMANCE



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

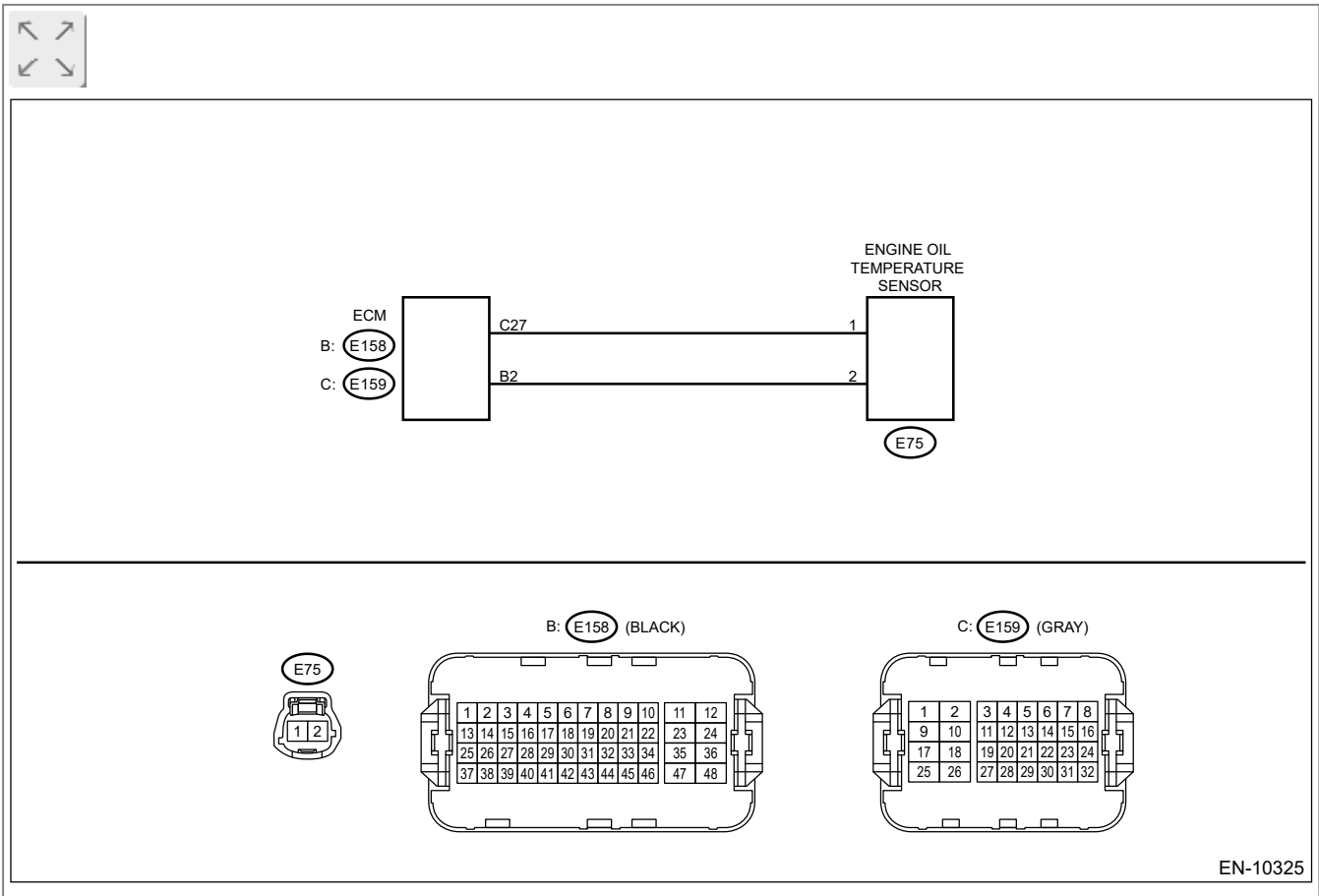
- Hard to start
- Improper idling
- Poor driving performance

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



EN-10325


1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?




Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".

 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 2.](#)

2. CHECK ENGINE OIL TEMPERATURE SENSOR.

1. Disconnect the connectors from the engine oil temperature sensor.
2. Measure the resistance between engine oil temperature sensor terminals when the engine is cold and after warmed up.

Terminals


No. 1 — No. 2:

Is the resistance of engine oil temperature sensor different between when engine is cold and after warmed up?

Yes

Repair the poor contact of ECM connector.

No

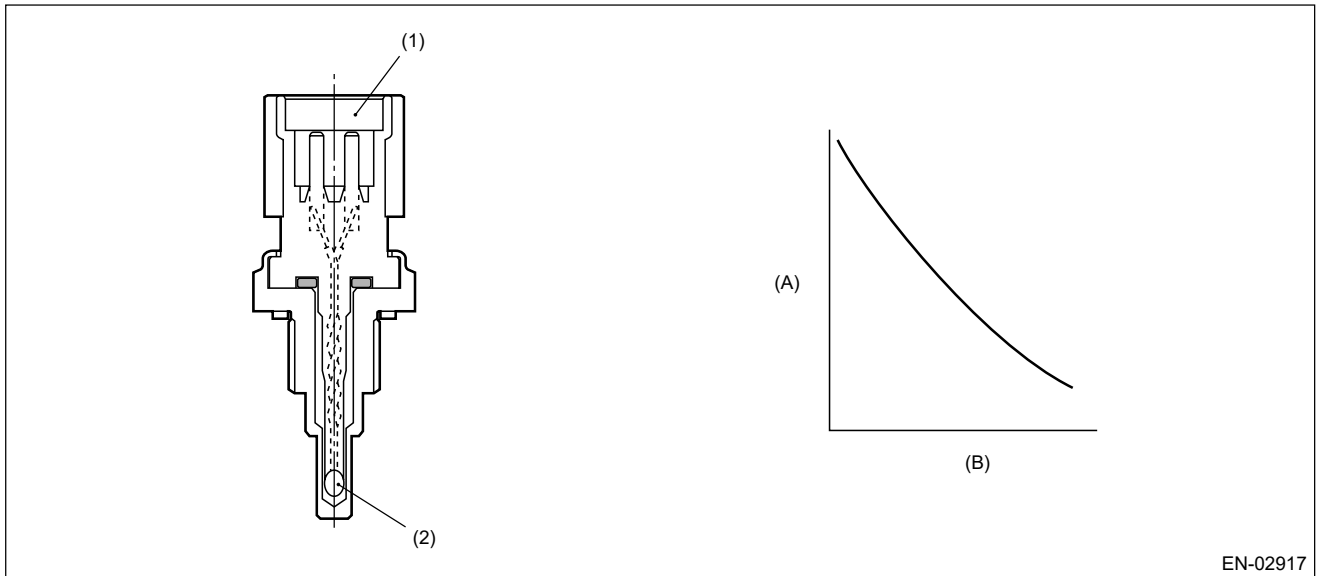
Replace the engine oil temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Oil Temperature Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of the engine oil temperature sensor output properties. Using the following two diagnoses, judge as NG when either is NG.

- **Diagnosis 1 (correlation diagnosis):** After the engine starts after the specified period of soaking time has elapsed, diagnose by correlation between engine oil temperature sensor value, engine coolant temperature sensor value and intake air temperature sensor value. Judge as NG when the differences are both above the specified value by comparing between engine oil temperature and engine coolant temperature, engine oil temperature and intake air temperature.
- **Diagnosis 2 (function diagnosis):** Judge as NG when engine oil temperature does not rise to the specified value regardless of an engine running condition that clears certain conditions.

2. COMPONENT DESCRIPTION



(A) Resistance value (kΩ) (B) Temperature °C (°F)
 (1) Connector (2) Thermistor element

EN-02917

3. EXECUTION CONDITION

Diagnosis 1

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Soaking time	≥ 21600 s
Block heater judgment	Completed
Block heater operation	Not in operation

Diagnosis 2

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Engine oil temperature at engine starting	< 50°C (122°F)
Engine speed	≥ 475 rpm
Idling ratio	≤ 50%

4. GENERAL DRIVING CYCLE

- **Diagnosis 1:** Perform the diagnosis only once after the engine starts after a certain period of soaking time.
- **Diagnosis 2:** Perform the diagnosis only once after starting the engine from cold condition.

5. DIAGNOSTIC METHOD

Judge as NG when Diagnosis 1 or Diagnosis 2 becomes NG.

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Diagnosis 1**Judgment value**

Malfunction Criteria	Threshold Value
Engine oil temperature at engine start – Engine coolant temperature at engine start	> 10°C (18°F)
Engine oil temperature at engine start – Intake air temperature 30 sec. after engine start	> Value of Map 1

Map 1

Ambient temperature °C (°F)	-30 (-22)	30 (86)	45 (113)	60 (140)
Engine oil temperature at engine start – Intake air temperature 30 sec. after engine start °C (°F)	10 (18)	10 (18)	22 (39.6)	22 (39.6)

Time needed for diagnosis: Less than 1 second**Diagnosis 2****Judgment value**

Malfunction Criteria	Threshold Value
Engine oil temperature	< 50°C (122°F)
Elapsed time after starting the engine	≥ Value of Map 2

Map 2

Intake air temperature at engine start °C (°F)	-30 (-22)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)
Elapsed time after starting the engine s	2,800	2,100	1,400	900	650	500	400	400

Time needed for diagnosis: Less than 1 second**Malfunction indicator light illumination:** Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0197 ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT LOW



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

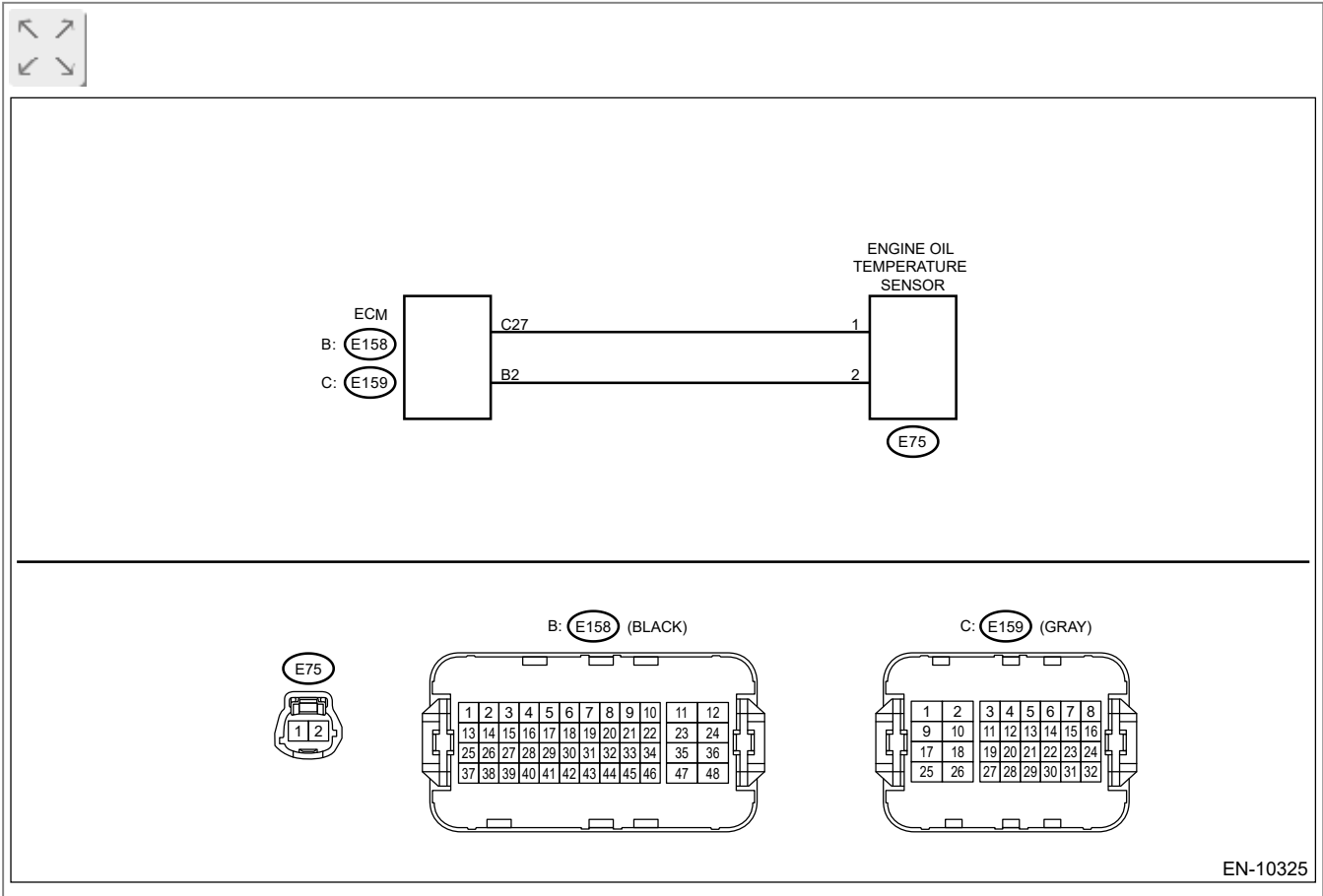
- Hard to start
- Improper idling
- Poor driving performance

Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.




EN-10325

1. CHECK CURRENT DATA.

1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Engine Oil


Temperature].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Engine Oil Temperature] 150°C (302°F) or more?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN ECM AND ENGINE OIL TEMPERATURE SENSOR CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the engine oil temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM and engine ground.

Connector & terminal

(E158) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

Replace the engine oil temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Oil Temperature Sensor.](#)

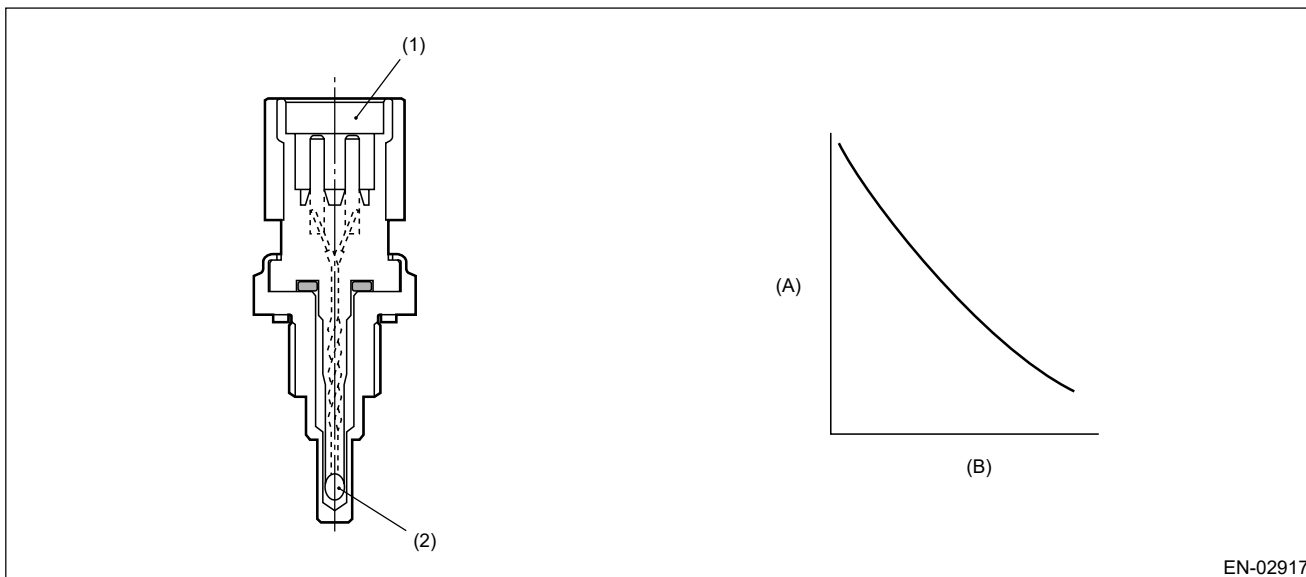
No

Repair the short circuit to ground in the harness between the ECM and engine oil temperature sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the oil temperature sensor.
Judge as NG when outside of the judgment value.

2. COMPONENT DESCRIPTION



- (A) Resistance value (kΩ)
- (B) Temperature °C (°F)
- (1) Connector
- (2) Thermistor element

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	< 0.18 V

Time needed for diagnosis: 500 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0198 ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT HIGH



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

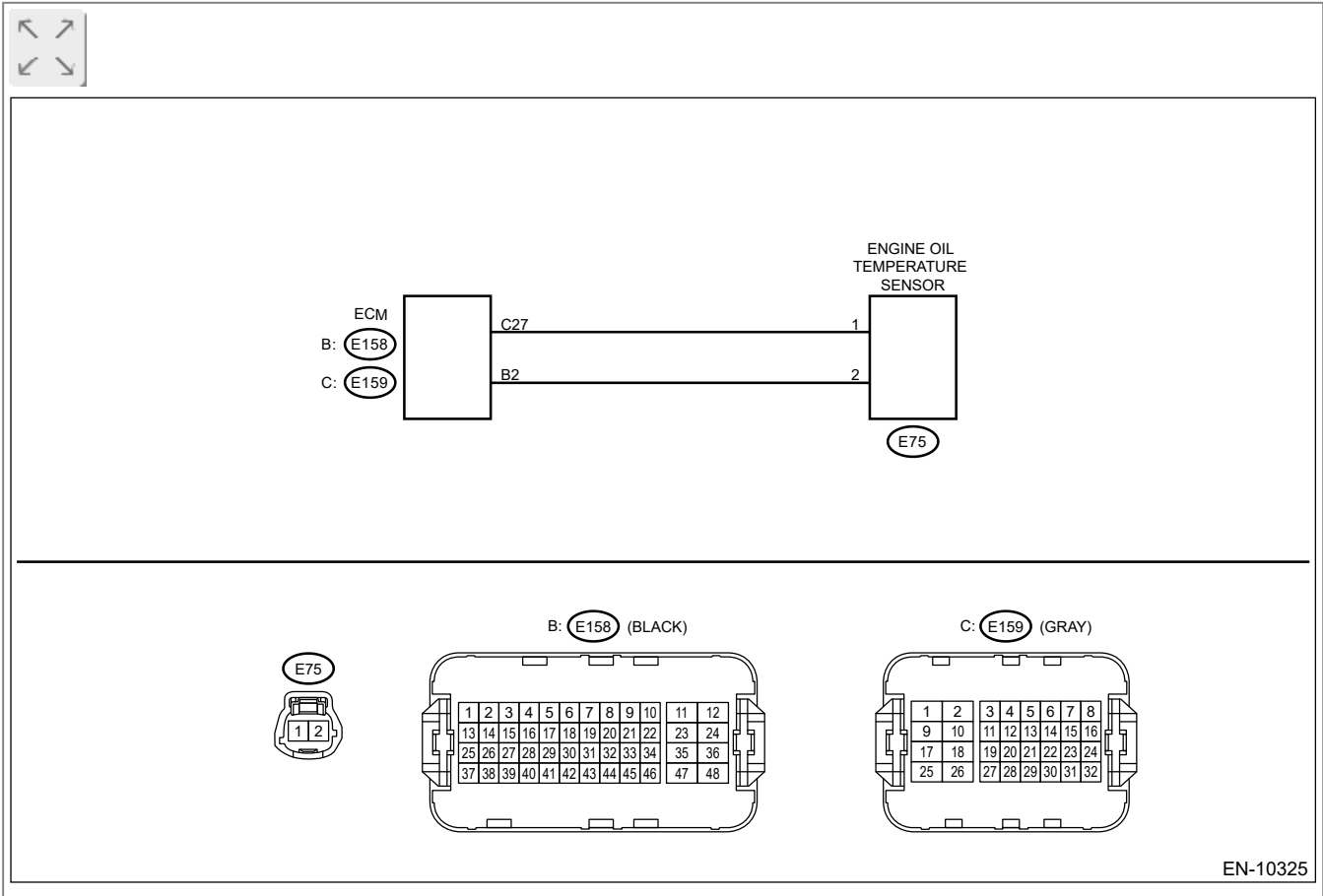
- Hard to start
- Improper idling
- Poor driving performance

Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.




1. CHECK CURRENT DATA.

1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Engine Oil


Temperature].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Engine Oil Temperature] -40°C (-40°F) or less?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK FOR POOR CONTACT.

Check for poor contact between the ECM and engine oil temperature sensor connectors.

Is there poor contact of the ECM or engine oil temperature sensor connectors?

Yes

Repair the poor contact of ECM or engine oil temperature sensor connector.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND ENGINE OIL TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the engine oil temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of the harness between the ECM and engine oil temperature sensor connector.

Connector & terminal

(E159) No. 27 — (E75) No. 1:

(E158) No. 2 — (E75) No. 2:

Is the resistance less than $1\ \Omega$?

 [Go to 4.](#)

Yes

No

Repair the open circuit in the harness between the ECM and engine oil temperature sensor connector.

4. CHECK HARNESS BETWEEN ECM AND ENGINE OIL TEMPERATURE SENSOR CONNECTOR.



1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM and engine ground.

Connector & terminal


(E158) No. 2 (+) — Engine ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in harness between ECM and engine oil temperature sensor connector.

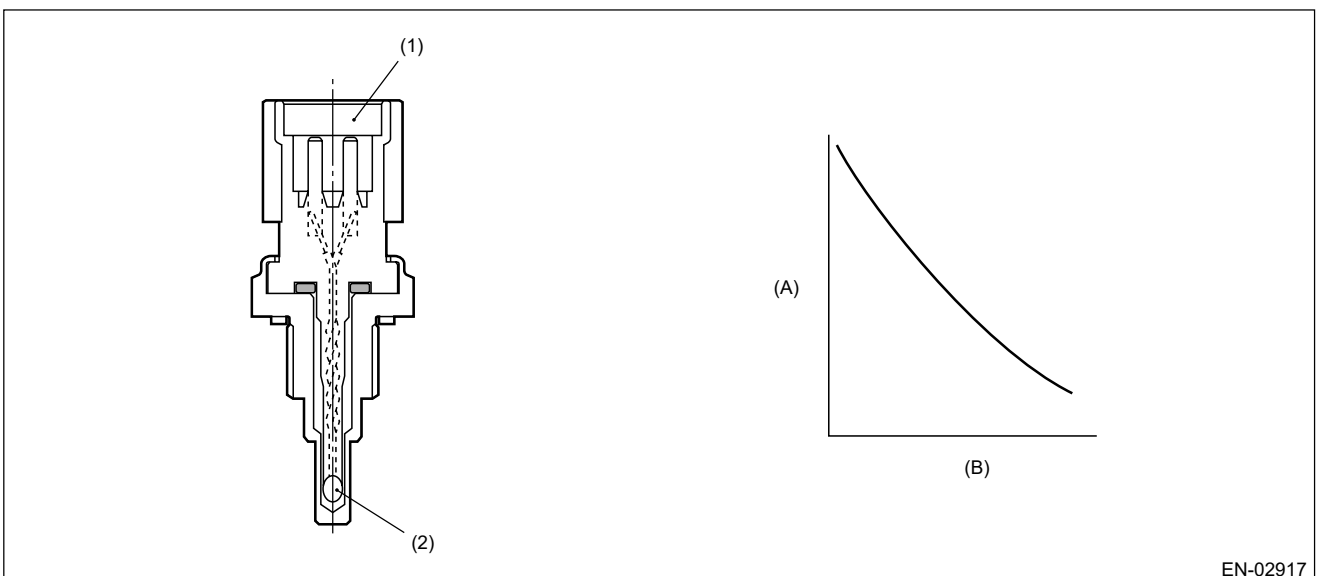
No

Replace the engine oil temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Oil Temperature Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the oil temperature sensor.
Judge as NG when outside of the judgment value.

2. COMPONENT DESCRIPTION



EN-02917

(A) Resistance value (k Ω)

(B) Temperature $^{\circ}\text{C}$ ($^{\circ}\text{F}$)

(1) Connector

(2) Thermistor element

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	> 4.71 V

Time needed for diagnosis: 500 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0222 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance
- Engine stalls.

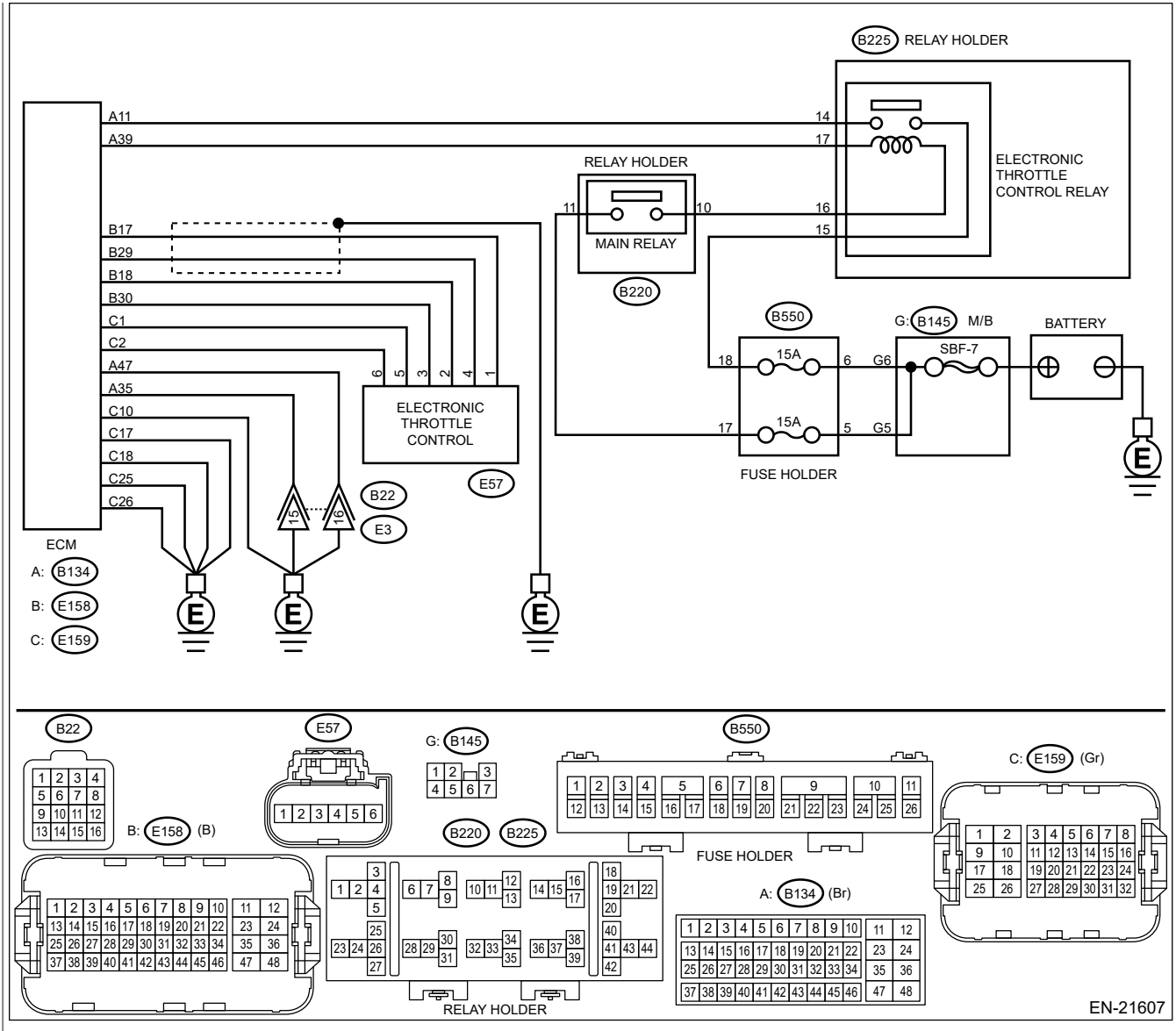
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21607

1. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connectors from electronic throttle control.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM and engine ground.

Connector & terminal

- (E158) No. 18 — Engine ground:
- (E158) No. 29 — Engine ground:
- (E158) No. 29 — (E158) No. 28:

Is the resistance 1 MΩ or more?

Yes

Go to 2.

No

Repair the short circuit to ground in harness between ECM and electronic throttle control connector.

2. CHECK SHORT CIRCUIT INSIDE THE ECM.




1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal


(E57) No. 4 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

Replace the electronic throttle control.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Throttle Body.](#)

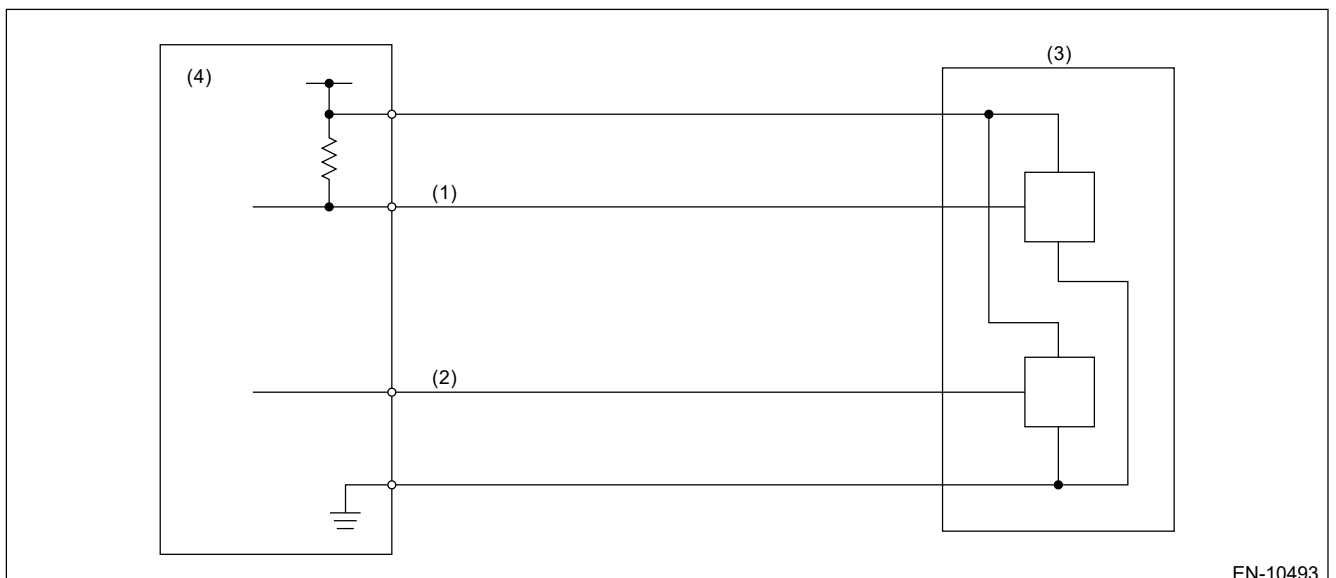
No

Repair the short circuit to ground in harness between ECM and electronic throttle control connector. Replace the ECM if defective.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of throttle position sensor 2.

2. COMPONENT DESCRIPTION



EN-10493

(1) Throttle position sensor 1
signal

(3) Throttle position sensor

(4) Engine control module (ECM)

(2) Throttle position sensor 2
signal

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 6\text{ V}$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 2 input voltage	$< 0.37\text{ V}$

Time needed for diagnosis: 100 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0223 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT HIGH



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance
- Engine stalls.

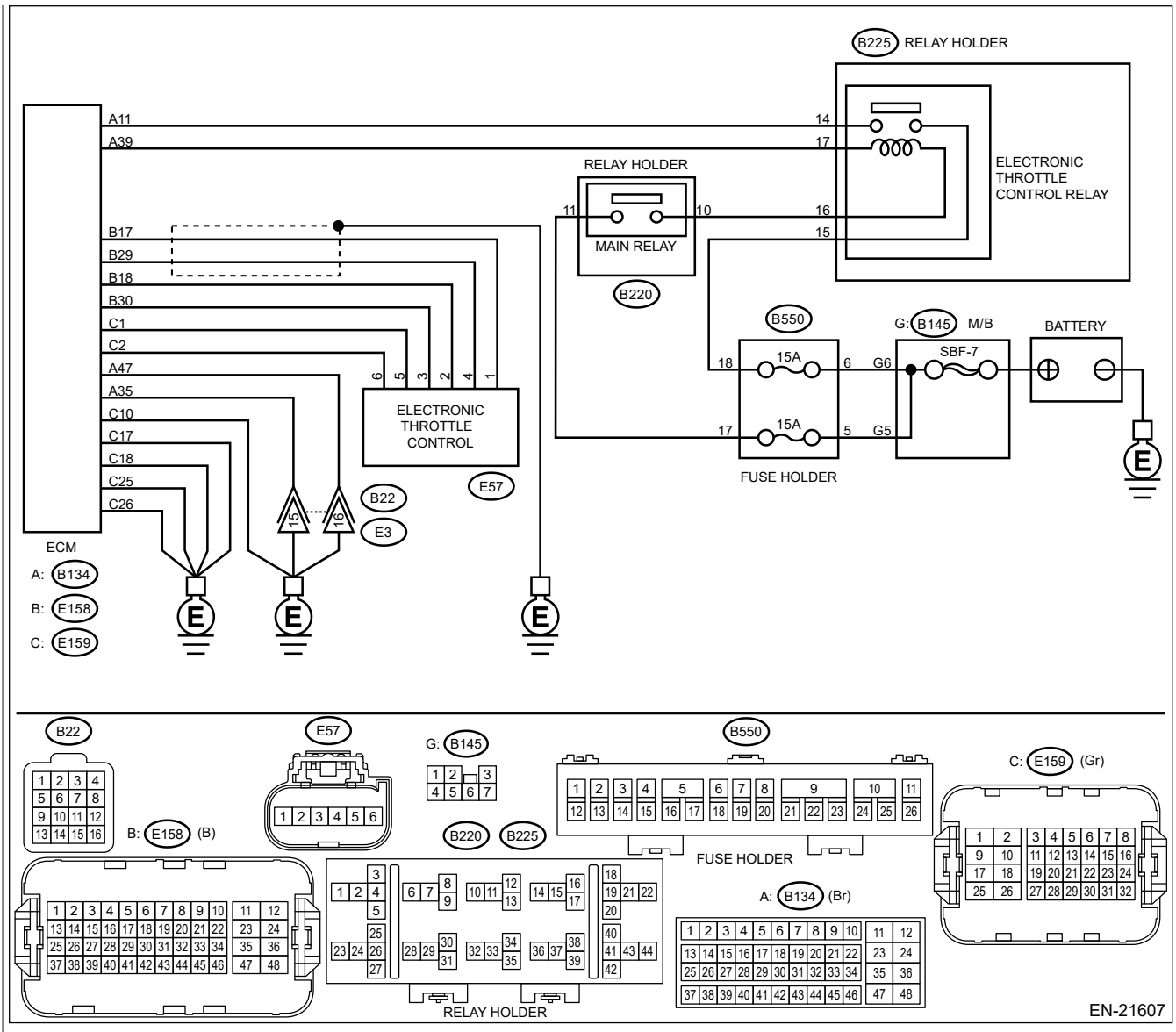
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





1. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from electronic throttle control.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and electronic throttle control connector.

Connector & terminal

- (E158) No. 29 — (E57) No. 4:
- (E158) No. 30 — (E57) No. 3:

Is the resistance less than 1 Ω?

Yes

[Go to 2.](#)

No

Repair the open circuit of harness between ECM and electronic throttle control connector.

2. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.


1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 3 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM and engine ground**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to ON.
2. Measure the voltage between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 4 (+) — Engine ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in harness between ECM and electronic throttle control connector.

No

 [Go to 4.](#)

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.


3. Measure the resistance between ECM connectors.

Connector & terminal

(E158) No. 18 — (E158) No. 29:

Is the resistance 1 MΩ or more?

Yes

Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Throttle Body.](#)

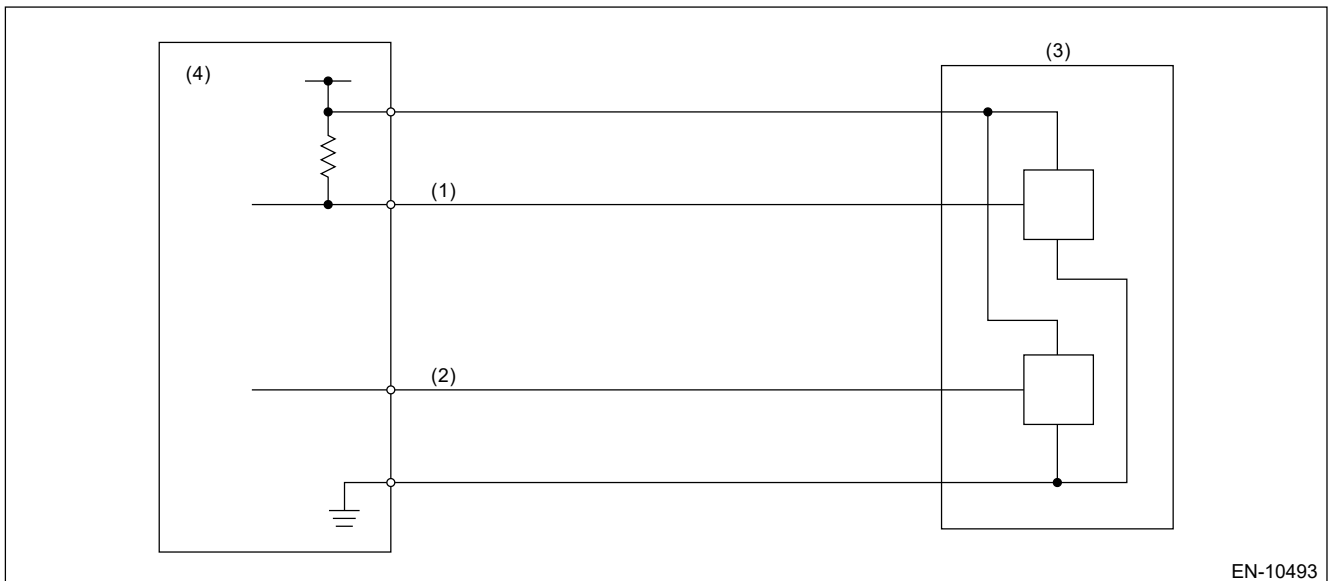
No

Repair the short circuit to power in harness between ECM and electronic throttle control connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of throttle position sensor 2.

2. COMPONENT DESCRIPTION



(1) Throttle position sensor 1 signal

(3) Throttle position sensor

(4) Engine control module (ECM)

(2) Throttle position sensor 2 signal

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 6 \text{ V}$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 2 input voltage	> 4.82 V

Time needed for diagnosis: 100 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0230 FUEL PUMP PRIMARY CIRCUIT

DTC detecting condition:

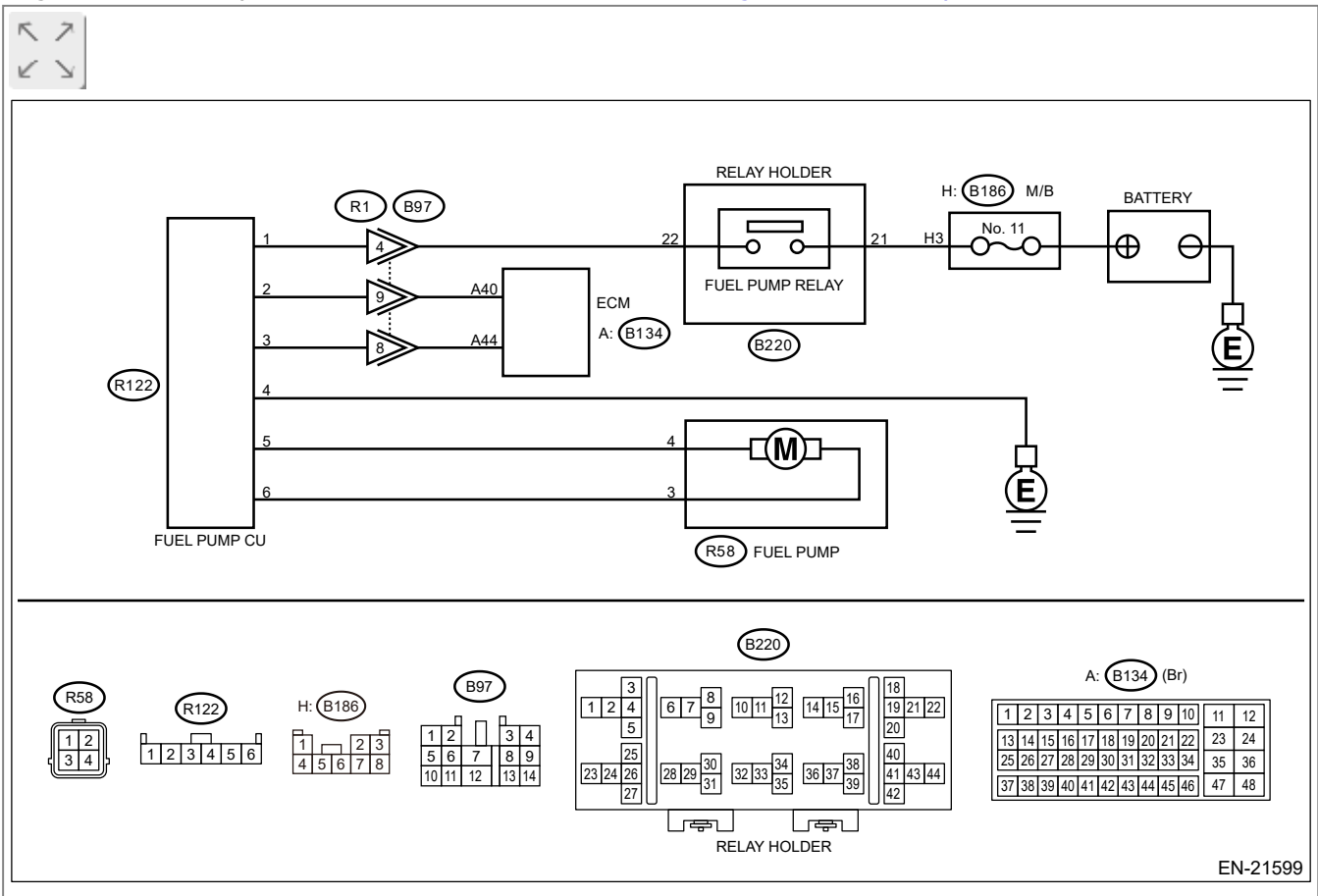
Detected when two consecutive driving cycles with fault occur.

Caution:

- After servicing or replacing faulty parts, perform Clear Memory Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK POWER SUPPLY CIRCUIT TO FUEL PUMP CONTROL UNIT.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel pump control unit.
3. Turn the ignition switch to ON.
4. Measure the voltage between fuel pump control unit connector and engine ground.

Connector & terminal

(R122) No. 1 (+) – Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

Repair the power supply circuit.

Note:

In this case, repair the following item:

- **Open circuit or short circuit to ground in harness between fuel pump relay connector and fuel pump control unit connector**
- **Poor contact of fuel pump control unit connector**
- **Poor contact of fuel pump relay connector**
- **Poor contact of coupling connector**

2. CHECK GROUND CIRCUIT OF FUEL PUMP CONTROL UNIT.

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between fuel pump control unit connector and engine ground.

Connector & terminal

(R122) No. 4 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit between fuel pump control unit connector and engine ground.

3. CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND FUEL PUMP CONNECTOR.

1. Disconnect the connector from fuel pump.
2. Measure the resistance of harness between fuel pump control unit and fuel pump connector.


Connector & terminal

(R122) No. 5 — (R58) No. 4:

(R122) No. 6 — (R58) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Repair the open circuit in harness between fuel pump control unit connector and

fuel pump connector.

4. CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND FUEL PUMP CONNECTOR.

Measure the resistance between fuel pump control unit connector and engine ground.

Connector & terminal

(R122) No. 5 — Engine ground:

(R122) No. 6 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between fuel pump control unit connector and fuel pump connector.

5. CHECK HARNESS BETWEEN ECM AND FUEL PUMP CONTROL UNIT CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM and fuel pump control unit connector.

Connector & terminal

(B134) No. 40 — (R122) No. 2:

(B134) No. 44 — (R122) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 6.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and fuel pump control unit connector**
- **Poor contact of coupling connector**

6. CHECK HARNESS BETWEEN ECM AND FUEL PUMP CONTROL UNIT CONNECTOR.

Measure the resistance between fuel pump control unit connector and engine ground.


Connector & terminal

(R122) No. 2 — Engine ground:

(R122) No. 3 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 7.](#)

No

Repair the short circuit to ground in harness between ECM and fuel pump control unit connector.

7. CHECK FOR POOR CONTACT.



Check for poor contact of ECM and fuel pump control unit connector.

Is there poor contact of ECM or fuel pump control unit connector?

Yes

Repair the poor contact of ECM or fuel pump control unit connector.

No

 [Go to 8.](#)

8. CHECK EXPERIENCE OF RUNNING OUT OF FUEL.



Has the vehicle experienced running out of fuel?

Yes

Finish the diagnosis.

Note:

DTC may be recorded as a result of fuel pump idling while running out of fuel.

No

Replace the fuel pump control unit.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pump Control Unit.](#)

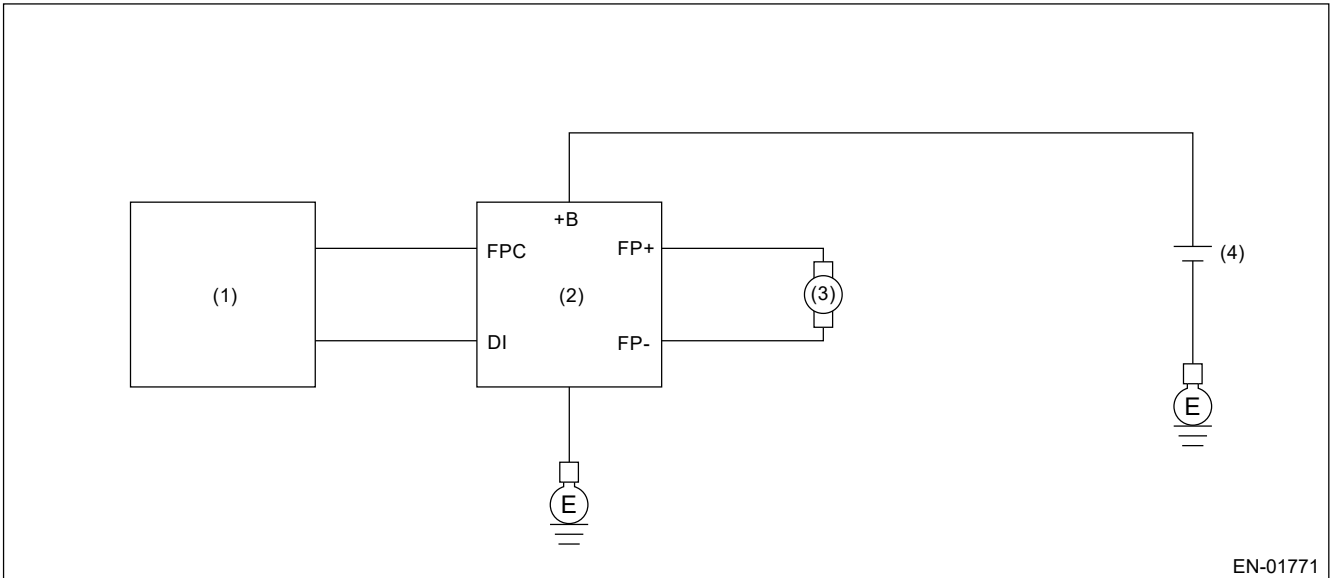
1. OUTLINE OF DIAGNOSIS

Detect the malfunction of fuel pump control unit.

Judge as NG when the NG signal is sent through a diagnostic line coming from the fuel pump control unit.

Fuel pump control unit detects the open or short circuit malfunction for each line, and then sends NG signals if one of them is found NG.

2. COMPONENT DESCRIPTION



- (1) Engine control module (ECM) (3) Fuel pump (4) Battery
 (2) Fuel pump control unit

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 8 \text{ V}$
Fuel level	$\geq 15\%$
Elapsed time after starting the engine	$\geq 180 \text{ s}$
Fuel pump controller control mode	ON

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Fuel pump control unit output diagnosis signal	$< 1.5 \text{ V}$

Time needed for diagnosis: 2520 ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.


ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P023F FUEL PUMP SECONDARY CIRCUIT/OPEN

DTC detecting condition:

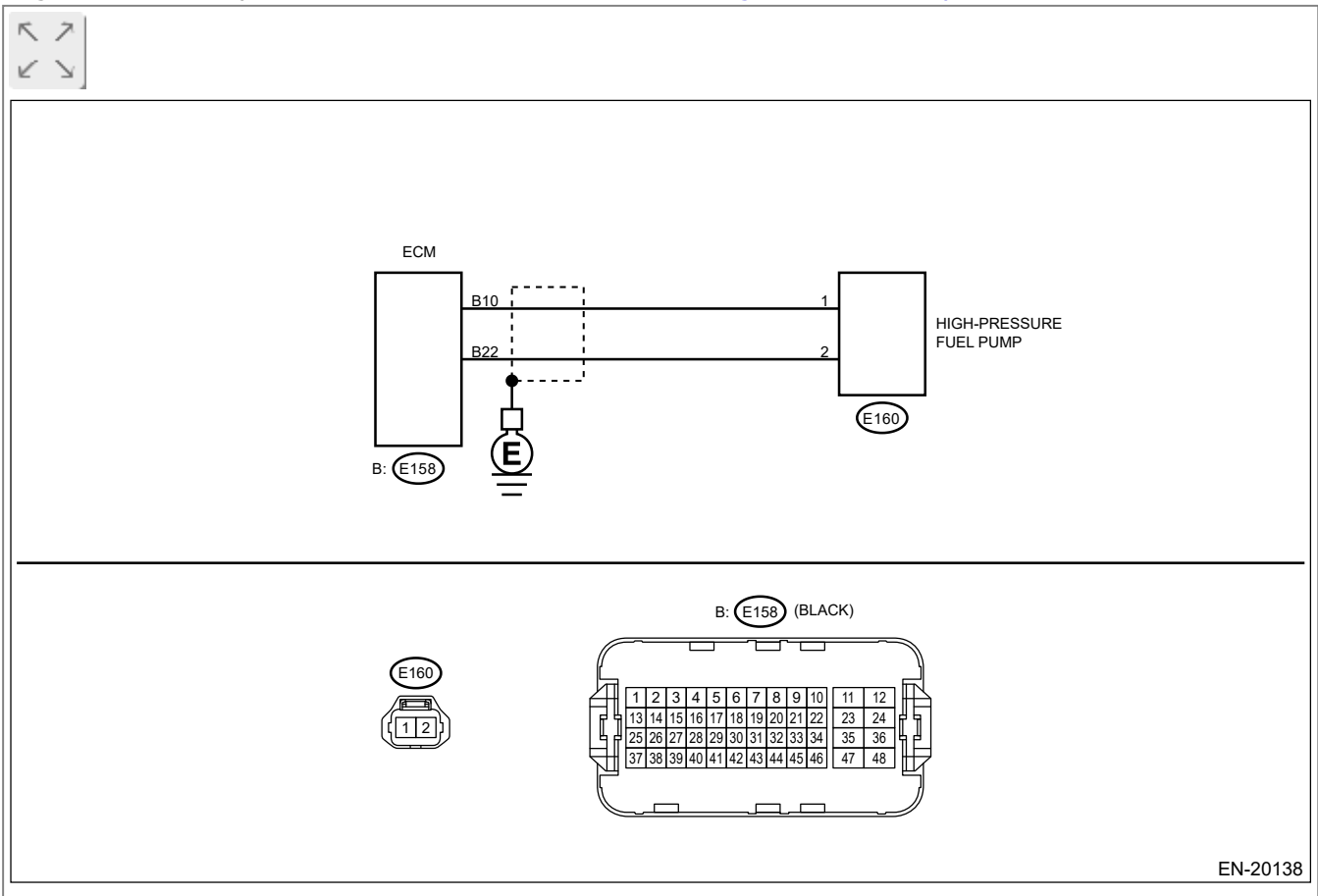
Immediately at fault recognition

Caution:


- After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode. and Inspection Mode !\[\]\(2c0783baf87a2728b2fe49eb1c34c456_img.jpg\) Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)




1. CHECK HIGH-PRESSURE FUEL PUMP.


Check the high-pressure fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>High Pressure Fuel Pump>INSPECTION.](#)

Is the high-pressure fuel pump normal?

Yes

 [Go to 2.](#)

No

Replace the high-pressure fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>High Pressure Fuel Pump.](#)

2. CHECK HARNESS BETWEEN ECM AND HIGH-PRESSURE FUEL PUMP CONNECTOR.

1. Disconnect the connector from ECM.
2. Disconnect the connector from high-pressure fuel pump.
3. Measure the resistance of harness between ECM and high-pressure fuel pump connector.

Connector & terminal

(E158) No. 10 — (E160) No. 1:

(E158) No. 22 — (E160) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit in harness between ECM and high-pressure fuel pump connector.

3. CHECK HARNESS BETWEEN ECM AND HIGH-PRESSURE FUEL PUMP CONNECTOR.

Measure the resistance between high-pressure fuel pump connector and engine ground.

Connector & terminal

(E160) No. 1 — Engine ground:

(E160) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

Repair the poor contact of ECM connector.

No

Repair the short circuit to ground in harness between ECM and high-pressure fuel pump connector.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of high pressure fuel pump circuit function.

Judge as NG when ECM detects any malfunction in the diagnostic items listed below.

Diagnostic item	Malfunction Criteria
Power supply short	ECM low side terminal voltage of the high pressure fuel pump circuit is high.
Ground short	ECM low side terminal voltage of the high pressure fuel pump

	circuit is low.
Open circuit	High pressure fuel pump current is low.
Overcurrent	High pressure fuel pump current is high.
Short circuit	The time when the high pressure fuel pump current reaches the target current is short.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 9.4 \text{ V}$
Engine speed	$> 0 \text{ rpm}$
Elapsed time after fuel pump current shutdown (Only power supply short diagnosis and ground short diagnosis)	$\geq 3.15 \text{ ms}$

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

DIAGNOSIS FOR POWER SUPPLY SHORT

Judgment value

Malfunction Criteria	Threshold Value
Terminal voltage	$\geq 4.1 \text{ V}$

DIAGNOSIS FOR GROUND SHORT

Judgment value

Malfunction Criteria	Threshold Value
Terminal voltage	$\leq 0.8 \text{ V}$

DIAGNOSIS FOR OPEN CIRCUIT

Judgment value

Malfunction Criteria	Threshold Value
Fuel pump current	$\leq 0.5 \text{ A}$

DIAGNOSIS FOR OVERCURRENT

Judgment value

Malfunction Criteria	Threshold Value
Fuel pump current	$\geq 22\text{A}$

DIAGNOSIS FOR SHORT CIRCUIT

Judgment value

--	--

Malfunction Criteria	Threshold Value
Time for reaching target current	≤ 0.075 ms

Time needed for diagnosis: TDC \times 75 times

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0244 TURBOCHARGER/SUPERCHARGER WASTEGATE SOLENOID "A" RANGE/PERFORMANCE



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

Poor driving performance


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..


1. CHECK FOR ANY OTHER DTC ON DISPLAY. 

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".
 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>List of Diagnostic Trouble Code (DTC).

No

 Go to 2.


2. CHECK WASTEGATE ACTUATOR PIPING AND WASTEGATE CONTROL SOLENOID VALVE PIPING. 

Are there any damage or disconnection of hose in wastegate actuator piping or wastegate control solenoid valve piping?

Yes

Connect the wastegate actuator pipe or wastegate control solenoid valve pipe properly. If defective, replace the hose.

No

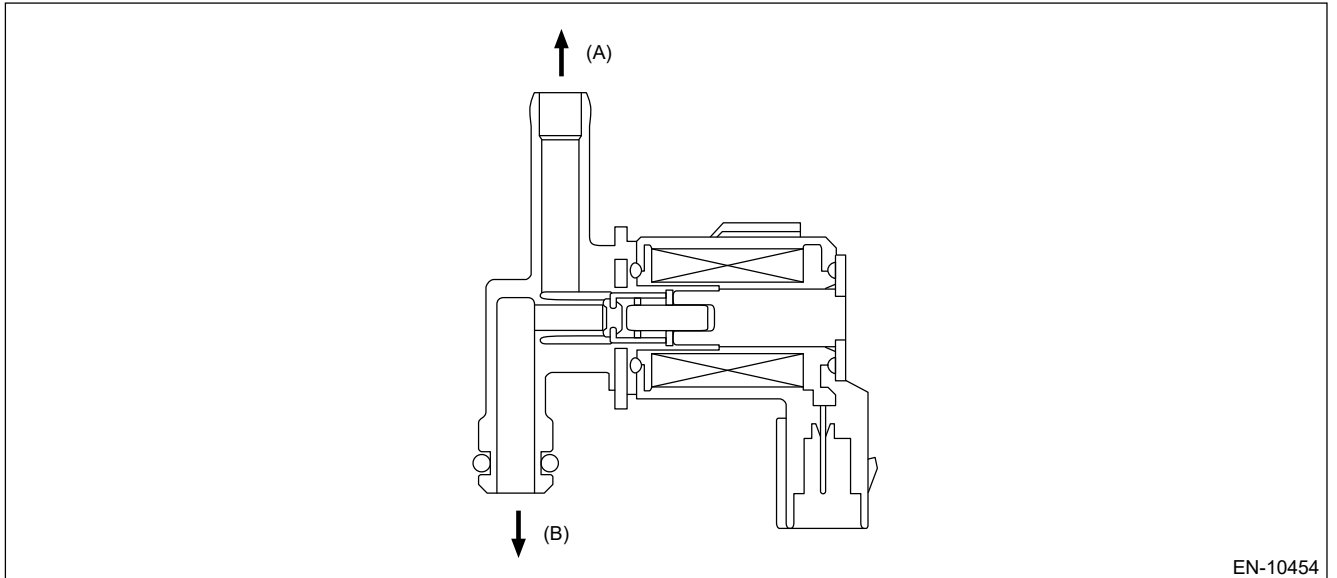
Replace the wastegate control solenoid valve.  Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Wastegate Control Solenoid Valve.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of wastegate control solenoid valve function.

Judge as NG when becoming high wastegate pressure.

2. COMPONENT DESCRIPTION



EN-10454

(A) Turbocharger

(B) Intake duct

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Intake manifold pressure	> Value from Map

Map

		Atmospheric pressure kPa (mmHg, inHg)							
		64 (480, 18.9)	70.6 (529.5, 20.8)	77.3 (579.8, 22.8)	84 (630.1, 24.8)	90.6 (679.6, 26.8)	93.3 (699.8, 27.6)	96 (720.1, 28.3)	97.3 (729.8, 28.7)
Engine speed (rpm)	1600	204.7 (1535.6, 60.5)	204.7 (1535.6, 60.5)	204.7 (1535.6, 60.5)	204.7 (1535.6, 60.5)	204.7 (1535.6, 60.5)	204.7 (1535.6, 60.5)	204.7 (1535.6, 60.5)	204.7 (1535.6, 60.5)
	2400	223.7 (1677.9, 66.1)	223.7 (1677.9, 66.1)	223.7 (1677.9, 66.1)	223.7 (1677.9, 66.1)	223.7 (1677.9, 66.1)	223.7 (1677.9, 66.1)	223.7 (1677.9, 66.1)	223.7 (1677.9, 66.1)
	3200	219.2	223.3	229.6	233.7	233.7	233.7	233.7	233.7

	(1644.1, 64.7)	(1674.9, 65.9)	(1722.1, 67.8)	(1752.9, 69)	(1752.9, 69)	(1752.9, 69)	(1752.9, 69)	(1752.9, 69)
400 0	204.3 (1532.4, 60.3)	210.7 (1580.4, 62.2)	220.4 (1653.1, 65.1)	236.4 (1773.2, 69.8)	240.7 (1805.4, 71.1)	240.7 (1805.4, 71.1)	240.7 (1805.4, 71.1)	240.7 (1805.4, 71.1)
480 0	190.9 (1431.9, 56.4)	201.9 (1514.4, 59.6)	213.5 (1601.4, 63)	234.7 (1760.4, 69.3)	245.7 (1842.9, 72.6)	245.7 (1842.9, 72.6)	245.7 (1842.9, 72.6)	245.7 (1842.9, 72.6)
560 0	155.1 (1163.3, 45.8)	176.5 (1323.9, 52.1)	187.2 (1404.1, 55.3)	208.6 (1564.6, 61.6)	219.3 (1644.9, 64.8)	234.3 (1757.4, 69.2)	240.7 (1805.4, 71.1)	240.7 (1805.4, 71.1)
kPa (mmHg, inHg)								

Time needed for diagnosis: 2000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0245 TURBOCHARGER/SUPERCHARGER WASTEGATE SOLENOID "A" LOW



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

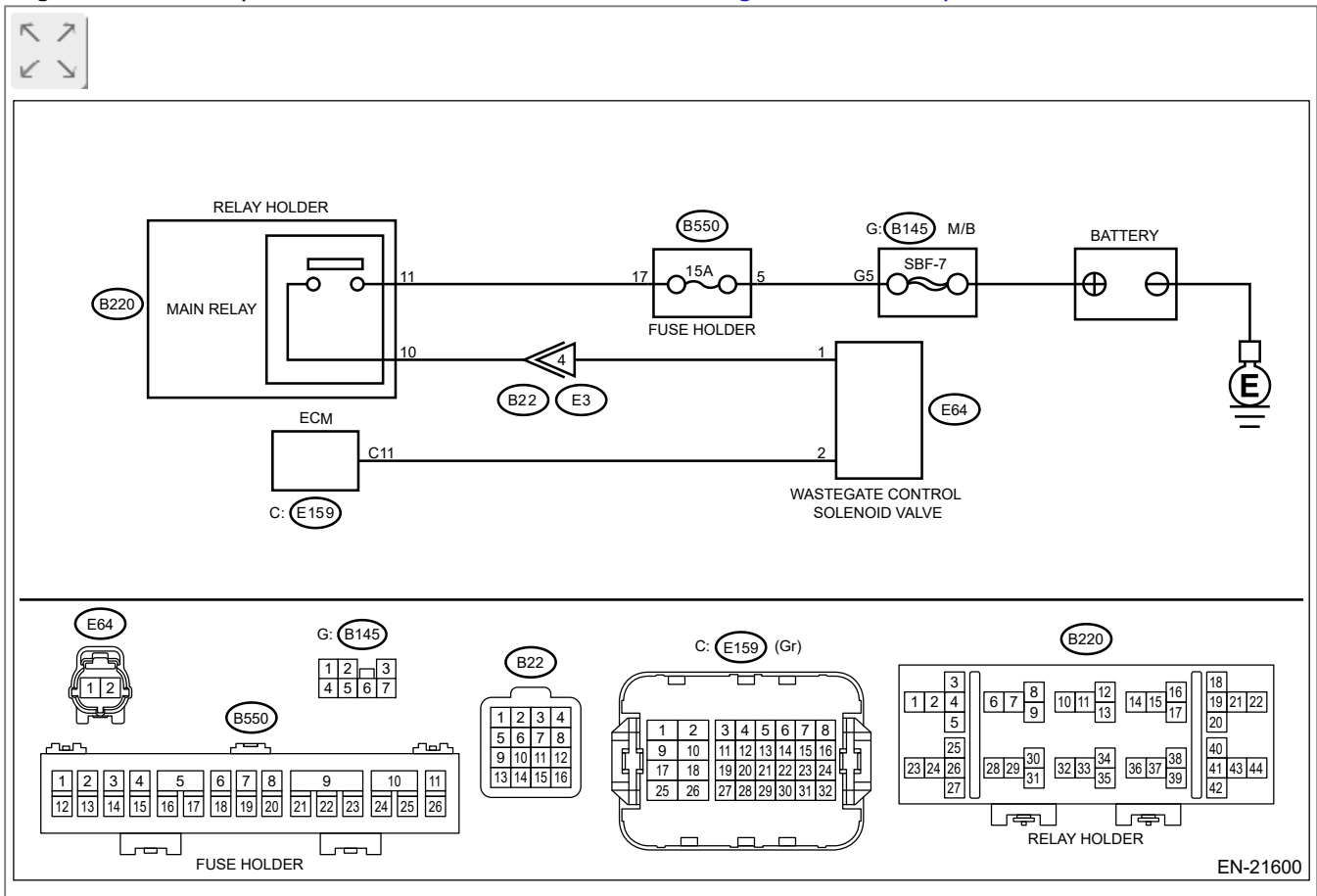
Poor driving performance

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK OUTPUT SIGNAL OF ECM.


1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and engine ground.

Connector & terminal

(E159) No. 11 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

 [Go to 3.](#)

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes

Repair the poor contact of ECM connector.

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

3. CHECK POWER SUPPLY TO WASTEGATE CONTROL SOLENOID VALVE.

Measure the voltage between wastegate control solenoid valve connector and engine ground.

Connector & terminal

(E64) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

Repair the power supply circuit.

4. CHECK HARNESS BETWEEN ECM AND WASTEGATE CONTROL SOLENOID VALVE CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the wastegate control solenoid valve.
3. Disconnect the connector from ECM.
4. Measure the resistance between wastegate control solenoid valve connector and engine ground.

Connector & terminal

(E64) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair ground short circuit of harness between ECM and wastegate control solenoid valve connector.

5. CHECK HARNESS BETWEEN ECM AND WASTEGATE CONTROL SOLENOID VALVE CONNECTOR.

Measure the resistance of harness between ECM and wastegate control solenoid valve connector.

Connector & terminal

(E159) No. 11 — (E64) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 6.](#)

No

Repair open circuit in harness between ECM and wastegate control solenoid valve connector.

6. CHECK WASTEGATE CONTROL SOLENOID VALVE.

1. Remove the wastegate control solenoid valve.
2. Measure the resistance between wastegate control solenoid valve terminals.

Terminals


No. 1 — No. 2:

Is the resistance 10 — 100 Ω ?

Yes

Repair poor contact of wastegate control solenoid valve connector.

No

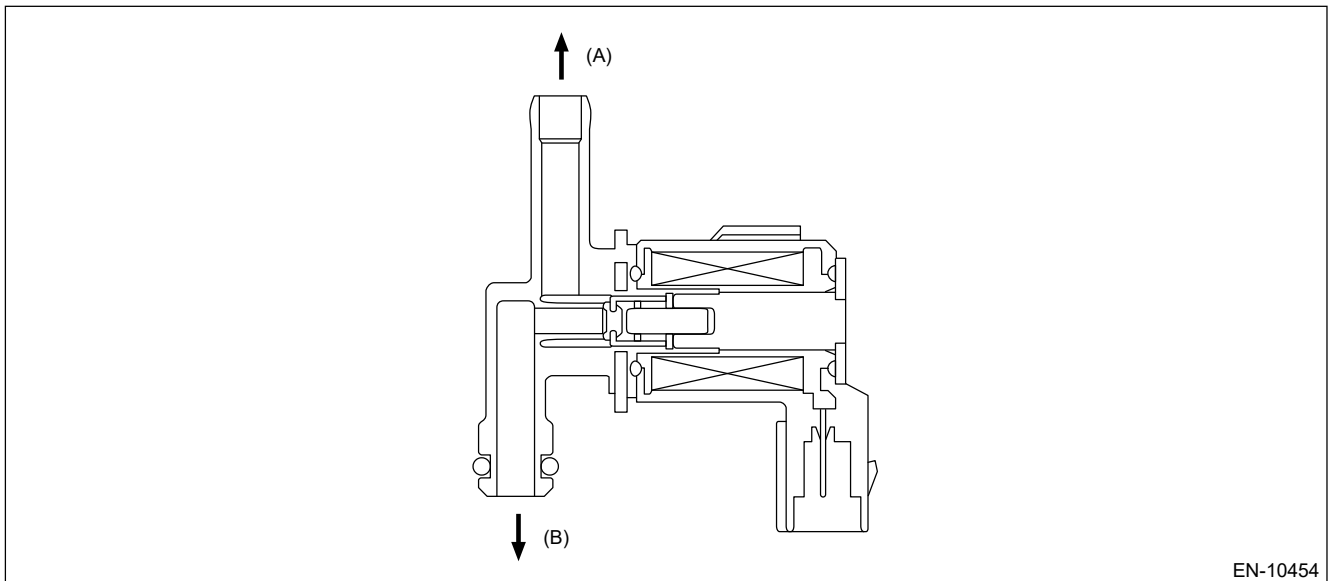
Replace the wastegate control solenoid valve.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Wastegate Control Solenoid Valve.](#)

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of the wastegate control solenoid valve.

Judge as NG when the terminal output voltage remains Low during outputting the duty signal.

2. COMPONENT DESCRIPTION



(A) Turbocharger

(B) Intake duct

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Duty ratio of wastegate control	$\leq 80\%$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis after starting the engine.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$\leq 2.2 \text{ V}$

Time needed for diagnosis: 640 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0246 TURBOCHARGER/SUPERCHARGER WASTEGATE SOLENOID "A" HIGH



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

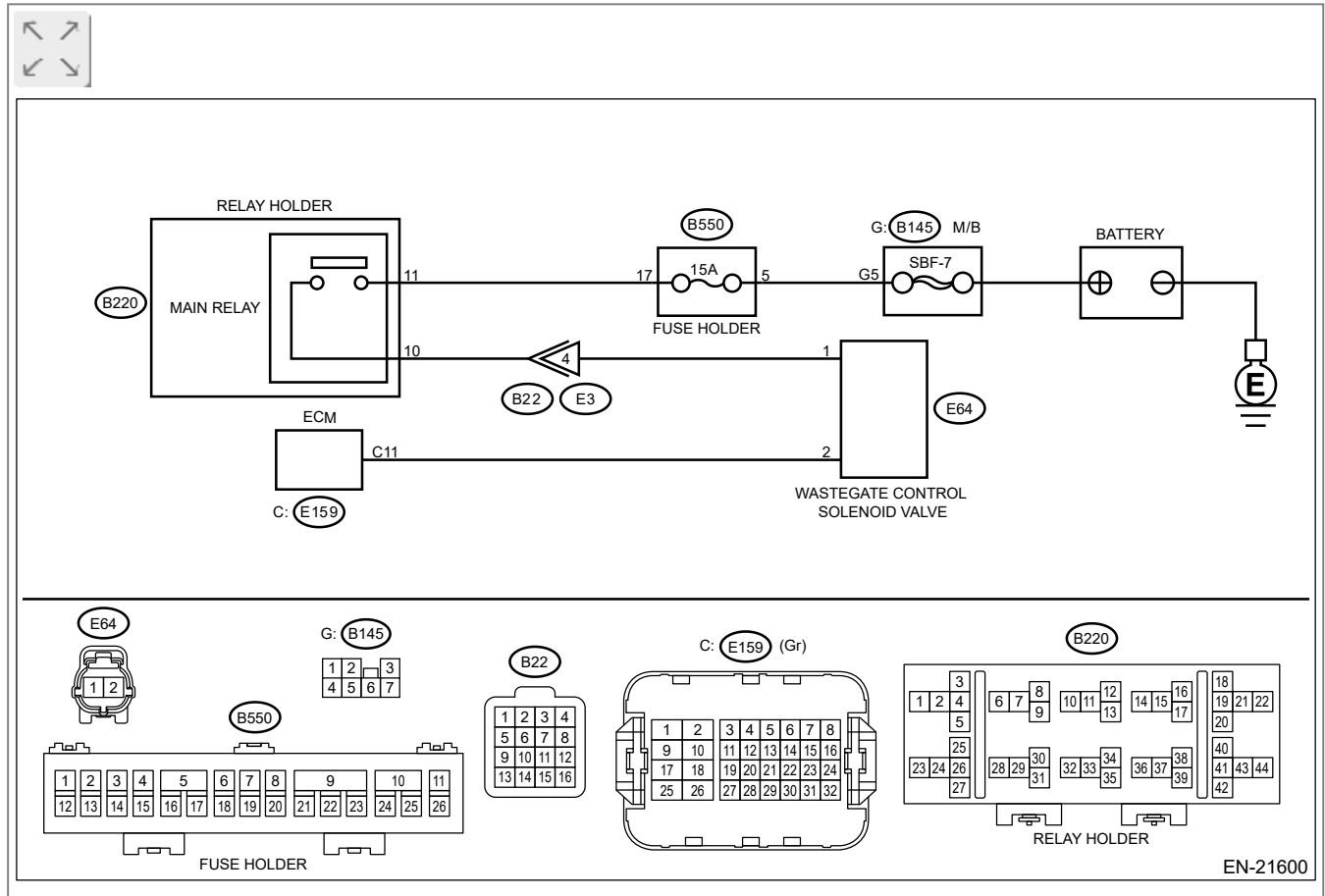
Poor driving performance

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND WASTEGATE CONTROL SOLENOID VALVE CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the wastegate control solenoid valve.
3. Disconnect the connector from ECM.

4. Turn the ignition switch to ON.
5. Measure the voltage between ECM and engine ground.

Connector & terminal


(E159) No. 11 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

Repair short circuit to power in the harness between ECM and wastegate control solenoid valve connector.

No

 [Go to 2.](#)

2. CHECK WASTEGATE CONTROL SOLENOID VALVE.


1. Turn the ignition switch to OFF.
2. Measure the resistance between wastegate control solenoid valve terminals.

Terminals

No. 1 — No. 2:

Is the resistance less than 1 Ω ?

Yes

Replace the wastegate control solenoid valve.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Wastegate Control Solenoid Valve.](#)

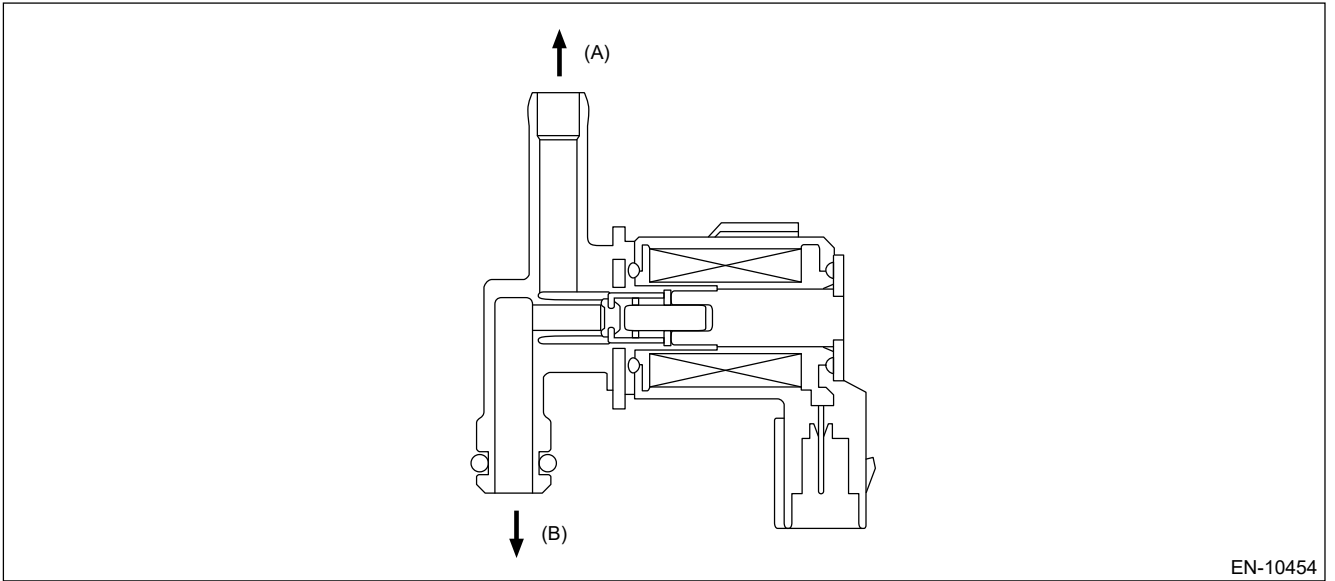
No

Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of the wastegate control solenoid valve.
Judge as NG when overcurrent is detected.

2. COMPONENT DESCRIPTION



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(A) Turbocharger

(B) Intake duct

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Duty ratio of wastegate control	$\geq 20\%$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis after starting the engine.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output current	$\geq 17\text{A}$

Time needed for diagnosis: 2250 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0300 RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED

DTC detecting condition:


Detected when two consecutive driving cycles with fault occur.

Immediately at fault recognition (A misfire which could damage catalyst occurs.)

Trouble symptom:

- Engine stalls.
- Improper idling
- Rough driving

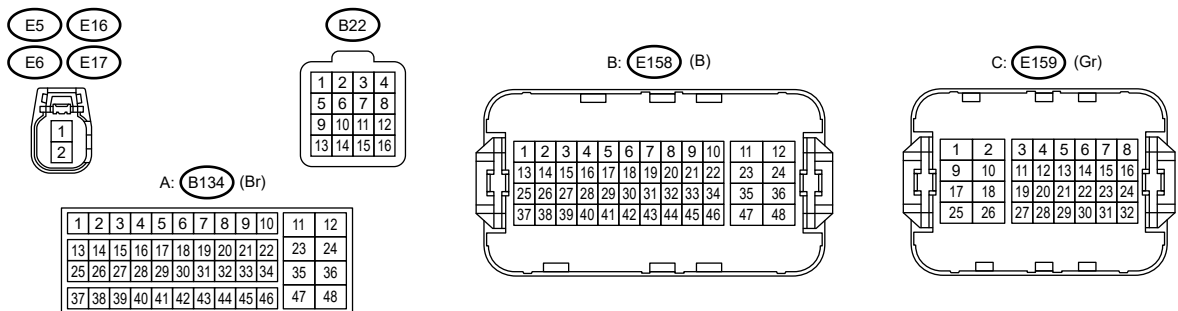
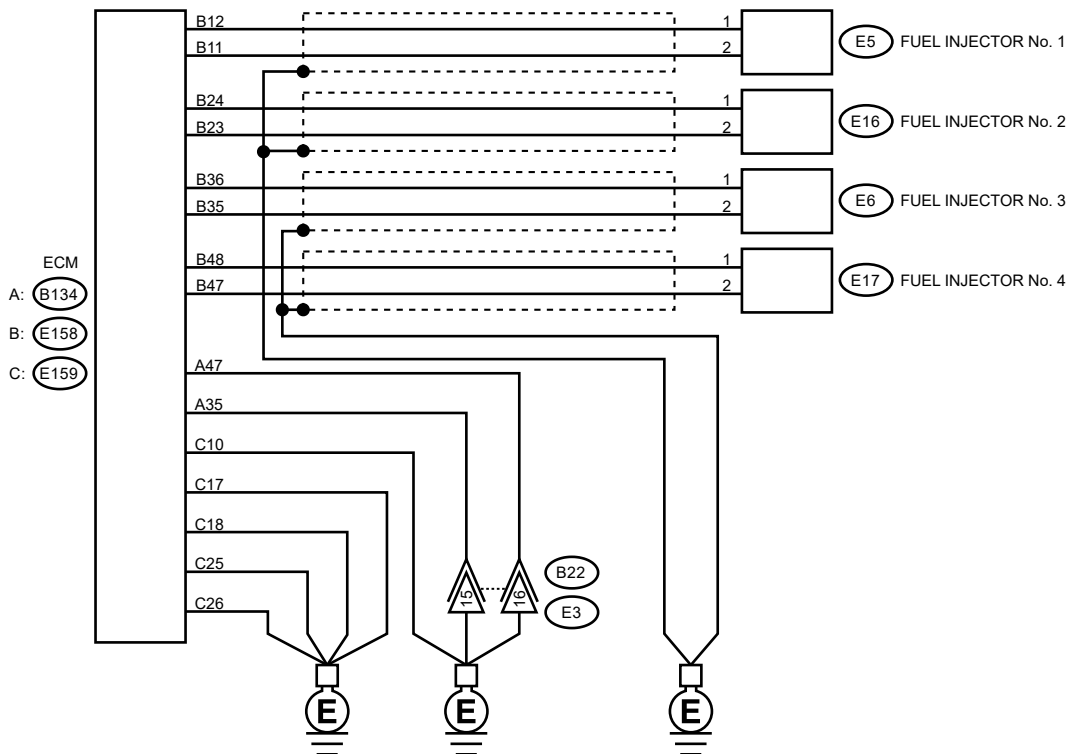
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode. and Inspection Mode !\[\]\(7d0a8d8b1031f74abe67b09fcf4a2322_img.jpg\) \[Ref. to ENGINE \\(DIAGNOSTICS\\)\\(H4DOTC\\)>Inspection Mode.\]\(#\)](#)**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





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1. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from all fuel injectors.
3. Measure the resistance between all fuel injector connectors and engine ground.


Connector & terminal

- #1 (E5) No. 1 — Engine ground:
- #1 (E5) No. 2 — Engine ground:
- #2 (E16) No. 1 — Engine ground:
- #2 (E16) No. 2 — Engine ground:
- #3 (E6) No. 1 — Engine ground:
- #3 (E6) No. 2 — Engine ground:
- #4 (E17) No. 1 — Engine ground:

#4 (E17) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 2.](#)

No

Repair the short circuit to ground in harness between ECM and fuel injector connector.

2. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.



Measure the resistance of harness between ECM and fuel injector connector on all cylinders.

Connector & terminal

- #1 (E158) No. 12 — (E5) No. 1:
- #1 (E158) No. 11 — (E5) No. 2:
- #2 (E158) No. 24 — (E16) No. 1:
- #2 (E158) No. 23 — (E16) No. 2:
- #3 (E158) No. 36 — (E6) No. 1:
- #3 (E158) No. 35 — (E6) No. 2:
- #4 (E158) No. 48 — (E17) No. 1:
- #4 (E158) No. 47 — (E17) No. 2:

Is the resistance less than 1 Ω ?

Yes


 [Go to 3.](#)

No

Repair the open circuit in harness between ECM and fuel injector connector.

3. CHECK FUEL INJECTOR.




Check all fuel injectors.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Injector>INSPECTION.](#)

Are fuel injectors OK?

Yes

 [Go to 4.](#)

No

Replace the faulty fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Injector.](#)

4. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR/CRANKSHAFT POSITION SENSOR.



Is the camshaft position sensor or crankshaft position sensor loosely installed?

Yes

Tighten the camshaft position sensor or crankshaft position sensor. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Camshaft Position Sensor>INSTALLATION.](#) [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor>INSTALLATION.](#)

No

[Go to 5.](#)

5. CHECK CRANKSHAFT POSITION SENSOR PLATE.



Is the crankshaft position sensor plate rusted or does it have broken teeth?

Yes

Replace the crankshaft position sensor plate. [Ref. to MECHANICAL\(H4DOTC\)>Cylinder Block.](#)

No

[Go to 6.](#)

6. CHECK INSTALLATION CONDITION OF TIMING CHAIN.



Turn the crankshaft using ST, and align the alignment mark on crank sprocket with alignment mark on cylinder block.

ST 18252AA000 CRANKSHAFT SOCKET

Is the timing chain dislocated from its proper position?

Yes

Correct the installation condition of timing chain. [Ref. to MECHANICAL\(H4DOTC\)>Timing Chain Assembly.](#)

No

[Go to 7.](#)

7. CHECK FUEL LEVEL.




Is the fuel meter indication higher than the "Lower" level?



[Go to 8.](#)

Yes

No

Refill the fuel so that the fuel meter indication is higher than the "Lower" level, and proceed to the next step.  [Go to 11.](#)

8. CHECK PCV VALVE.



Check the PCV valve.

Is the PCV valve free from deformation, crack or other damage?

Yes

Repair or replace the PCV valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>PCV Valve.](#)

No

 [Go to 9.](#)

9. CHECK PCV HOSE.




Check the PCV hose.

Is the PCV hose free from deformation, crack or other damage?

Yes

Repair or replace the PCV hose.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>PCV Hose Assembly.](#)

No

 [Go to 10.](#)

10. CHECK PCV HOSE.




Check the PCV hose.

Check the clamp of PCV hose assembly for damage or looseness.

Yes


Repair or replace the PCV valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>PCV Valve.](#)

No

 [Go to 11.](#)


11. CHECK STATUS OF MALFUNCTION INDICATOR LIGHT.




1. Clear the memory using the Subaru Select Monitor or general scan tool.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)
2. Start the engine, and drive the vehicle 10 minutes or more.

Does the malfunction indicator light illuminate or blink?

Yes

 [Go to 13.](#)

No

 [Go to 12.](#)

12. CHECK CAUSE OF MISFIRE.

Was the cause of misfire identified when the engine is running?

Yes

Finish diagnostics operation, if the engine has no abnormality.

No

Repair the poor contact of connector.

Note:

In this case, repair the following item:

- **Poor contact of ignition coil connector**
- **Poor contact of fuel injector connector on faulty cylinders**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

13. CHECK AIR INTAKE SYSTEM.

Is there any fault in air intake system?

Yes


Repair the air intake system.

Note:

Check the following items.

- **Are there air leaks or air suction caused by loose or dislocated nuts and bolts?**
- **Are there cracks or any disconnection of hoses?**

No

 [Go to 14.](#)

14. CHECK ALL CYLINDERS.

Is there a fault in any cylinder?

Yes


Repair or replace the faulty part of the faulty cylinder.

Note:

Check the following items.

- **Spark plug**
- **Ignition coil**
- **Fuel injector**
- **Compression**
- **Skipping timing chain teeth**

No

Go to DTC P0171.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0171 SYSTEM TOO LEAN BANK 1.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0301.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0301 CYLINDER 1 MISFIRE DETECTED.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0301 CYLINDER 1 MISFIRE DETECTED

Note:

For the diagnostic procedure, refer to DTC P0304.  Ref. to [ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0304 CYLINDER 4 MISFIRE DETECTED.](#)

1. OUTLINE OF DIAGNOSIS

Detect the presence of misfire occurrence. (Revolution fluctuation method)

Monitoring misfire which influences exhaust deterioration (1.5 times of FTP) and catalyst damage is made obligatory by the law. Misfire affecting these two has two patterns below:

- Intermittent misfire (the same cylinder misfires in random, or different cylinders misfire in random): FTP 1.5 times misfire
- Every time misfire (the same cylinder misfires every time): FTP 1.5 times misfire, catalyst damage misfire

The following detecting methods are adopted for these detection.

1. Intermittent misfire: FTP 1.5 times misfire
 - 180° Interval Difference Method
 - 360° Interval Difference Method
 - 720° Interval Difference Method
2. Misfire every time: FTP 1.5 times misfire, catalyst damage misfire
 - 180° Interval Difference Method
 - 360° Interval Difference Method

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 8 V
Fuel shut-off function	≠ Fuel cut
Engine speed	400 rpm — 6000 rpm
Intake manifold pressure	<ul style="list-style-type: none">• Normal ignition 19.1 kPa — 47 kPa (Changes based on the engine speed and atmospheric pressure.)• Idling ignition 19.3 kPa — 46.2 kPa (Changes based on the engine speed and

	atmospheric pressure.)
Time elapsed after engine start	≥ 2 crankshaft revolutions
Following condition A or B is met	
A: Engine coolant temperature at engine starting	> -7° (19°F)
B: Following conditions (b1) and (b2) are met	≤ -7° (19°F)
(b1) Engine coolant temperature at engine starting	
(b2) Engine coolant temperature	≥ 21° (70°F)

3. GENERAL DRIVING CYCLE

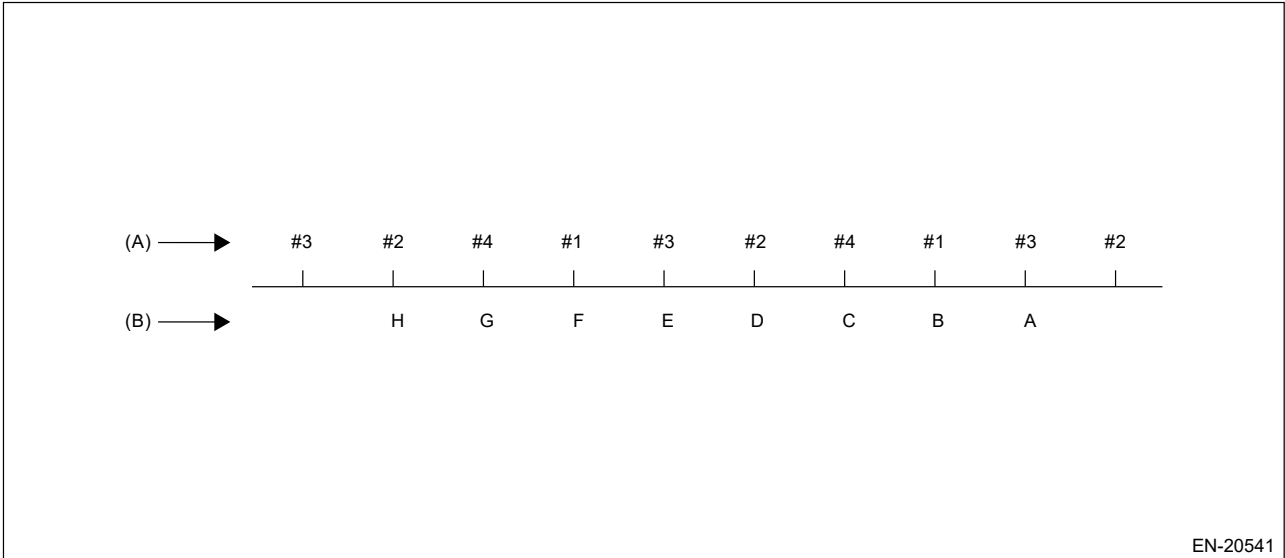
- If conditions are met, it is possible to detect the misfires from idling to high engine speed. However, in case any engine load or breakage occurs, perform with the engine at idle.
- Perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

When a misfire occurs, the engine speed will decrease and the crankshaft position speed will change. Calculate the interval difference value (diagnostic value) from crankshaft position speed by the following formula, and judge whether a misfire is occurring or not comparing the calculated result with judgment value. Count the number of misfires, if the misfire ratio is higher during 1000 revs. or 200 revs., judge corresponding cylinders as NG.

Diagnostic value calculation (Calculate from angle speed) →	Misfire detection every single ignition (Compare diagnostic value with judgment value) →	NG judgment (Misfire occurrence judgment required by the law) (Compare number of misfire with judgment value)
	<ul style="list-style-type: none"> • 180 Degree Interval Difference Method • 360 Degree Interval Difference Method • 720 Degree Interval Difference Method 	<ul style="list-style-type: none"> • FTP 1.5 times misfire NG judgment • NG judgment for catalyst-damaging misfire

As shown in the following figure, pick a cylinder as the standard and name it A. And the former crankshaft position speed is named B, the second former crankshaft position speed is named C, the third is named D, etc.

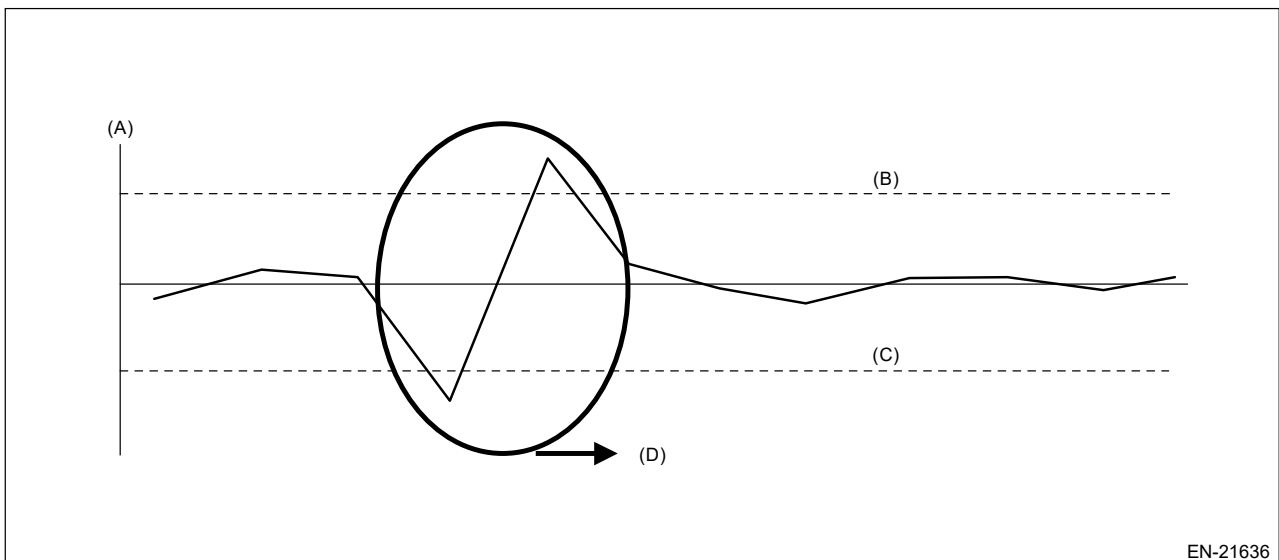


(A) Ignition order

(B) Crankshaft position speed

180° INTERVAL DIFFERENCE METHOD

Diagnostic value	180 degree interval difference = (A - B) - (B - C)
Judge as a misfire in the following cases.	
<ul style="list-style-type: none"> • 180 degree interval difference ≥ Judgment value of positive side • 180 degree interval difference ≤ Judgment value of negative side (Diagnostic value before 180° CA) 	



(A) 180 degree interval difference

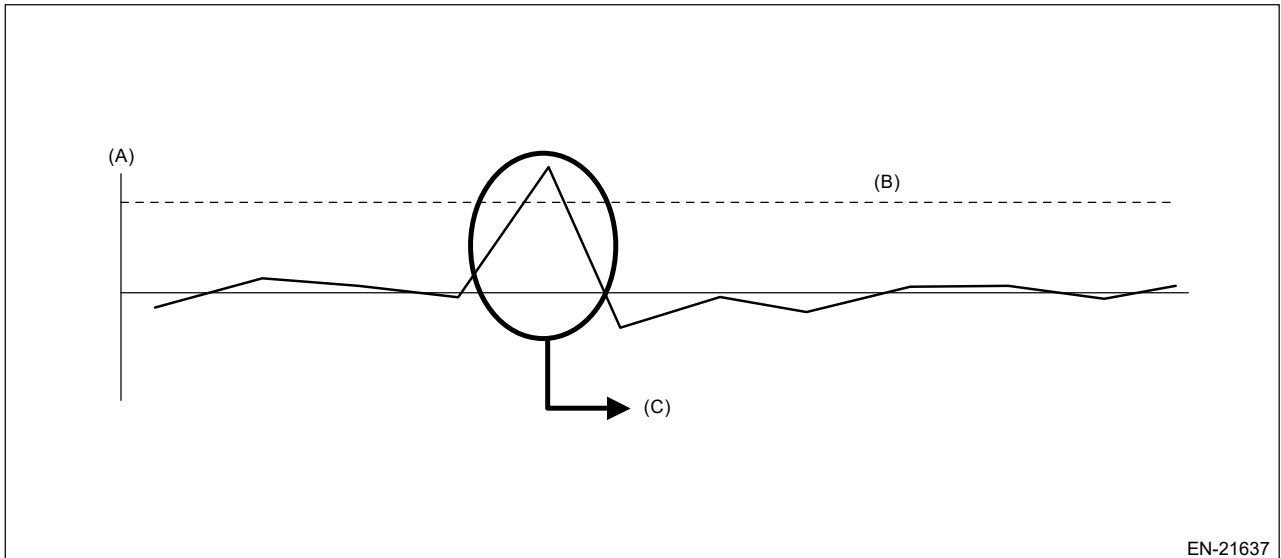
(C) Threshold valve (negative number)

(B) Threshold valve (positive number)

(D) Judged as misfire.

360° INTERVAL DIFFERENCE METHOD

Diagnostic value	360 degree interval difference = (B - A) - (D - C)
Misfire judgment	360 degree interval difference > Judgment value: → Judged as misfire

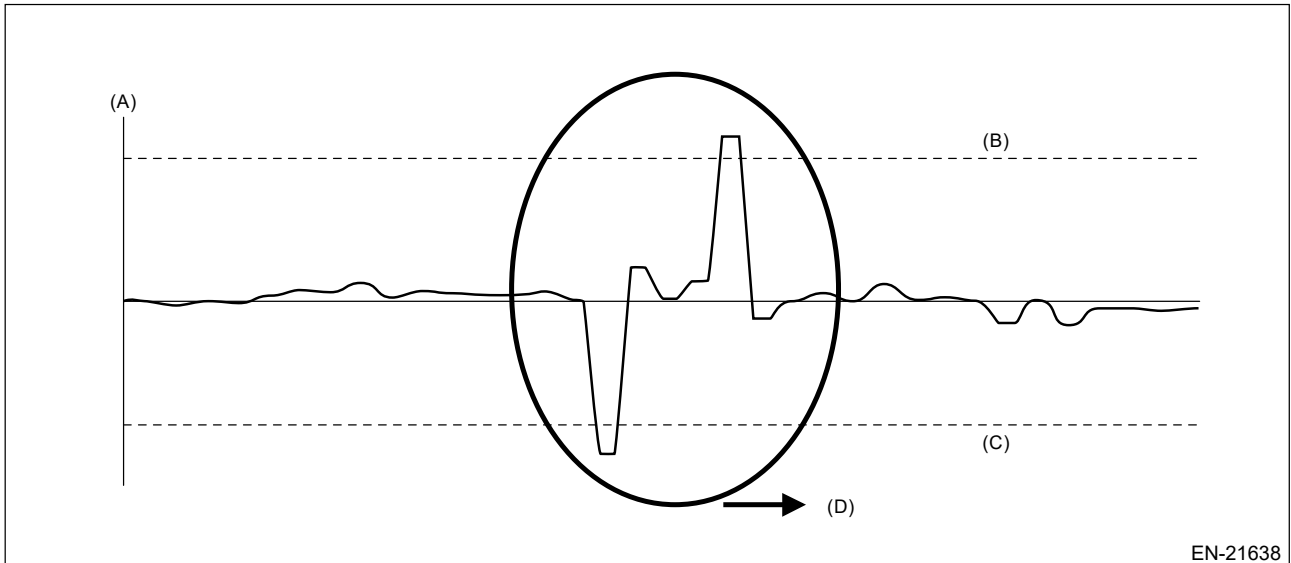


(A) 360 degree interval difference (C) Judged as misfire.

(B) Threshold value

720° INTERVAL DIFFERENCE METHOD

Diagnostic value	720 degree interval difference = (A - B) - (E - F)
Misfire judgment	<p>Judge as a misfire in the following cases.</p> <ul style="list-style-type: none"> • 720 degree interval difference \geq Judgment value of positive side • 720 degree interval difference \leq Judgment value of negative side <p>(Diagnostic value before 720° CA)</p>



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- (A) 720 degree interval difference (C) Threshold value (negative number)
 (B) Threshold value (positive number) (D) Judged as misfire.

● **FTP 1.5 TIMES MISFIRE (MISFIRE OCCURRENCE LEVEL WHICH INFLUENCES EXHAUST GAS)**

Judgment value (Judge that malfunction occurs when the misfire ratio is high in 1000 engine revs.)

Malfunction Criteria	Threshold Value
FTP emission diagnostic value	$\geq 22 \times$ 100/2000% in 1000 revs.

Time needed for diagnosis: 1000 engine revs.

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

● **CATALYST-DAMAGING MISFIRE (MISFIRE OCCURRENCE LEVEL THAT WILL DAMAGE CATALYST)**

Judgment value

Malfunction Criteria	Threshold Value
Catalyst-damaging misfire diagnostic value	\geq Value from Map

Map

Percentage (%)		Charging efficiency (%)											
		15	30	45	60	75	90	105	120	135	150	165	180
Engine speed (rpm)	700	25	25	—	—	—	—	—	—	—	—	—	—
	1000	25	25	25	25	25	25	—	—	—	—	—	—
	1500	25	25	25	25	16.75	16.75	16.75	—	—	—	—	—
	2000	25	25	25	25	16.75	14.25	12.5	—	—	—	—	—

2500	25	25	19.75	17	14.25	12.5	11	11	—	—	—	—
3000	25	25	19.75	17	14.25	12	10.5	10	7.75	6	—	—
3500	25	25	19.75	17	14.25	11	9	7.75	6	5	5	5
4000	—	25	19.75	17	14.25	11	8.25	6.25	5	5	5	5
4500	—	25	17.5	14.25	12.5	9	6.75	5	5	5	5	5
5000	—	25	16.75	12.5	11	8.25	6	5	5	5	5	5
5500	—	25	16	12	11	7.25	5	5	5	5	5	5
6000	—	25	15	11	11	6	5	5	5	5	5	5

Time needed for diagnosis: 200 engine revs.

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0302 CYLINDER 2 MISFIRE DETECTED

Note:

For the diagnostic procedure, refer to DTC P0304.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0304 CYLINDER 4 MISFIRE DETECTED.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0301.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0301 CYLINDER 1 MISFIRE DETECTED.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0303 CYLINDER 3 MISFIRE DETECTED

Note:

For the diagnostic procedure, refer to DTC P0304.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0304 CYLINDER 4 MISFIRE DETECTED.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0301.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0301 CYLINDER 1 MISFIRE DETECTED.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0304 CYLINDER 4 MISFIRE DETECTED

DTC detecting condition:


Detected when two consecutive driving cycles with fault occur.

Immediately at fault recognition (A misfire which could damage catalyst occurs.)

Trouble symptom:

- Engine stalls.
- Improper idling
- Rough driving

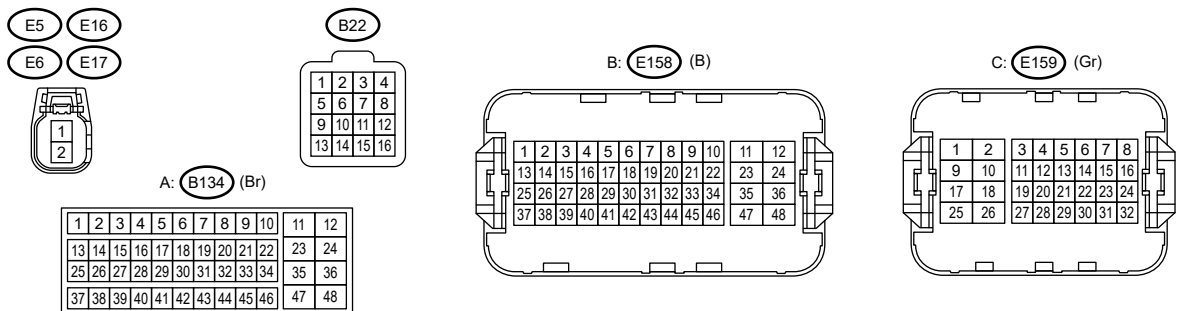
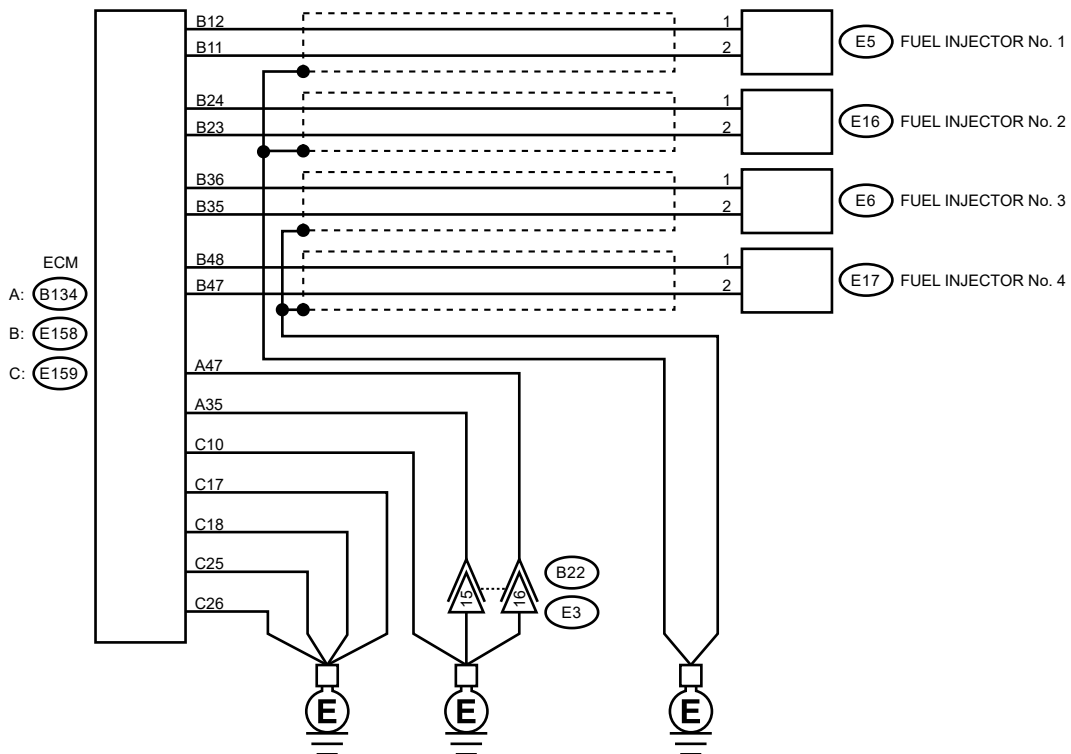
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode. and Inspection Mode !\[\]\(b2166b76608b8499cffc130bf1b1fe60_img.jpg\) \[Ref. to ENGINE \\(DIAGNOSTICS\\)\\(H4DOTC\\)>Inspection Mode.\]\(#\)](#)**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





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1. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector on faulty cylinders.
3. Measure the resistance between fuel injector connector and engine ground on faulty cylinders.

Connector & terminal


- #1 (E5) No. 1 — Engine ground:
- #1 (E5) No. 2 — Engine ground:
- #2 (E16) No. 1 — Engine ground:
- #2 (E16) No. 2 — Engine ground:
- #3 (E6) No. 1 — Engine ground:
- #3 (E6) No. 2 — Engine ground:

#4 (E17) No. 1 — Engine ground:

#4 (E17) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 2.](#)

No

Repair the short circuit to ground in harness between ECM and fuel injector connector.

2. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

Measure the resistance of harness between ECM and fuel injector connector on faulty cylinders.

Connector & terminal

#1 (E158) No. 12 — (E5) No. 1:

#1 (E158) No. 11 — (E5) No. 2:

#2 (E158) No. 24 — (E16) No. 1:

#2 (E158) No. 23 — (E16) No. 2:

#3 (E158) No. 36 — (E6) No. 1:


#3 (E158) No. 35 — (E6) No. 2:

#4 (E158) No. 48 — (E17) No. 1:

#4 (E158) No. 47 — (E17) No. 2:

Is the resistance less than 1 Ω ?


Yes

 [Go to 3.](#)

No


Repair the open circuit in harness between ECM and fuel injector connector.

3. CHECK FUEL INJECTOR.


Check the fuel injector on faulty cylinder.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Injector>INSPECTION.](#)

Are fuel injectors OK?

Yes

 [Go to 4.](#)

No

Replace the faulty fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Injector.](#)

4. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR/CRANKSHAFT POSITION SENSOR.



Is the camshaft position sensor or crankshaft position sensor loosely installed?

Yes

Tighten the camshaft position sensor or crankshaft position sensor. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Camshaft Position Sensor>INSTALLATION.](#) [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor>INSTALLATION.](#)

No

[Go to 5.](#)

5. CHECK CRANKSHAFT POSITION SENSOR PLATE.



Is the crankshaft position sensor plate rusted or does it have broken teeth?

Yes

Replace the crankshaft position sensor plate. [Ref. to MECHANICAL\(H4DOTC\)>Cylinder Block.](#)

No

[Go to 6.](#)

6. CHECK INSTALLATION CONDITION OF TIMING CHAIN.



Turn the crankshaft using ST, and align the alignment mark on crank sprocket with alignment mark on cylinder block.

ST 18252AA000 CRANKSHAFT SOCKET

Is the timing chain dislocated from its proper position?

Yes

Correct the installation condition of timing chain. [Ref. to MECHANICAL\(H4DOTC\)>Timing Chain Assembly.](#)

No


[Go to 7.](#)

7. CHECK FUEL LEVEL.




Is the fuel meter indication higher than the "Lower" level?

Yes

 [Go to 8.](#)

No

Refill the fuel so that the fuel meter indication is higher than the "Lower" level, and proceed to the next step.  [Go to 11.](#)

8. CHECK PCV VALVE.




Check the PCV valve.

Is the PCV valve free from deformation, crack or other damage?

Yes

Repair or replace the PCV valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>PCV Valve.](#)

No

 [Go to 9.](#)


9. CHECK PCV HOSE.




Check the PCV hose.

Is the PCV hose free from deformation, crack or other damage?

Yes

Check the PCV hose assembly for cracks, damage or looseness.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>PCV Hose Assembly.](#)

No

 [Go to 10.](#)

10. CHECK PCV HOSE.




Check the PCV hose.

Check the clamp of PCV hose assembly for damage or looseness.


Yes

Repair or replace the PCV valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>PCV Valve.](#)

No


 [Go to 11.](#)

11. CHECK STATUS OF MALFUNCTION INDICATOR LIGHT.


1. Clear the memory using the Subaru Select Monitor or general scan tool.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)
2. Start the engine, and drive the vehicle 10 minutes or more.

Does the malfunction indicator light illuminate or blink?

Yes

 [Go to 13.](#)

No

 [Go to 12.](#)

12. CHECK CAUSE OF MISFIRE.

Was the cause of misfire identified when the engine is running?

Yes

Finish diagnostics operation, if the engine has no abnormality.

No

Repair the poor contact of connector.

Note:

In this case, repair the following item:

- **Poor contact of ignition coil connector**
- **Poor contact of fuel injector connector on faulty cylinders**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

13. CHECK AIR INTAKE SYSTEM.

Is there any fault in air intake system?

Yes


Repair the air intake system.

Note:

Check the following items.

- **Are there air leaks or air suction caused by loose or dislocated nuts and bolts?**
- **Are there cracks or any disconnection of hoses?**

No

 [Go to 14.](#)

14. CHECK CYLINDER.



Is there any fault in the cylinder?

Yes


Repair or replace faulty parts.

Note:

Check the following items.

- **Spark plug**
- **Ignition coil**
- **Fuel injector**
- **Compression**
- **Skipping timing chain teeth**

No

Go to DTC P0171.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0171 SYSTEM TOO LEAN BANK 1.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0301.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0301 CYLINDER 1 MISFIRE DETECTED.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0327 KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT LOW BANK 1 OR SINGLE SENSOR



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

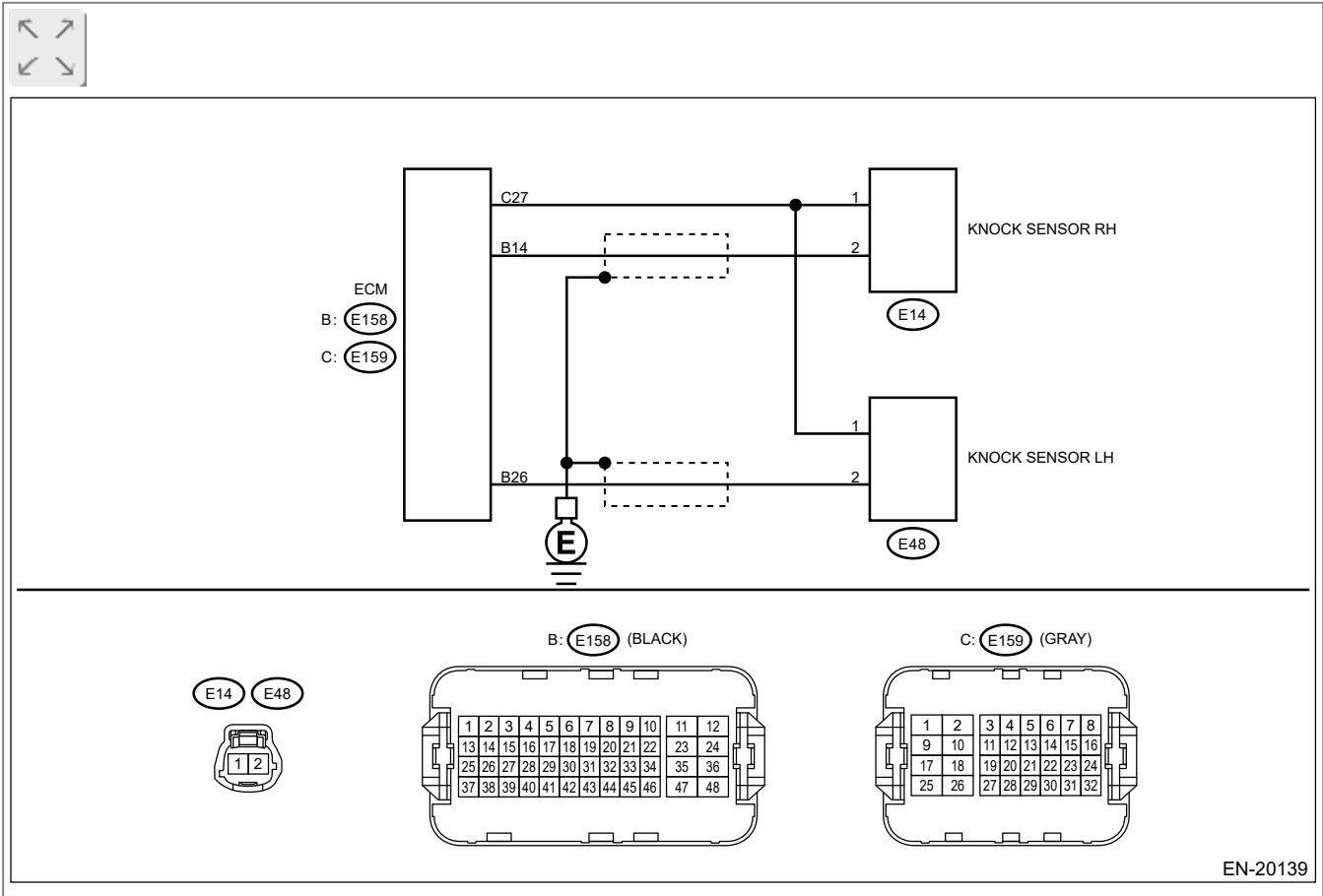
- Poor driving performance
- Knocking occurs

Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND KNOCK SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.




2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.

Connector & terminal

(E158) No. 14 — (E159) No. 27:

Is the resistance less than 500 k Ω ?

Yes

 [Go to 2.](#)

No

 [Go to 3.](#)

2. CHECK KNOCK SENSOR.




1. Disconnect the connector from the knock sensor.
2. Measure the resistance between knock sensor connectors.

Terminals

No. 1 — No. 2:

Is the resistance less than 500 k Ω ?

Yes

Replace the knock sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Knock Sensor.](#)

No

Repair the short circuit to ground in harness between ECM and knock sensor connector.

Note:

The harness between both connectors are shielded. Remove the shield and repair the short circuit of harness.

3. CHECK INPUT SIGNAL OF ECM.



1. Connect the ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM and engine ground.

Connector & terminal

(E158) No. 14 (+) — Engine ground (-):

Is the voltage 2 V or more?

Yes

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

Repair the short circuit to ground in harness between ECM and knock sensor connector.

Note:

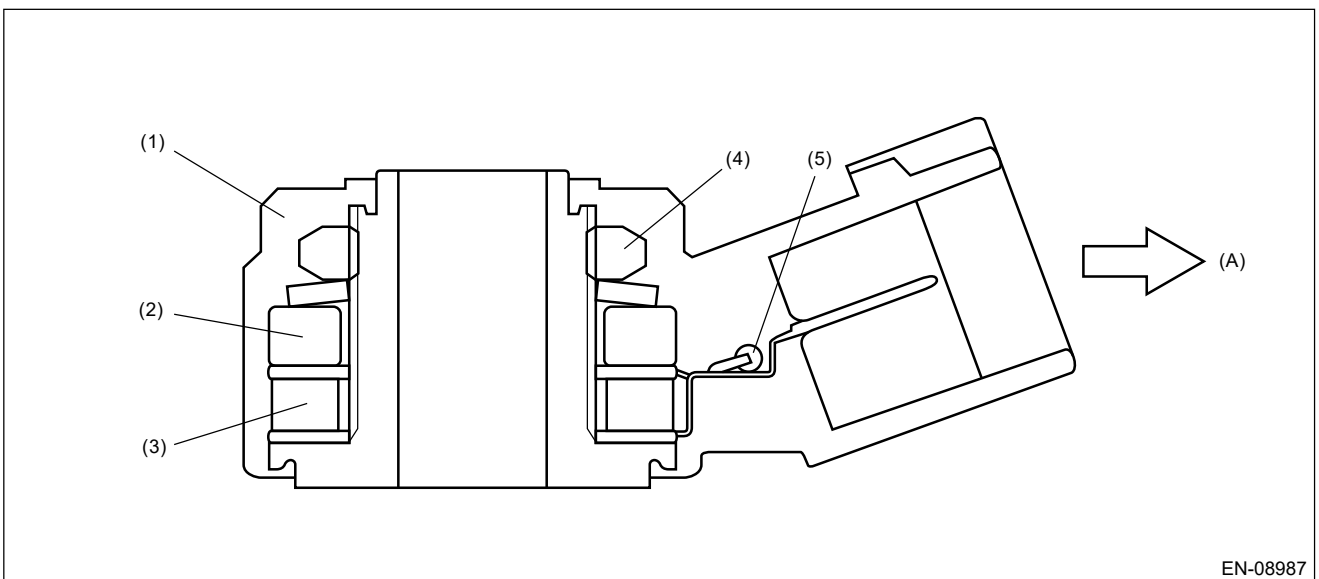
The harness between both connectors are shielded. Remove the shield and repair the short circuit of harness.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of knock sensor.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-08987

(A) To knock sensor harness

(1) Case

(3) Piezoelectric element

(5) Resistance

(2) Weight

(4) Nut

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
----------------------	-----------------

Output voltage	< 0.22 V
----------------	----------

Time needed for diagnosis: 1000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0328 KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT HIGH BANK 1 OR SINGLE SENSOR



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

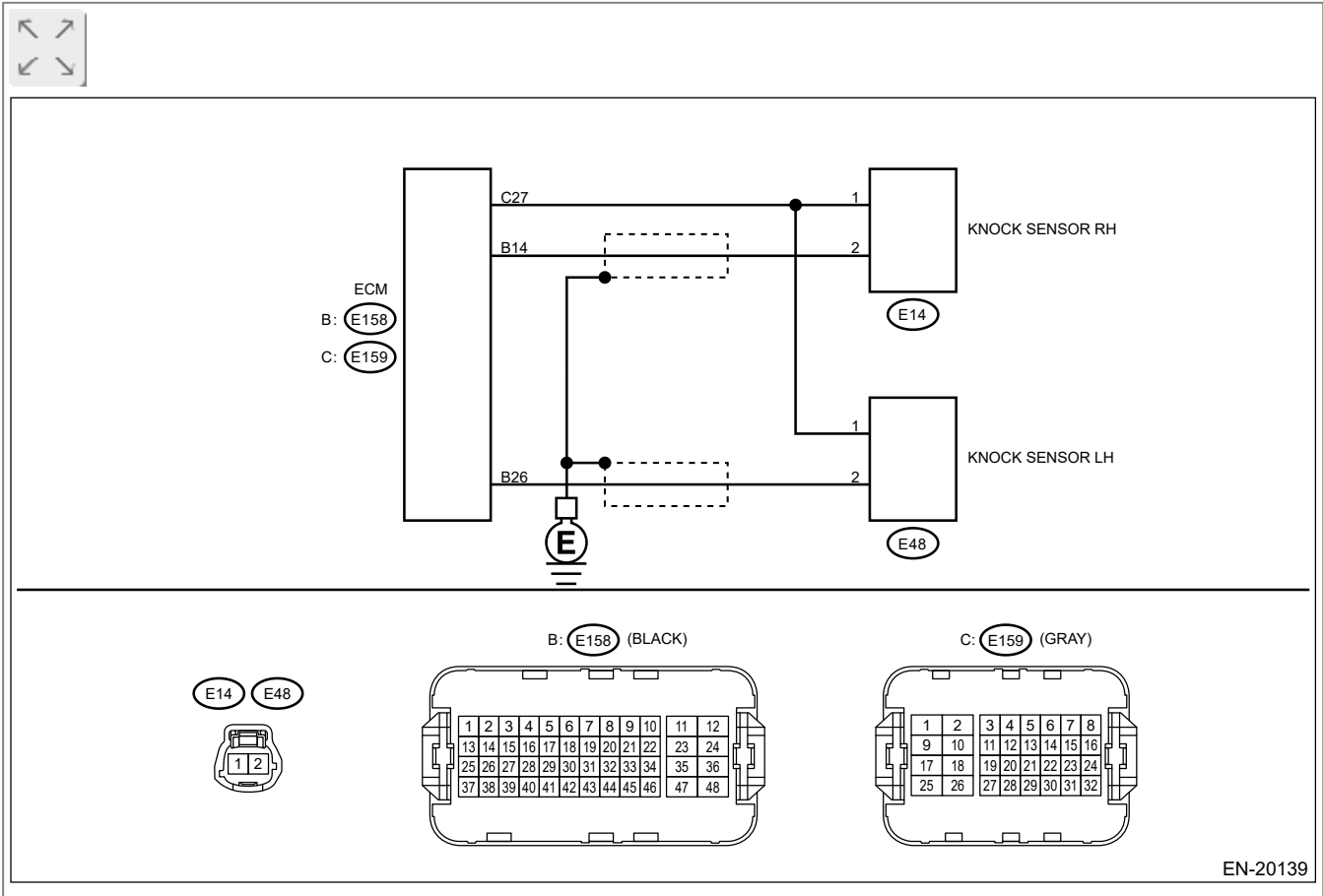
- Poor driving performance
- Knocking occurs

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND KNOCK SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.


2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.

Connector & terminal

(E158) No. 14 — (E159) No. 27:

Is the resistance 600 kΩ or more?

Yes

 [Go to 2.](#)

No

Repair the poor contact of ECM connector.

2. CHECK KNOCK SENSOR.




1. Disconnect the connector from the knock sensor.
2. Measure the resistance between knock sensor terminals.

Terminals

No. 1 — No. 2:

Is the resistance 600 kΩ or more?

Yes

Replace the knock sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Knock Sensor.](#)

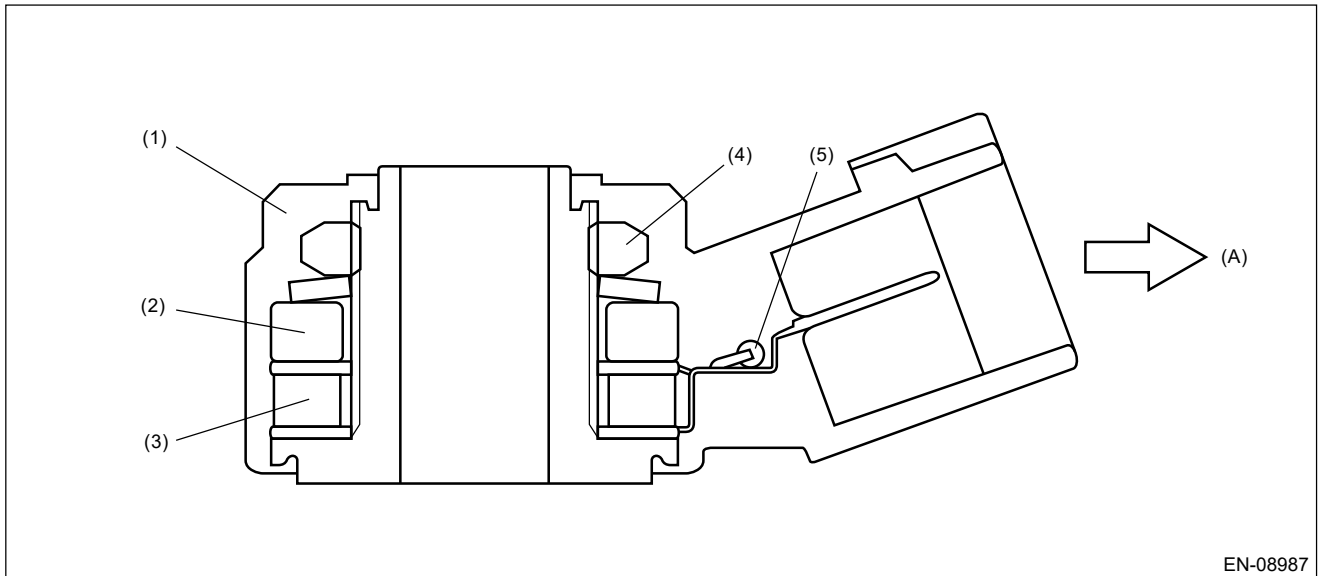
No

Repair the open circuit in harness between ECM and knock sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of knock sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-08987

(A) To knock sensor harness

(1) Case

(3) Piezoelectric element

(5) Resistance

(2) Weight

(4) Nut

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	> 4.73 V

Time needed for diagnosis: 1000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0332 KNOCK/COMBUSTION VIBRATION SENSOR 2 CIRCUIT LOW BANK 2



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

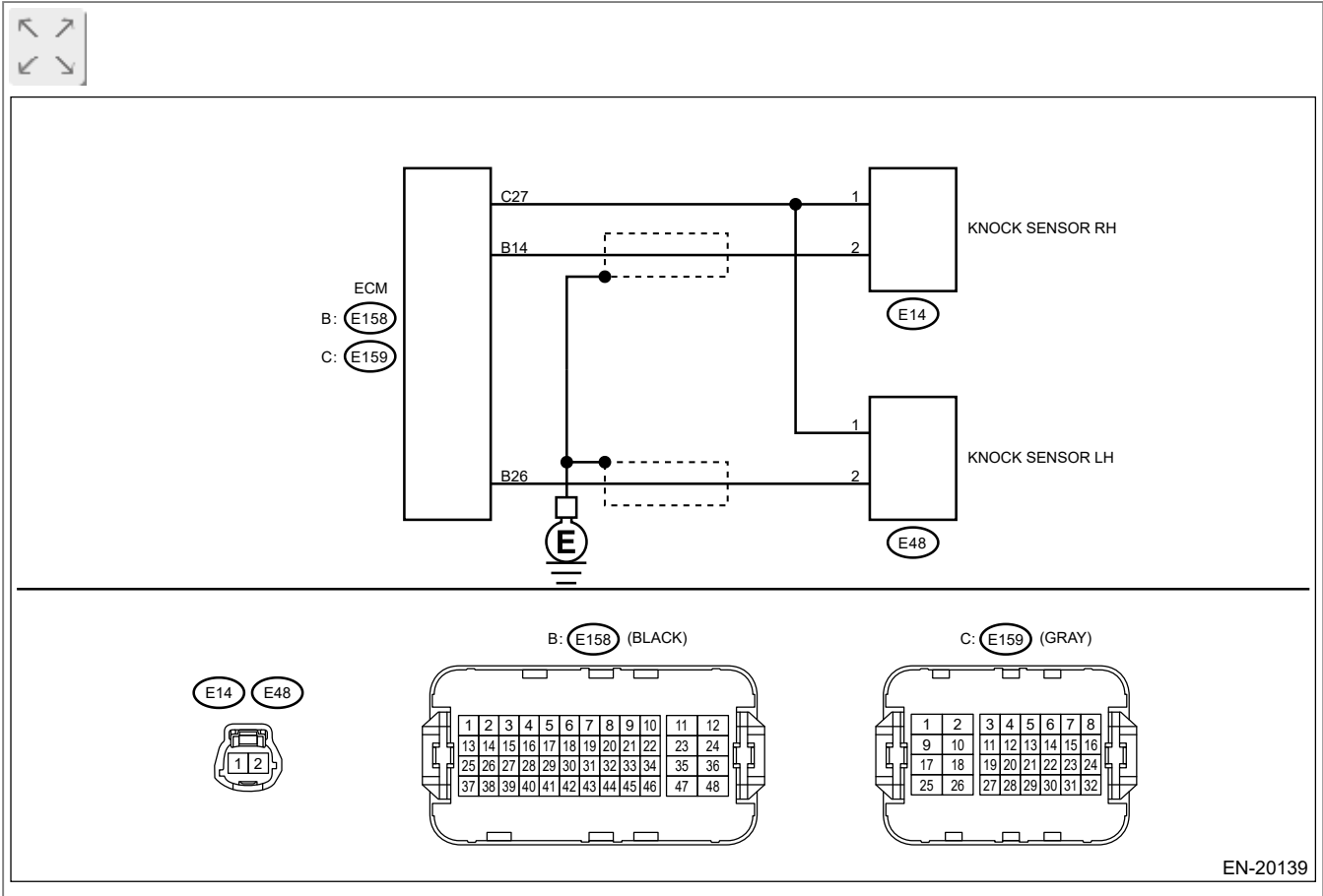
- Driving performance problem
- Knocking occurs

Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND KNOCK SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.


3. Measure the resistance between ECM connectors.

Connector & terminal


(E158) No. 26 — (E159) No. 27:

Is the resistance less than 500 k Ω ?

Yes

 [Go to 2.](#)

No

 [Go to 3.](#)

2. CHECK KNOCK SENSOR.




1. Disconnect the connector from the knock sensor.
2. Measure the resistance between knock sensor connectors.

Terminals

No. 1 — No. 2:

Is the resistance less than 500 k Ω ?

Yes

Replace the knock sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Knock Sensor.](#)

No

Repair the short circuit to ground in harness between ECM and knock sensor connector.

Note:

The harness between both connectors are shielded. Remove the shield and repair the short circuit of harness.

3. CHECK INPUT SIGNAL OF ECM.



1. Connect the ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM and engine ground.

Connector & terminal

(E158) No. 26 (+) — Engine ground (-):

Is the voltage 2 V or more?

Yes

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

Repair the short circuit to ground in harness between ECM and knock sensor connector.

Note:

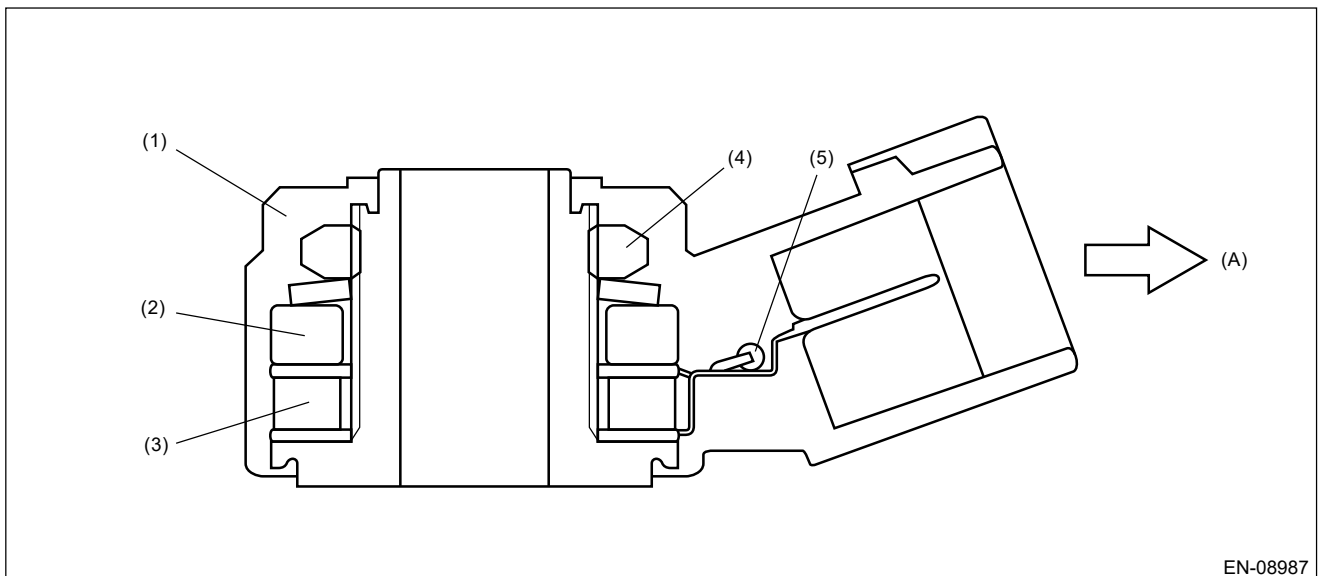
The harness between both connectors are shielded. Remove the shield and repair the short circuit of harness.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of knock sensor.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(A) To knock sensor harness

(1) Case

(3) Piezoelectric element

(5) Resistance

(2) Weight

(4) Nut

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value

Output voltage	< 0.22 V
----------------	----------

Time needed for diagnosis: 1000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0333 KNOCK/COMBUSTION VIBRATION SENSOR 2 CIRCUIT HIGH BANK 2



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

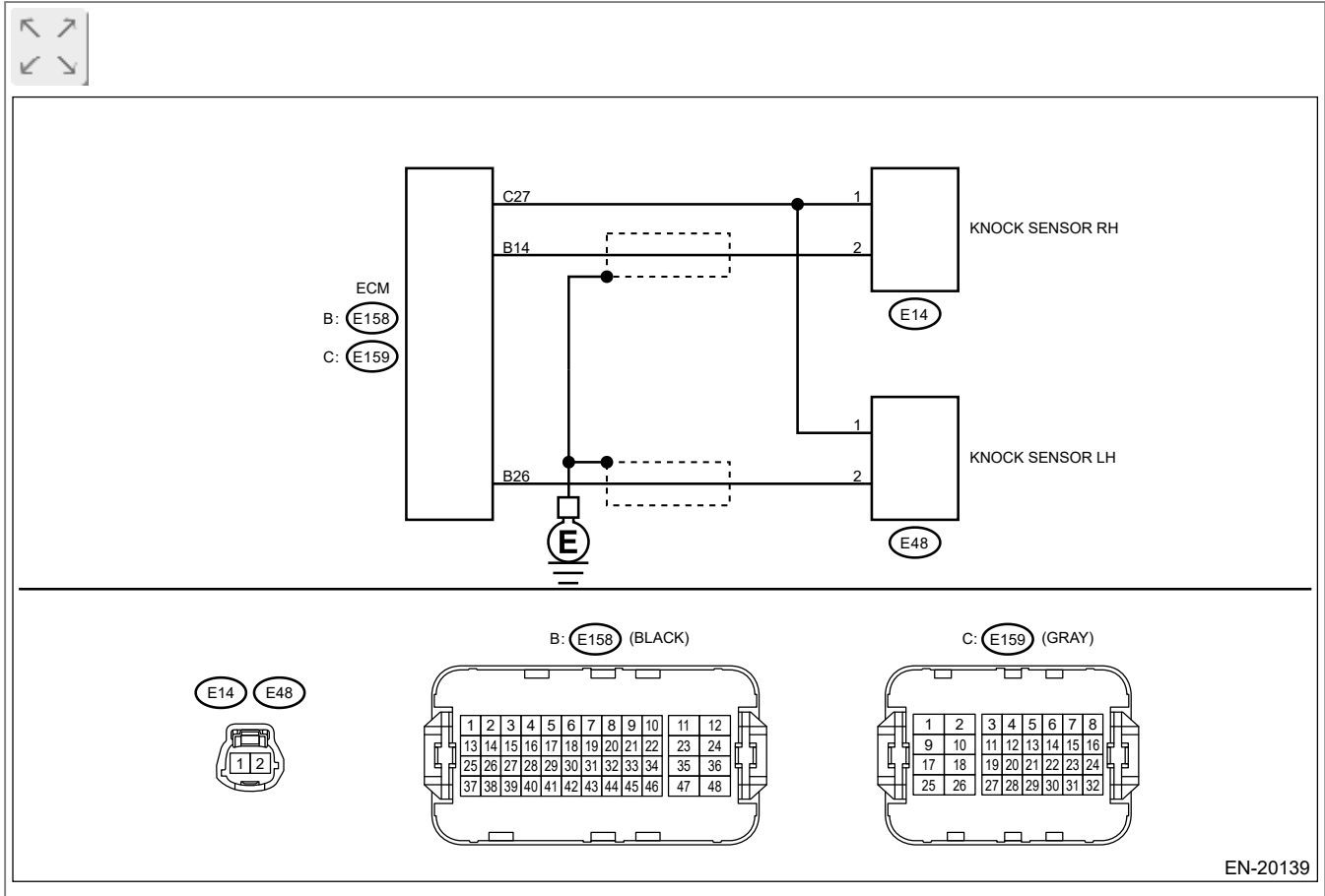
- Driving performance problem
- Knocking occurs

Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND KNOCK SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.


3. Measure the resistance between ECM connectors.

Connector & terminal

(E158) No. 26 — (E159) No. 27:

Is the resistance 600 k Ω or more?

Yes

 [Go to 2.](#)

No

Repair the poor contact of ECM connector.

2. CHECK KNOCK SENSOR.



1. Disconnect the connector from the knock sensor.


2. Measure the resistance between knock sensor terminals.

Terminals

No. 1 — No. 2:

Is the resistance 600 k Ω or more?

Yes

Replace the knock sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Knock Sensor.](#)

No

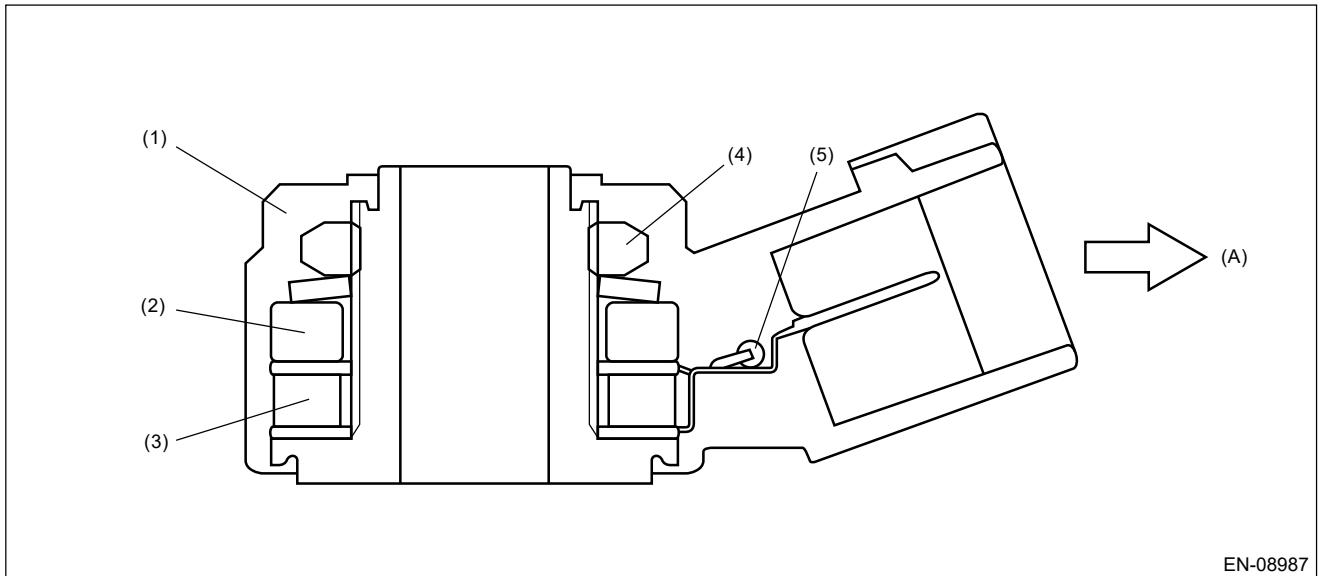
Repair the open circuit in harness between ECM and knock sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of knock sensor.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(A) To knock sensor harness

(1) Case

(3) Piezoelectric element

(5) Resistance

(2) Weight

(4) Nut

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	> 4.73 V

Time needed for diagnosis: 1000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

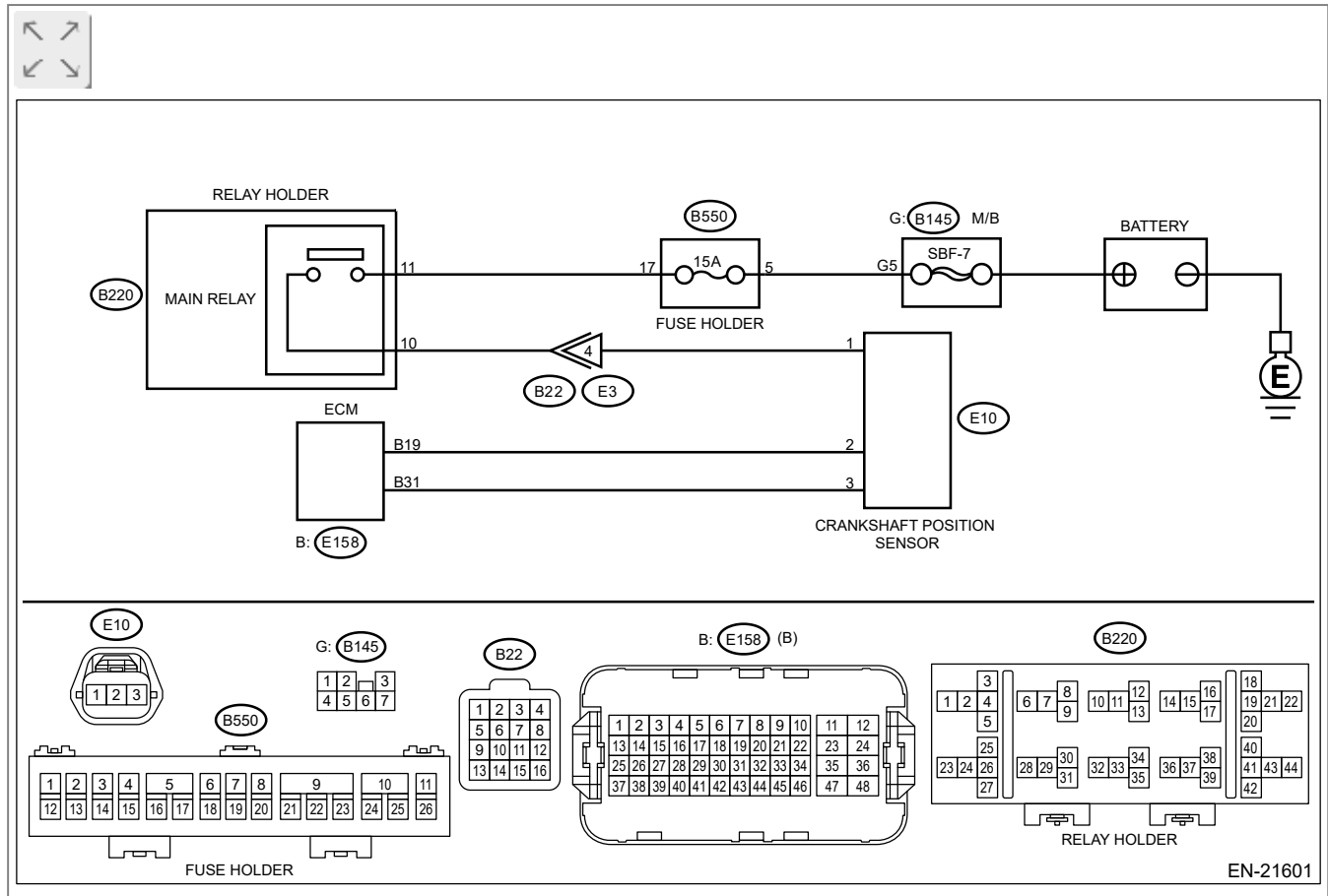
- Engine stalls.
- Failure of engine to start

Caution:

- **After servicing or replacing faulty parts, perform Clear Memory**  **Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode**  **Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK POWER SUPPLY OF CRANKSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the crankshaft position sensor.
3. Turn the ignition switch to ON.


4. Measure the voltage between crankshaft position sensor connector and engine ground.

Connector & terminal

(E10) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit or short circuit to ground in harness between main relay connector and crankshaft position sensor connector**
- **Poor contact of coupling connector**

2. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.

- 1.** Turn the ignition switch to OFF.
- 2.** Disconnect the connector from ECM.
- 3.** Measure the resistance between the ECM and crankshaft position sensor connector.

Connector & terminal

(E158) No. 19 — (E10) No. 2:

(E158) No. 31 — (E10) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit in harness between ECM and crankshaft position sensor connector.

3. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.

Measure the resistance between crankshaft position sensor connector and engine ground.


Connector & terminal

(E10) No. 2 — Engine ground:

(E10) No. 3 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair short circuit to ground in harness between ECM and crankshaft position sensor connector.

4. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.

Measure the voltage between crankshaft position sensor connector and engine ground.

Connector & terminal

(E10) No. 2 (+) — Engine ground (-):

(E10) No. 3 (+) — Engine ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in the harness between ECM and crankshaft position sensor connector.

No

 [Go to 5.](#)


5. CHECK CONDITION OF CRANKSHAFT POSITION SENSOR.

Is the crankshaft position sensor installation bolt tightened securely?


Yes

 [Go to 6.](#)

No

Tighten the crankshaft position sensor installation bolt securely.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor>INSTALLATION.](#)

6. CHECK CRANKSHAFT POSITION SENSOR.

Check waveform of crankshaft position sensor.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Engine Control Module \(ECM\) I/O Signal.](#)

Is there any abnormality in waveform?

Yes

Replace the crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor.](#)

No

Repair the following item.

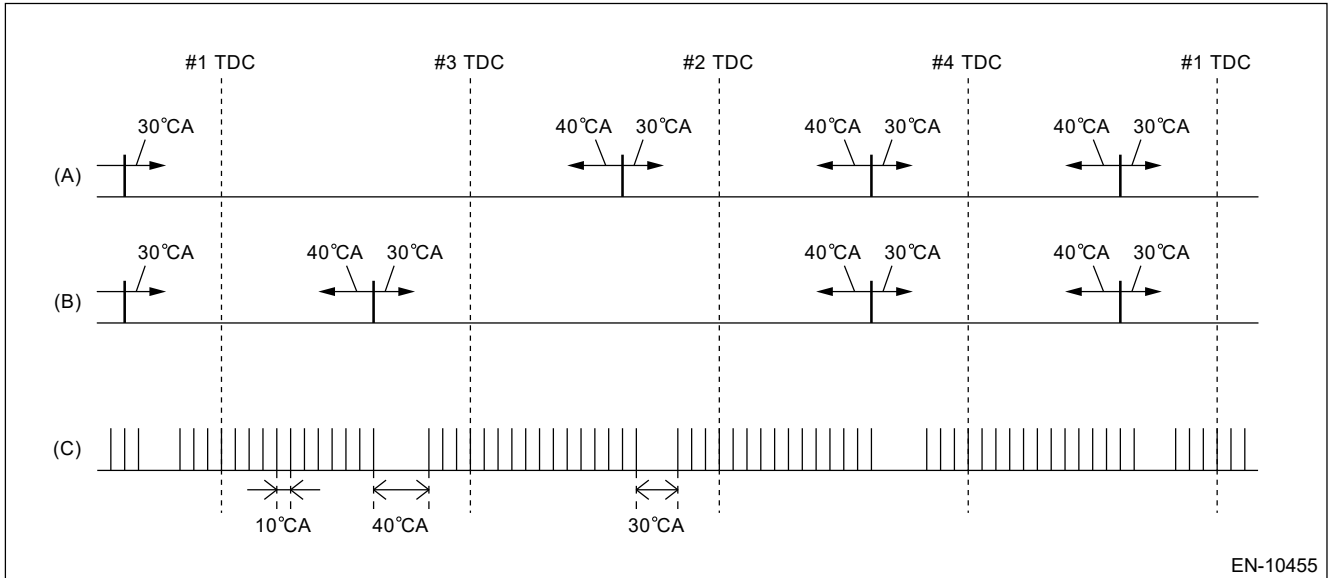
- Poor contact of ECM connector
- Poor contact of crankshaft position sensor connector
- Poor contact of coupling connector

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the crankshaft position sensor.

Judge as NG when the crank signal is not input even though the starter was rotated.

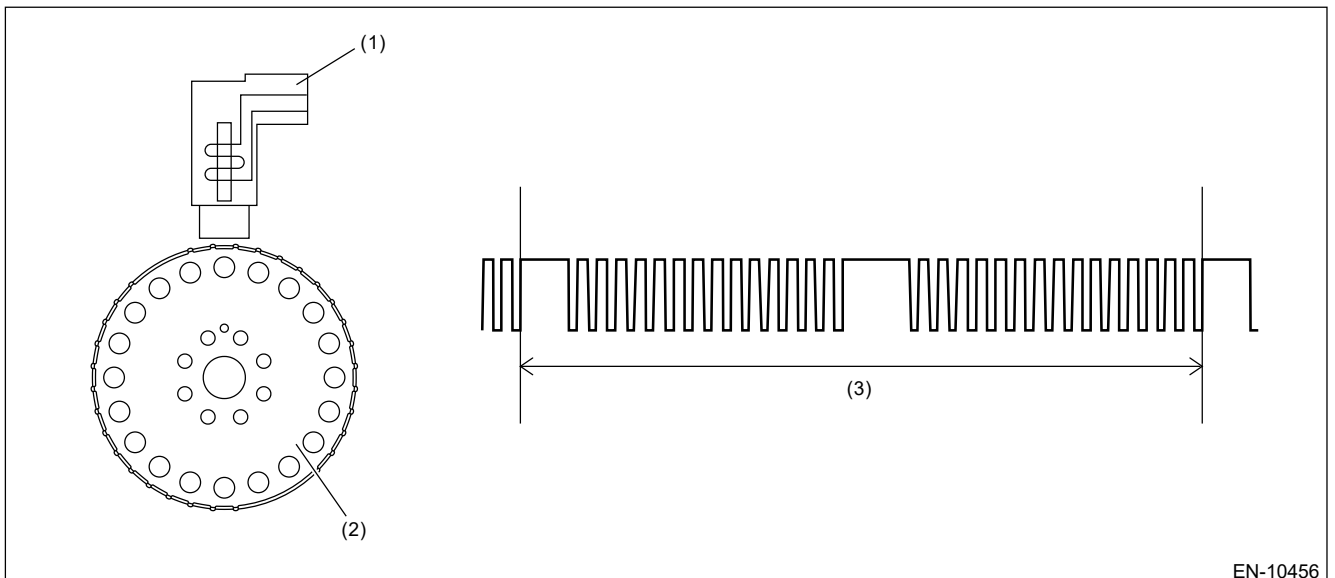
2. COMPONENT DESCRIPTION



(A) Intake cam signal RH

(B) Intake cam signal LH

(C) Crankshaft signal



(1) Crankshaft position sensor

(2) Crankshaft position sensor plate

(3) One crankshaft rotation plate

3. EXECUTION CONDITION

Secondary Parameters	Execution condition

Battery voltage	$\geq 8\text{ V}$
-----------------	-------------------

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Number of crankshaft position sensor signals during cranking	= 0

Time needed for diagnosis: 3000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0336 CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Engine stalls.
- Failure of engine to start

Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

1. CHECK CONDITION OF CRANKSHAFT POSITION SENSOR. 


Turn the ignition switch to OFF.

Is the crankshaft position sensor installation bolt tightened securely?

Yes

 [Go to 2.](#)


No

Tighten the crankshaft position sensor installation bolt securely.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor.](#)

2. CHECK CRANKSHAFT POSITION SENSOR PLATE. 

Is there crack or damage in the crankshaft position sensor plate teeth?

Yes

Replace the crankshaft position sensor plate.  [Ref. to MECHANICAL\(H4DOTC\)>Cylinder Block.](#)

No

 [Go to 3.](#)

3. CHECK INSTALLATION CONDITION OF TIMING CHAIN. 


Turn the crankshaft, and align alignment mark on crank sprocket with alignment mark on cylinder block.

ST 18252AA000 CRANKSHAFT SOCKET

Is the timing chain dislocated from its proper position?



Yes

Correct the installation condition of timing chain.  [Ref. to MECHANICAL\(H4DOTC\)>Timing Chain Assembly.](#)

No

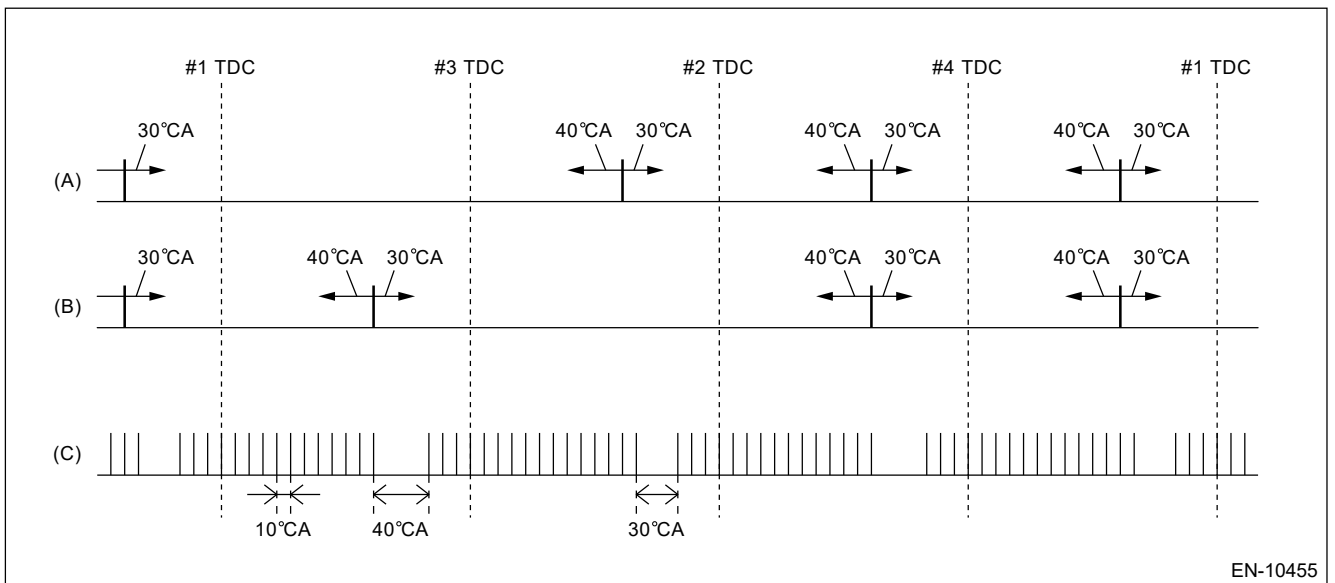
Replace the crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect for faults in crankshaft position sensor output properties.

Judge as NG when there is a problem in the number of crankshaft signals for every revolution of crankshaft.

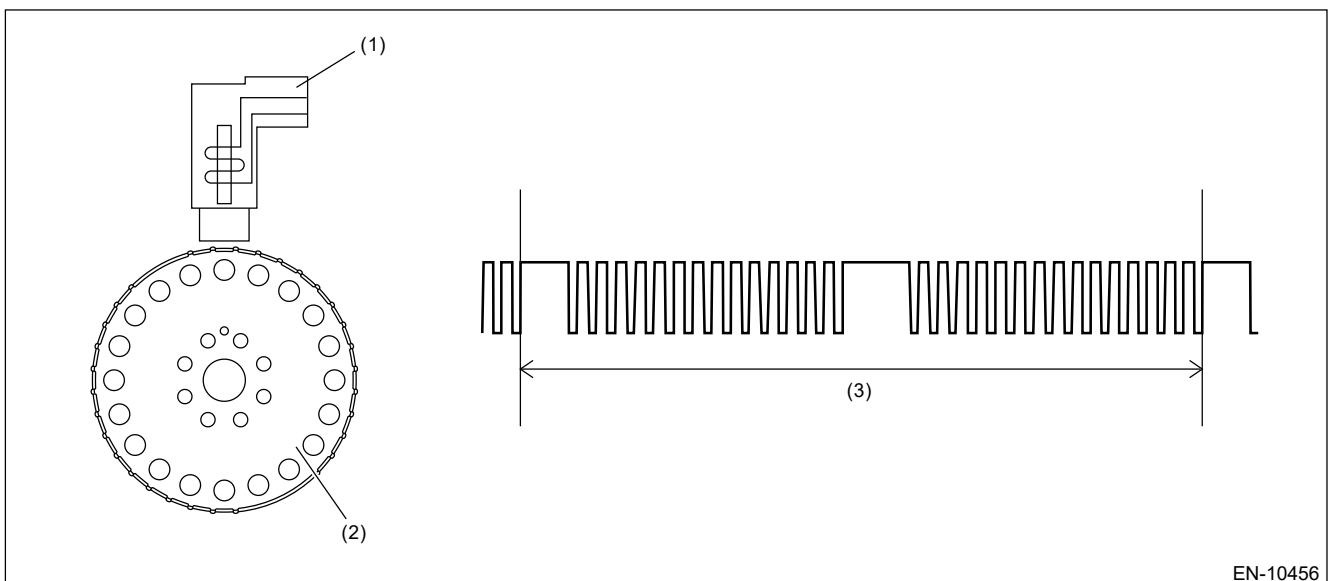
2. COMPONENT DESCRIPTION



(A) Intake cam signal RH

(B) Intake cam signal LH

(C) Crankshaft signal



(1) Crankshaft position sensor

(2) Crankshaft position sensor
plate

(3) One crankshaft rotation

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Diagnosis 1

Judgment value

Malfunction Criteria	Threshold Value
Amount of crankshaft position sensor signals during 0.5 revs of crankshaft	< 14 or ≥ 20

Diagnosis 2

Judgment value

Malfunction Criteria	Threshold Value
$ (\text{Present value of diagnosis 1}) - (\text{Previous value of diagnosis 1}) $	$\neq 1$

Time needed for diagnosis: 10 engine revs.

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 1 OR SINGLE SENSOR



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

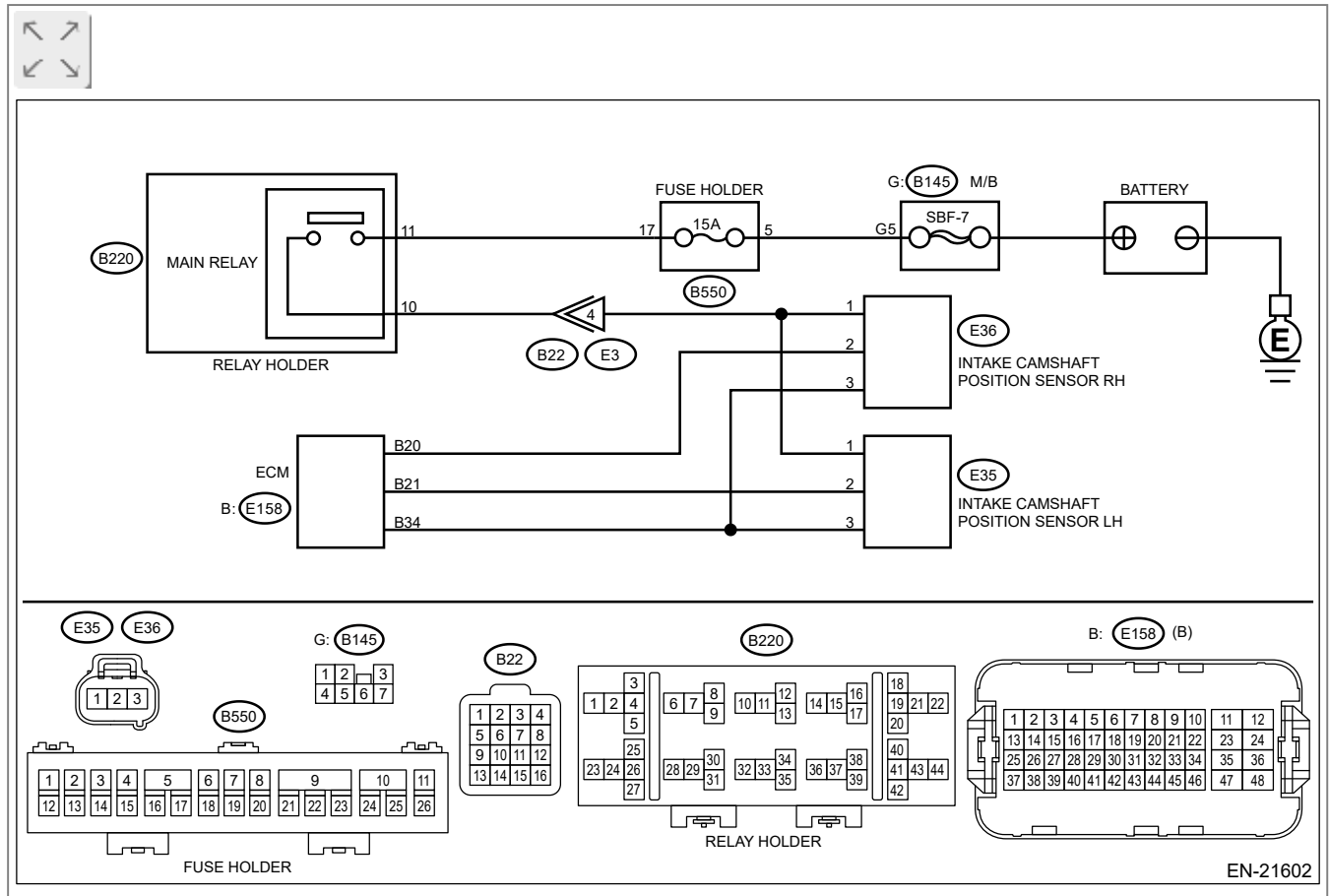
- Engine stalls.
- Failure of engine to start

Caution:

- **After servicing or replacing faulty parts, perform Clear Memory**  **Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode**  **Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from camshaft position sensor.
3. Turn the ignition switch to ON.


4. Measure the voltage between camshaft position sensor connector and engine ground.

Connector & terminal

(E36) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit or short circuit to ground in harness between main relay connector and camshaft position sensor connector**
- **Poor contact of coupling connector**

2. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.

- 1.** Turn the ignition switch to OFF.
- 2.** Disconnect the connector from ECM.
- 3.** Measure the resistance between ECM and camshaft position sensor connector.

Connector & terminal

(E158) No. 20 — (E36) No. 2:

(E158) No. 34 — (E36) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and camshaft position sensor connector**
- **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.

Measure the resistance between camshaft position sensor connector and engine ground.

Connector & terminal

(E36) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair short circuit to ground in harness between ECM and camshaft position sensor connector.

4. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.

Measure the voltage between camshaft position sensor connector and engine ground.

Connector & terminal


(E36) No. 2 (+) – Engine ground (–):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in the harness between ECM and camshaft position sensor connector.


No

 [Go to 5.](#)


5. CHECK CONDITION OF CAMSHAFT POSITION SENSOR.

Is the camshaft position sensor installation bolt tightened securely?


Yes

 [Go to 6.](#)

No

Tighten the camshaft position sensor installation bolt securely.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Camshaft Position Sensor>INSTALLATION.](#)

6. CHECK CAMSHAFT POSITION SENSOR.

Check the waveform of the camshaft position sensor.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Engine Control Module \(ECM\) I/O Signal.](#)

Is there any abnormality in waveform?

Yes

Replace the camshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Camshaft Position Sensor.](#)

No

Repair the following item.

- Poor contact of ECM connector
- Poor contact of camshaft position sensor connector

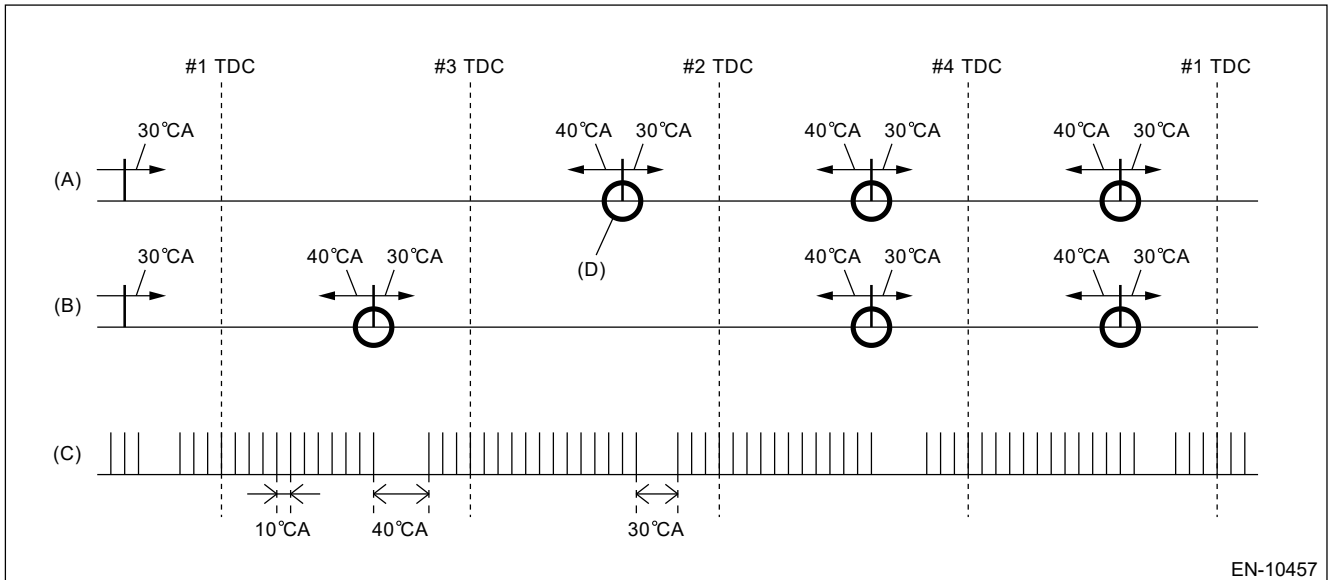
- Poor contact of coupling connector

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the camshaft position sensor.

When there is no camshaft position signal input continuously, judge as NG.

2. COMPONENT DESCRIPTION



(A) Intake cam signal RH

(B) Intake cam signal LH

(C) Crankshaft signal

(D) Camshaft position signal:

When normal, there will be 3 camshaft position signals for every 2 crankshaft revolutions.

3. EXECUTION CONDITION

Diagnosis 1

Secondary Parameters	Execution condition
Battery voltage	$\geq 8 \text{ V}$

Diagnosis 2

Secondary Parameters	Execution condition
Battery voltage	$\geq 8 \text{ V}$
Elapsed time after starting the engine	$\geq 200 \text{ ms}$

4. GENERAL DRIVING CYCLE

Diagnosis 1: Perform the diagnosis only once.

Diagnosis 2: Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Diagnosis 1

Judge as NG when no input status of camshaft position sensor signal continues for 3 sec. during cranking.

Judgment value

Malfunction Criteria	Threshold Value
Number of camshaft position sensor signals during cranking	= 0

Time needed for diagnosis: 3 seconds

Diagnosis 2

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Amount of camshaft position sensor signals during 1.5 revs of crankshaft	= 0


Time needed for diagnosis: 6 engine revs.

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0341 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 1 OR SINGLE SENSOR

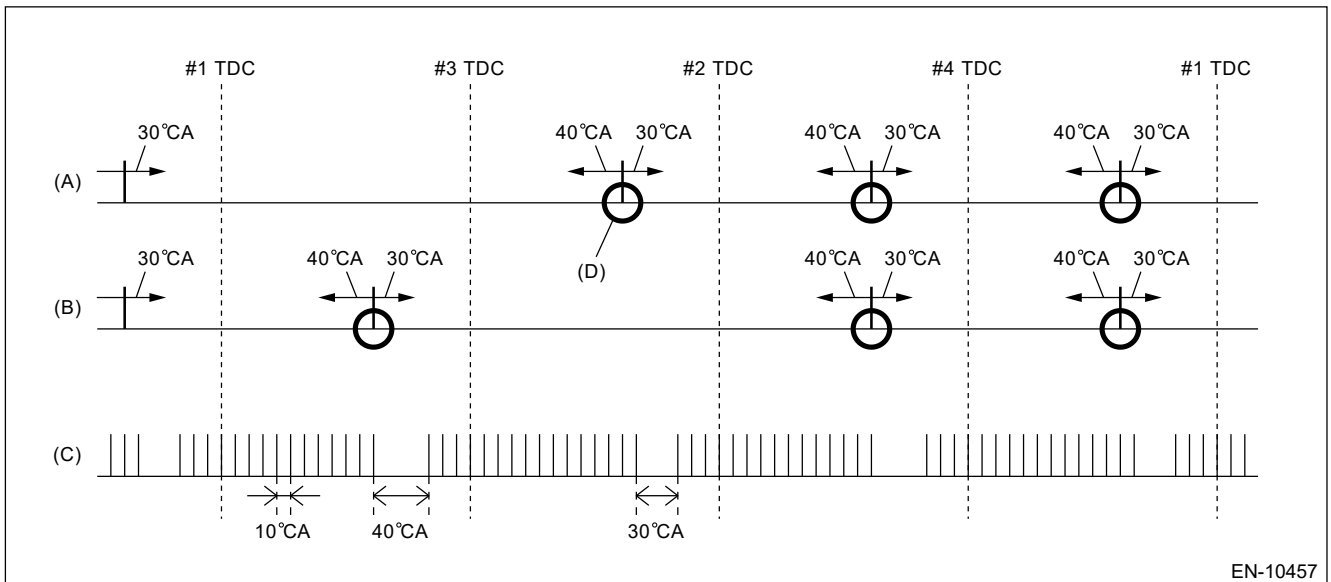
Note:

For the diagnostic procedure, refer to DTC P0340.  Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 1 OR SINGLE SENSOR.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of camshaft position sensor property.
 Judge as NG when the number of camshaft signals remains abnormal.

2. COMPONENT DESCRIPTION



EN-10457

(A) Intake cam signal RH (B) Intake cam signal LH (C) Crankshaft signal

(D) Camshaft position signal:
 When normal, there will be 3 camshaft position signals for every 2 crankshaft revolutions.

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
[Battery voltage]	≥ 8 V

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the condition continues where the amount of camshaft position sensor signals is other than 3 times during 2 revs of crankshaft.

Judgment Value

Malfunction Criteria	Threshold Value
Amount of camshaft position sensor signal during 2 revs of crankshaft	≠ 3 time (s)

Time Needed for Diagnosis: Engine 2 revolutions × 4 times

Malfunction Indicator Light Illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0345 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 2



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

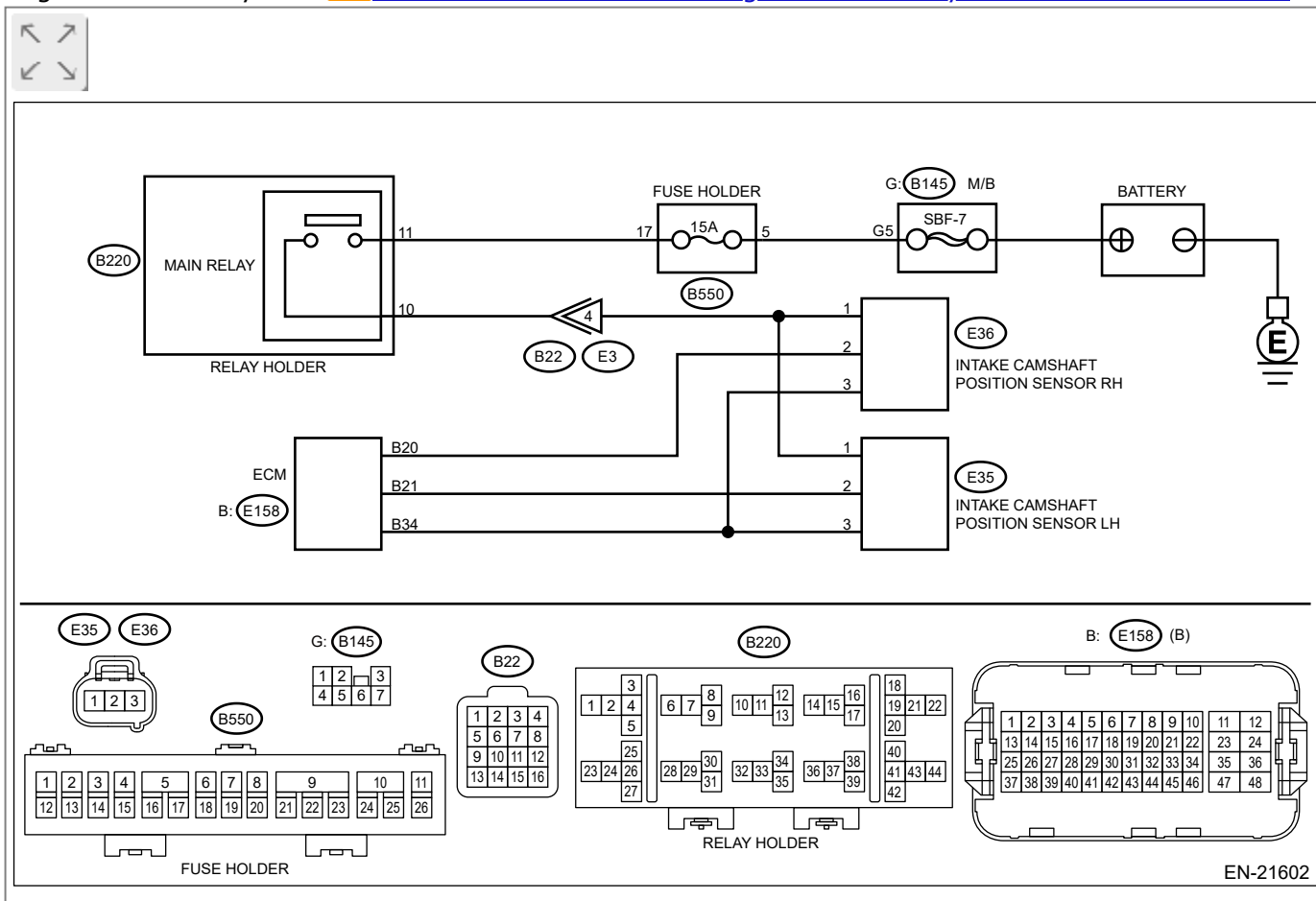
- Engine stalls.
- Failure of engine to start

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from camshaft position sensor.

3. Turn the ignition switch to ON.
4. Measure the voltage between camshaft position sensor connector and engine ground.

Connector & terminal

(E35) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- Open circuit or short circuit to ground in harness between main relay connector and camshaft position sensor connector
- Poor contact of coupling connector

2. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM and camshaft position sensor connector.

Connector & terminal

(E158) No. 21 — (E35) No. 2:

(E158) No. 34 — (E35) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit in harness between ECM and camshaft position sensor connector.

3. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.

Measure the resistance between camshaft position sensor connector and engine ground.

Connector & terminal

(E35) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?



 [Go to 4.](#)

Yes

No

Repair short circuit to ground in harness between ECM and camshaft position sensor connector.

4. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.



Measure the voltage between camshaft position sensor connector and engine ground.

Connector & terminal

(E35) No. 2 (+) — Engine ground (–):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in the harness between ECM and camshaft position sensor connector.

No

 [Go to 5.](#)

5. CHECK CONDITION OF CAMSHAFT POSITION SENSOR.




Is the camshaft position sensor installation bolt tightened securely?

Yes


 [Go to 6.](#)

No

Tighten the camshaft position sensor installation bolt securely.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Camshaft Position Sensor>INSTALLATION.](#)

6. CHECK CAMSHAFT POSITION SENSOR.



Check the waveform of the camshaft position sensor.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Engine Control Module \(ECM\) I/O Signal.](#)

Is there any abnormality in waveform?

Yes

Replace the camshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Camshaft Position Sensor.](#)

No


Repair the following item.

- Poor contact of ECM connector

- Poor contact of camshaft position sensor connector
- Poor contact of coupling connector

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to DTC P0340.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 1 OR SINGLE SENSOR.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P0346 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 2

Note:

For the diagnostic procedure, refer to DTC P0345.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0345 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 2.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0341.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0341 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 1 OR SINGLE SENSOR.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

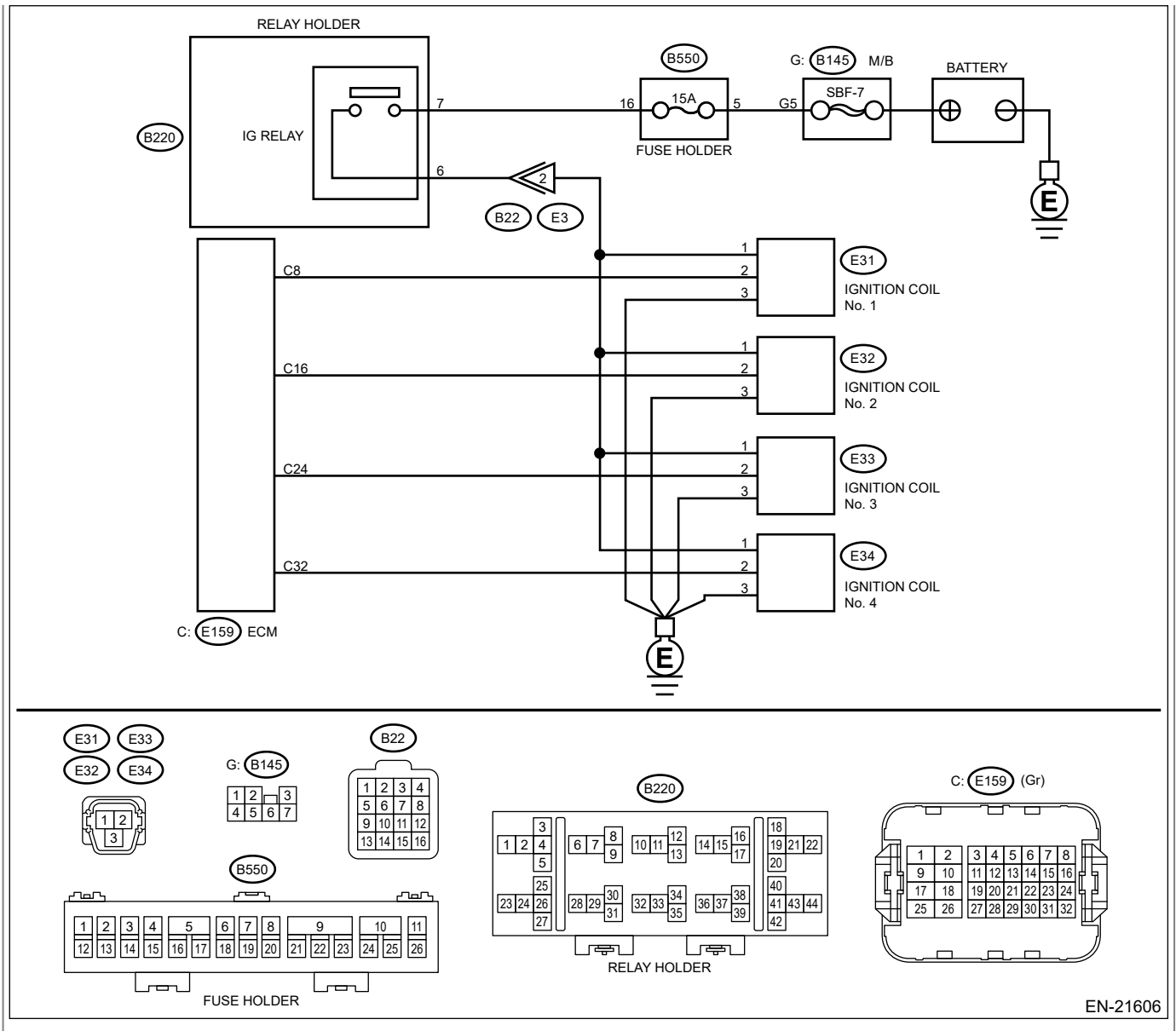
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21606

1. CHECK IGNITION COIL POWER SUPPLY CIRCUIT.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from ignition coil.
3. Turn the ignition switch to ON.
4. Measure the voltage between ignition coil connector and engine ground.

Connector & terminal

- DTC P0351; (E31) No. 1 (+) – Engine ground (-):
- DTC P0352; (E32) No. 1 (+) – Engine ground (-):
- DTC P0353; (E33) No. 1 (+) – Engine ground (-):
- DTC P0354; (E34) No. 1 (+) – Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open or short to ground in harness of power supply circuit**
- **Blown out of fuse**
- **Poor contact of IG relay connector**
- **Poor contact of coupling connector**
- **Faulty IG relay**

2. CHECK HARNESS OF IGNITION COIL GROUND CIRCUIT.

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between ignition coil connector and engine ground.

Connector & terminal

DTC P0351; (E31) No. 2 — Engine ground:


DTC P0352; (E32) No. 2 — Engine ground:

DTC P0353; (E33) No. 2 — Engine ground:

DTC P0354; (E34) No. 2 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit in harness between ignition coil connector and engine grounding terminal.

3. CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance between ignition coil connector and engine ground.

Connector & terminal

DTC P0351; (E31) No. 3 — Engine ground:

DTC P0352; (E32) No. 3 — Engine ground:

DTC P0353; (E33) No. 3 — Engine ground:

DTC P0354; (E34) No. 3 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair the ground short circuit of harness between ECM connector and ignition coil connector.

4. CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR.




Measure the resistance of harness between ECM connector and ignition coil connector.

Connector & terminal

- DTC P0351; (E159) No. 8 — (E31) No. 3:
- DTC P0352; (E159) No. 16 — (E32) No. 3:
- DTC P0353; (E159) No. 24 — (E33) No. 3:
- DTC P0354; (E159) No. 32 — (E34) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 5.](#)

No

Repair the open circuit in harness between ECM connector and ignition coil connector.

5. CHECK FOR POOR CONTACT.



Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes



Repair the poor contact of ECM connector.

No

 [Go to 6.](#)


6. CHECK SPARK PLUG CONDITION.




1. Remove the spark plug of the corresponding cylinder.  [Ref. to IGNITION\(H4DOTC\)>Spark Plug>REMOVAL.](#)
2. Check the spark plug condition.  [Ref. to IGNITION\(H4DOTC\)>Spark Plug>INSPECTION.](#)

Is the spark plug condition normal?

Yes

Replace the ignition coil.  [Ref. to IGNITION\(H4DOTC\)>Ignition Coil.](#)

No

Replace the spark plug.  [Ref. to IGNITION\(H4DOTC\)>Spark Plug.](#)

1. OUTLINE OF DIAGNOSIS

Based on the self-diagnostic result of the ignition coil driving IC, judge the ignition coil driving circuit as normal or abnormal.

The ignition coil driving IC detects "no ignition" status as a malfunction.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Fault signal from ignition drive IC	ON


Time needed for diagnosis: 2500 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0352 IGNITION COIL "B" PRIMARY CONTROL CIRCUIT/OPEN

Note:

For the diagnostic procedure, refer to DTC P0351.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN.](#)

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to DTC P0351.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0353 IGNITION COIL "C" PRIMARY CONTROL CIRCUIT/OPEN

Note:

For the diagnostic procedure, refer to DTC P0351.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN.](#)

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to DTC P0351.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P0354 IGNITION COIL "D" PRIMARY CONTROL CIRCUIT/OPEN

Note:

For the diagnostic procedure, refer to DTC P0351.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0351.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0365 CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 1



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

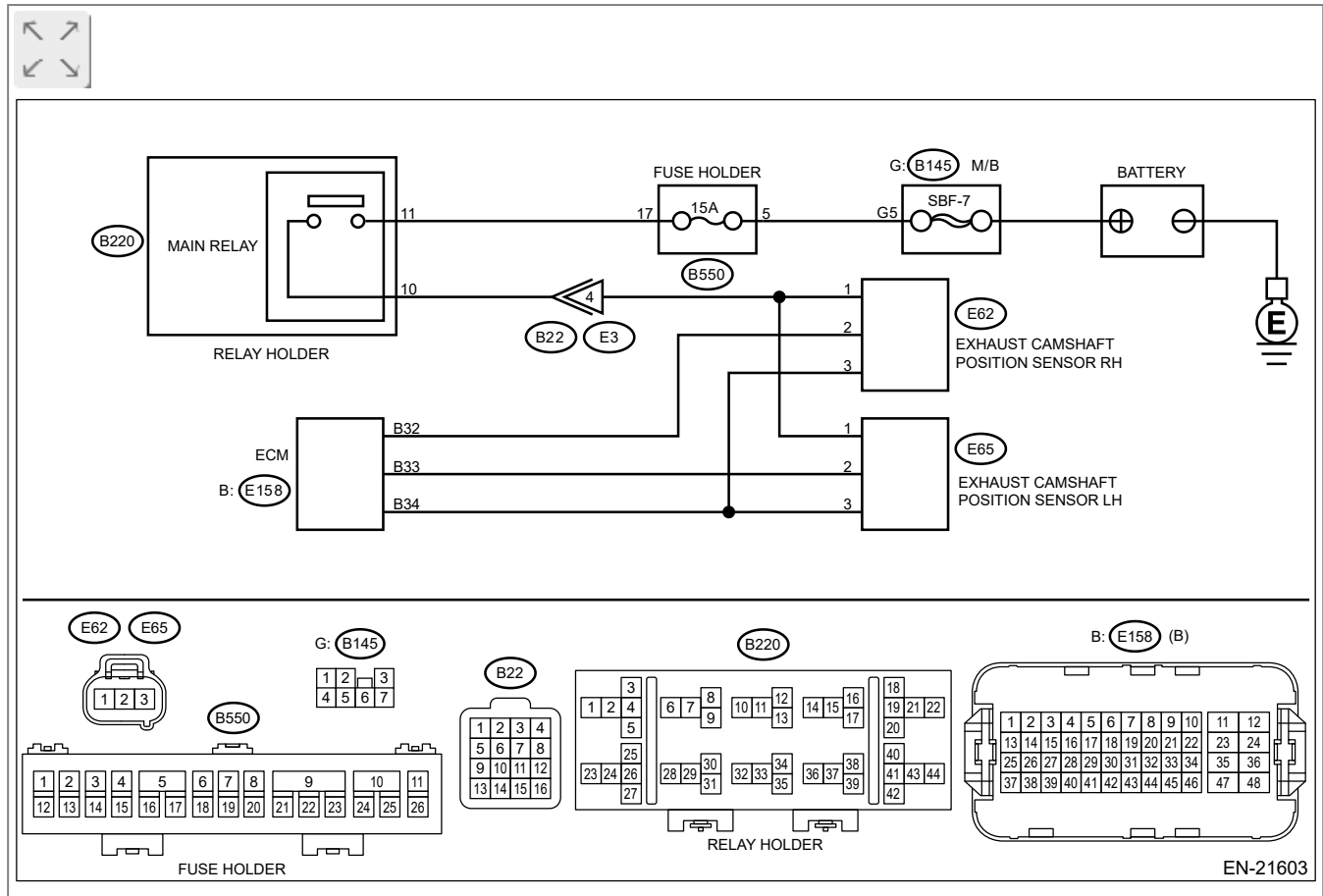
- Engine stalls.
- Failure of engine to start

Caution:

- **After servicing or replacing faulty parts, perform Clear Memory**  **Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode**  **Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from camshaft position sensor.
3. Turn the ignition switch to ON.


4. Measure the voltage between camshaft position sensor connector and engine ground.

Connector & terminal

(E62) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between main relay and camshaft position sensor connector**
- **Poor contact of coupling connector**

2. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.

- 1.** Turn the ignition switch to OFF.
- 2.** Disconnect the connector from ECM.
- 3.** Measure the resistance between ECM and camshaft position sensor connector.

Connector & terminal

(E158) No. 32 — (E62) No. 2:

(E158) No. 34 — (E62) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit in harness between ECM and camshaft position sensor connector.

3. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.

Measure the resistance between camshaft position sensor connector and engine ground.

Connector & terminal

(E62) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair short circuit to ground in harness between ECM and camshaft position

sensor connector.

4. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.

Measure the voltage between camshaft position sensor connector and engine ground.

Connector & terminal

(E62) No. 2 (+) – Engine ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in the harness between ECM and camshaft position sensor connector.

No

 [Go to 5.](#)


5. CHECK CONDITION OF CAMSHAFT POSITION SENSOR.

Is the camshaft position sensor installation bolt tightened securely?


Yes

 [Go to 6.](#)

No

Tighten the camshaft position sensor installation bolt securely.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Camshaft Position Sensor>INSTALLATION.](#)

6. CHECK CAMSHAFT POSITION SENSOR.

Check the waveform of the camshaft position sensor.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Engine Control Module \(ECM\) I/O Signal.](#)

Is there any abnormality in waveform?

Yes

Replace the camshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Camshaft Position Sensor.](#)

No

Repair the following item.

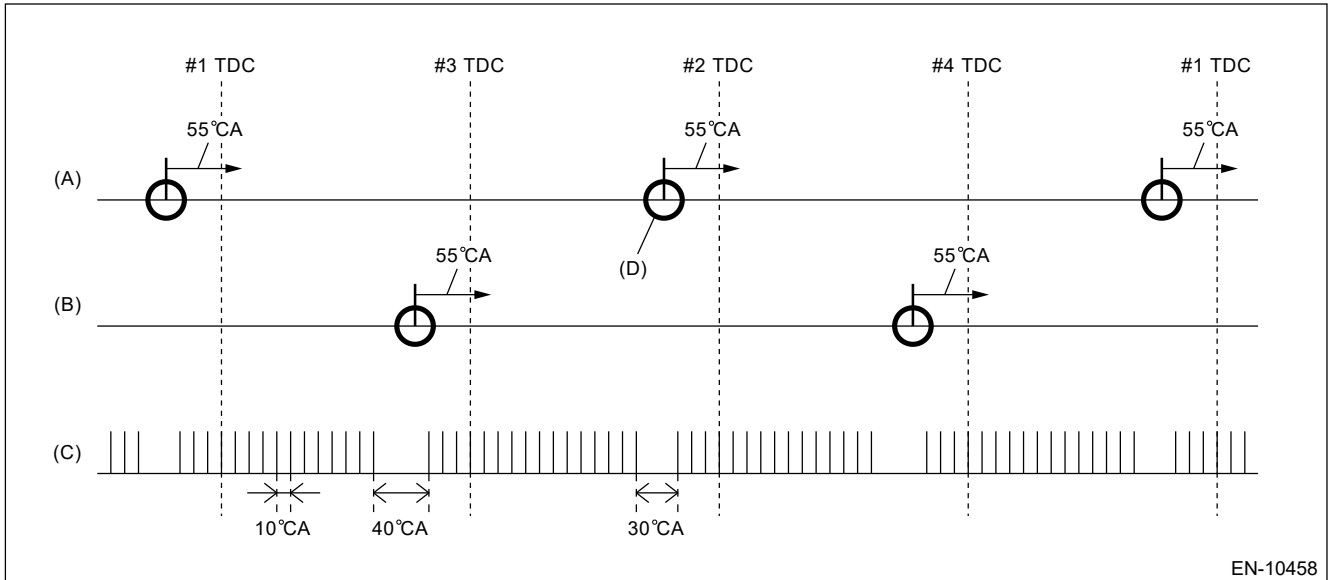
- Poor contact of ECM connector
- Poor contact of camshaft position sensor connector
- Poor contact of coupling connector

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the camshaft position sensor.

When there is no camshaft position signal input continuously, judge as NG.

2. COMPONENT DESCRIPTION



(A) Exhaust cam signal RH (B) Exhaust cam signal LH (C) Crankshaft signal

(D) Camshaft position signal:
When normal, there will be 2
camshaft position signals for
every 2 crankshaft
revolutions.

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Elapsed time after starting the engine	$\geq 0.2 \text{ s}$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Amount of camshaft position sensor signals during 1.5 revs	= 0

| of crankshaft |

Time needed for diagnosis: 6 engine revs.

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0366 CAMSHAFT POSITION SENSOR "B" CIRCUIT RANGE/PERFORMANCE BANK 1

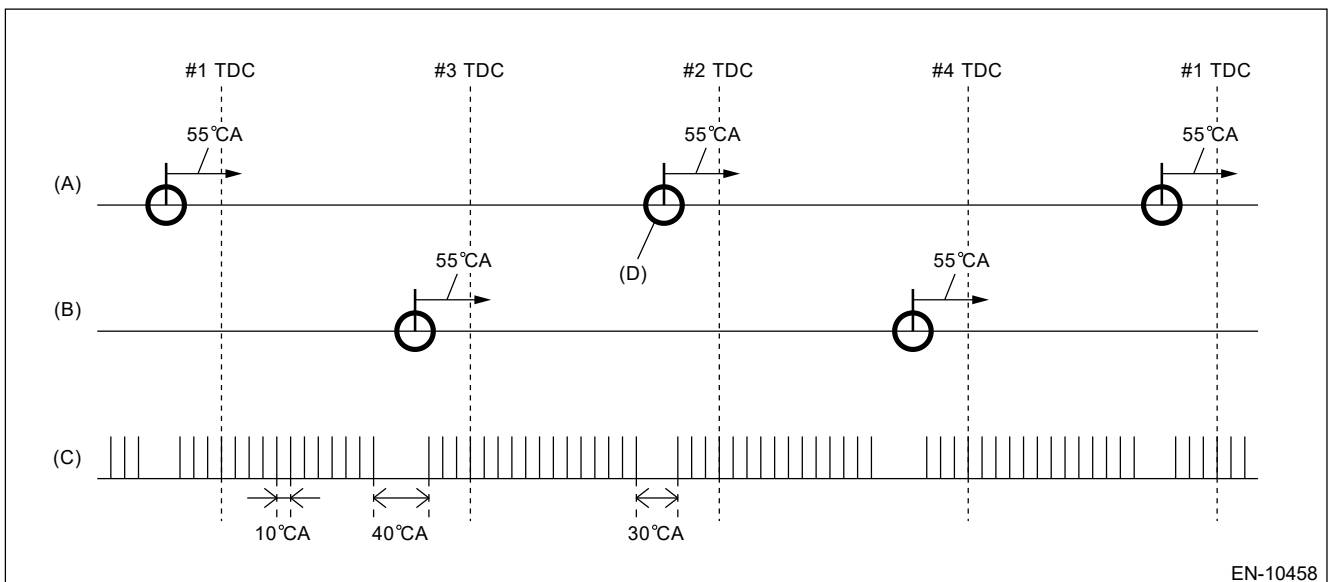
Note:

For the diagnostic procedure, refer to DTC P0365.  Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0365 CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 1.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of camshaft position sensor property.
Judge as NG when the number of camshaft signals remains abnormal.

2. COMPONENT DESCRIPTION



- (A) Exhaust cam signal RH
- (B) Exhaust cam signal LH
- (C) Crankshaft signal
- (D) Camshaft position signal:
When normal, there will be 2 camshaft position signals for every 2 crankshaft revolutions.

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the condition continues where the number of camshaft position sensor signals are not 2 times during 2 revs of crankshaft.

Judgment value

Malfunction Criteria	Threshold Value
Amount of camshaft sensor signal during 2 revs of crankshaft	≠ 2 times

Time needed for diagnosis: Engine two revolutions × 4 times

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0390 CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 2



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

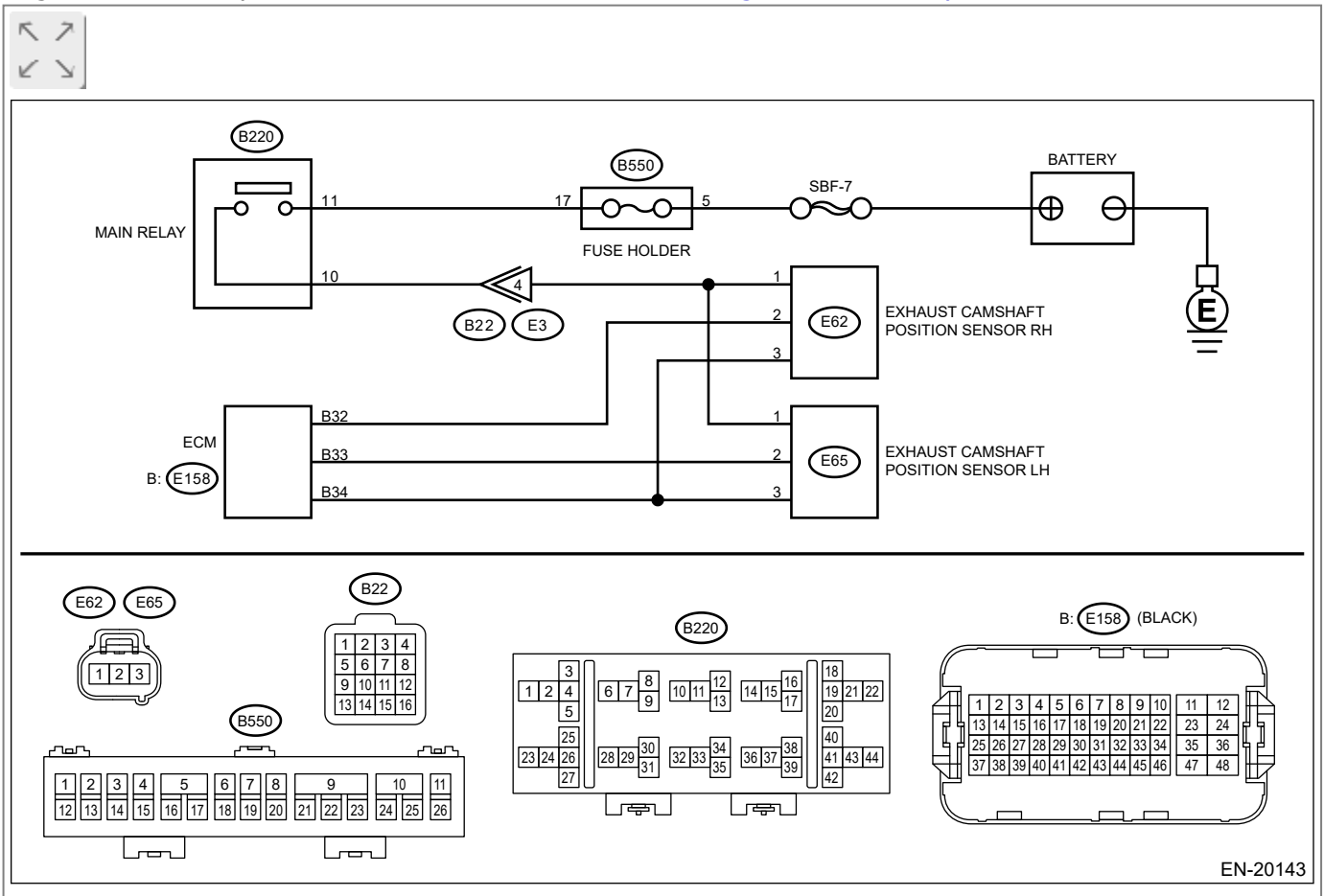
- Engine stalls.
- Failure of engine to start

Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



EN-20143

1. CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from camshaft position sensor.

3. Turn the ignition switch to ON.
4. Measure the voltage between camshaft position sensor connector and engine ground.

Connector & terminal

(E65) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- Open circuit or short circuit to ground in harness between main relay connector and camshaft position sensor connector
- Poor contact of coupling connector

2. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM and camshaft position sensor connector.

Connector & terminal

(E158) No. 33 — (E65) No. 2:

(E158) No. 34 — (E65) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- Open circuit in harness between ECM and camshaft position sensor connector
- Poor contact of coupling connector

3. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.


Measure the resistance between camshaft position sensor connector and engine ground.

Connector & terminal

(E65) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 4.](#)

No

Repair short circuit to ground in harness between ECM and camshaft position sensor connector.

4. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR.

Measure the voltage between camshaft position sensor connector and engine ground.

Connector & terminal

(E65) No. 2 (+) — Engine ground (–):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in the harness between ECM and camshaft position sensor connector.

No

 [Go to 5.](#)


5. CHECK CONDITION OF CAMSHAFT POSITION SENSOR.

Is the camshaft position sensor installation bolt tightened securely?


Yes

 [Go to 6.](#)

No


Tighten the camshaft position sensor installation bolt securely.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Camshaft Position Sensor>INSTALLATION.](#)

6. CHECK CAMSHAFT POSITION SENSOR.

Check the waveform of the camshaft position sensor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Engine Control Module \(ECM\) I/O Signal.](#)

Is there any abnormality in waveform?

Yes

Replace the camshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL](#)

[SYSTEMS\)\(H4DOTC\)>Camshaft Position Sensor.](#)

No

Repair the following item.

- Poor contact of ECM connector
- Poor contact of camshaft position sensor connector
- Poor contact of coupling connector

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to DTC P0365.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0365 CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 1.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P0391 CAMSHAFT POSITION SENSOR "B" CIRCUIT RANGE/PERFORMANCE BANK 2

Note:

For the diagnostic procedure, refer to DTC P0390.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0390 CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 2.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0366.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0366 CAMSHAFT POSITION SENSOR "B" CIRCUIT RANGE/PERFORMANCE BANK 1.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0400 EGR "A" FLOW



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Movement performance problem when engine is low speed.
- Improper idling
- Movement performance problem


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

1. CHECK CURRENT DATA.

1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Mani. Absolute Pressure].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Mani. Absolute Pressure] 53.3 kPa (400 mmHg, 15.75 inHg) or more?

Yes

Make sure that the EGR control valve, manifold absolute pressure sensor and throttle body are installed securely.

No

 [Go to 2.](#)

2. CHECK EGR CONTROL VALVE.


Remove the EGR control valve.

Are there any holes, clogged lines or foreign matters in the EGR system?

Yes

Repair the EGR system.

No

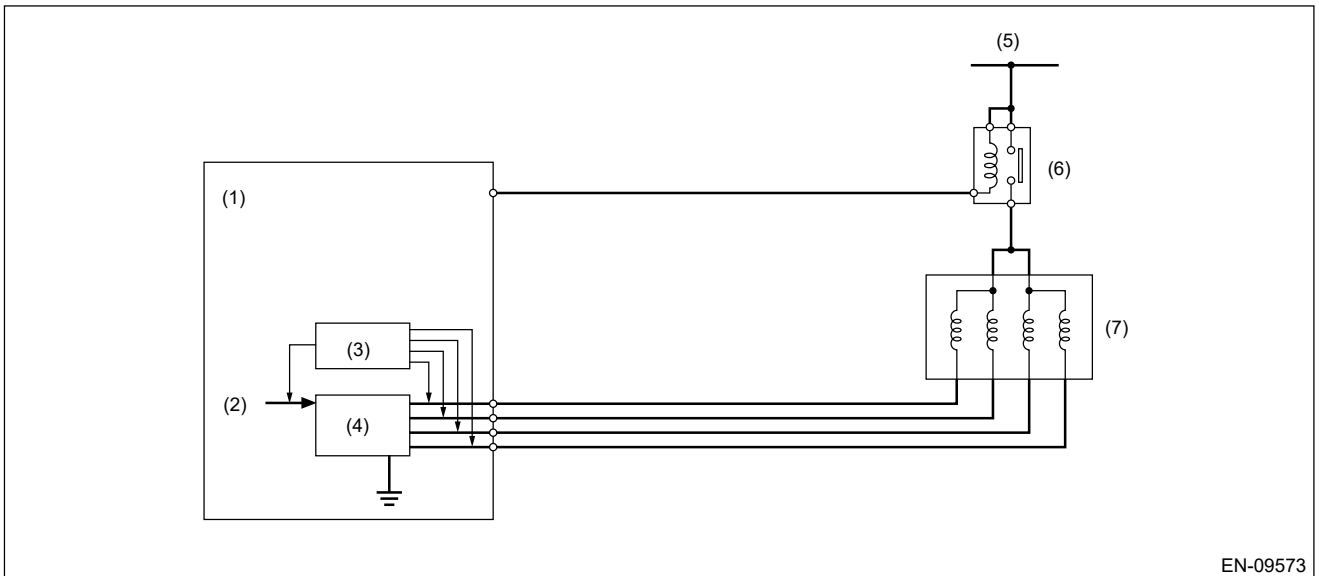
Replace EGR control valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION](#)

1. OUTLINE OF DIAGNOSIS

Detect EGR system malfunction.

Intake manifold pressure (negative pressure) is constant because the throttle valve is fully closed during deceleration fuel cut. At this time, when the EGR control valve is opened/closed, the intake manifold pressure will change. EGR System OK/NG is judged by the range of this change.

2. COMPONENT DESCRIPTION



EN-09573

- (1) Engine control module (ECM)
- (2) Computer unit (CPU)
- (3) Detecting circuit
- (4) Switching circuit
- (5) Battery voltage
- (6) Main relay
- (7) EGR control valve

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Barometric pressure	≥ 75.1 kPa (563 mmHg, 22.2 inHg)
Intake air temperature	≥ 0°
Engine speed	≥ 1300 rpm to < 5000 rpm
Vehicle speed	≥ 40 km/h (24.9 MPH)
Deceleration fuel cut for 3000 ms or more	Experienced
Neutral switch	OFF

4. GENERAL DRIVING CYCLE

During deceleration fuel cut from 40 km/h (24.9 MPH) or more, perform diagnosis only once. Be careful of vehicle speed and engine speed. (Diagnosis will not be completed if the vehicle speed and engine speed conditions become out of specification due to deceleration.)

5. DIAGNOSTIC METHOD

Measure the pressure values when the enable conditions are established, and perform diagnosis by calculating those results.

1. Label the intake manifold pressure value as PMOF1, which is observed when enable conditions are established, and set the EGR target step to 55 steps (nearly full open).
2. Label the intake manifold pressure value as PMON, which is observed after one second has passed since EGR target step was set to 55 steps (when the enable conditions were established), and set the EGR target step to 0.
3. Label the intake manifold pressure as PMOF2, which is observed after one second has passed since EGR target step was set to 0 (after two seconds have passed since the enable conditions were established).

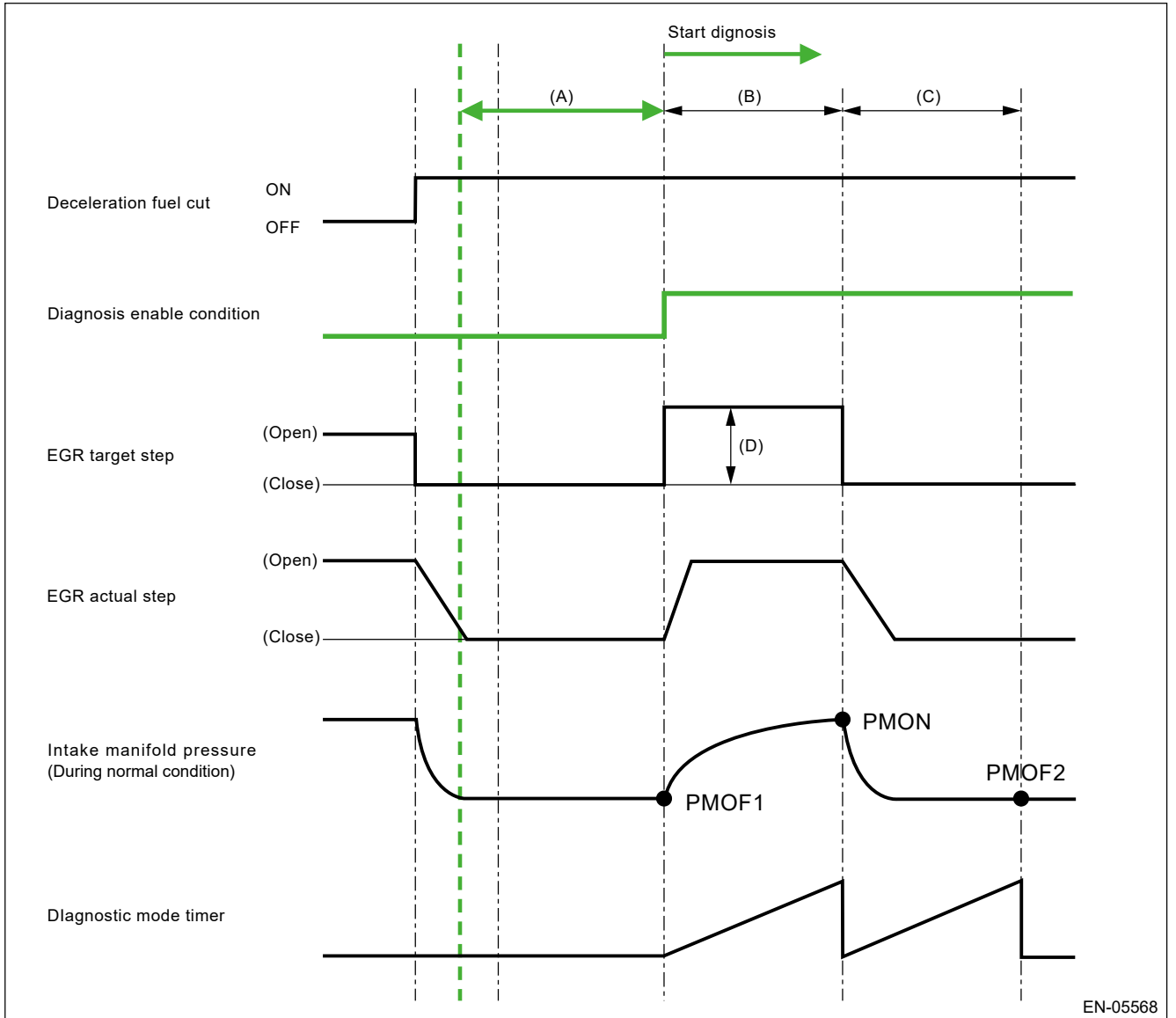
Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
$PMON - (PMOF1 + PMOF2)/2$	< 2.48 kPa (18.6 mmHg, 0.7 inHg)

Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



EN-05568

(A) 3000 ms

(B) 1000 ms

(C) 1000 ms

(D) 55 steps

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0420 CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD BANK 1



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Engine stalls.
- Idle mixture is out of specifications.

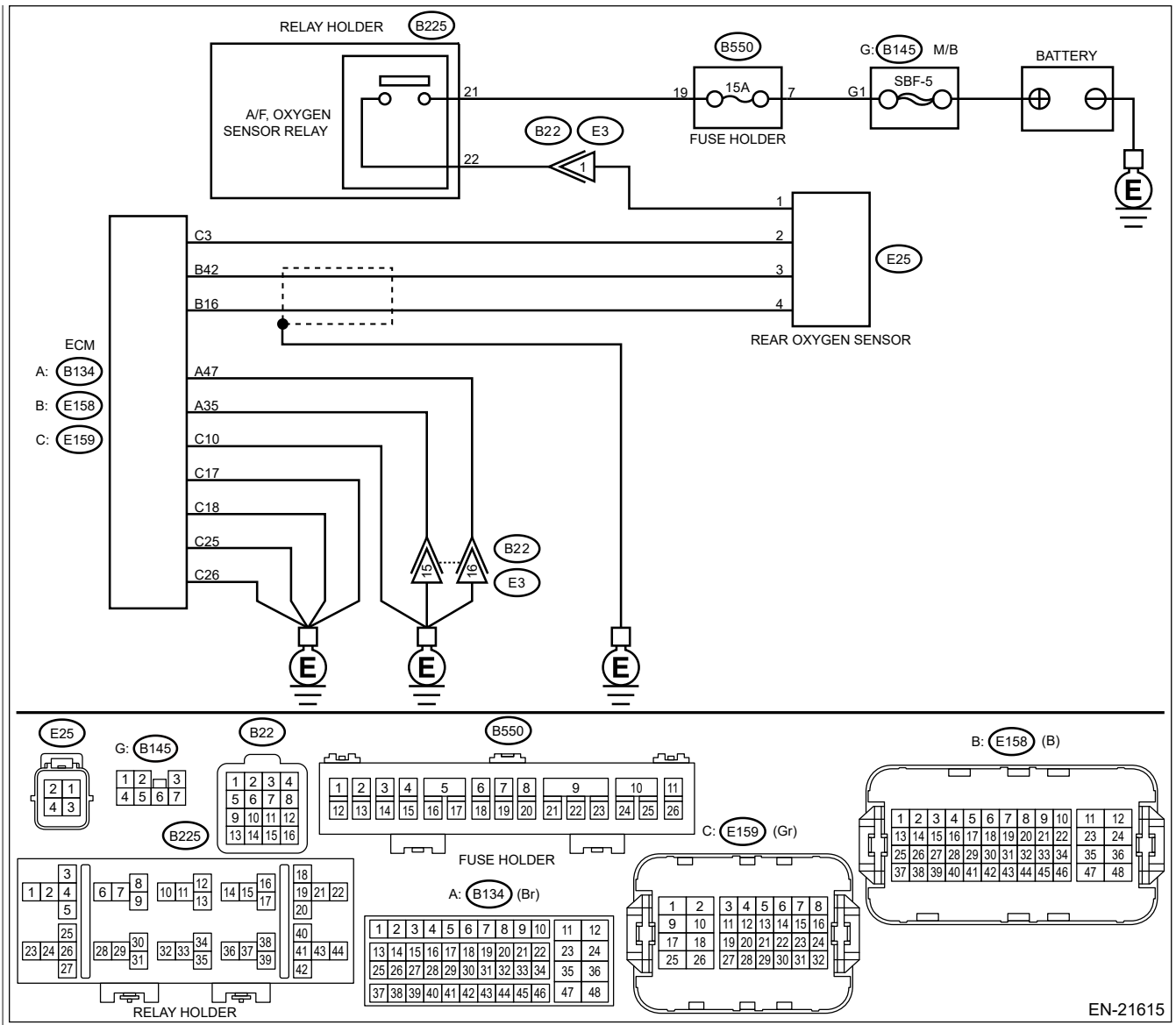
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21615

1. CHECK EXHAUST SYSTEM.

Check for gas leaks or air suction caused by loose or dislocated nuts and bolts, and open hole at exhaust pipes.

Note:

Check the following positions.

- Between cylinder head and front exhaust pipe
- Between front exhaust pipe and front catalytic converter
- Between front catalytic converter and rear catalytic converter
- Loose or improperly attached front oxygen (A/F) sensor or rear oxygen sensor

Is there any fault in exhaust system?

Yes

Repair or replace the exhaust system.  [Ref. to EXHAUST\(H4DOTC\)>General](#)

[Description.](#)

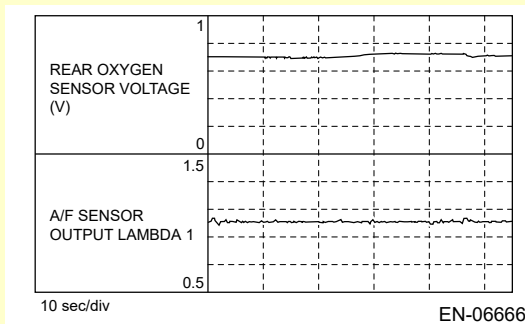
No

 [Go to 2.](#)

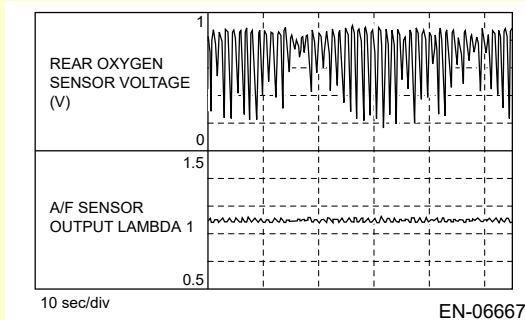
2. CHECK WAVEFORM DATA ON THE SUBARU SELECT MONITOR (WHILE DRIVING).



1. Drive at a constant speed between 80 — 112 km/h (50 — 70 MPH).
2. After 5 minutes have elapsed in the condition of step 1), use the Subaru Select Monitor while still driving to read the waveform data.
 - At normal condition



- At abnormal condition (numerous inversion)



Is a normal waveform displayed?

Yes

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

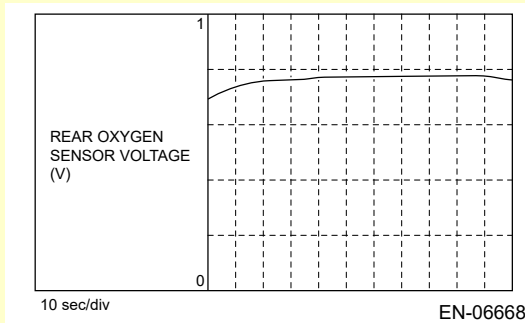
No

 [Go to 3.](#)

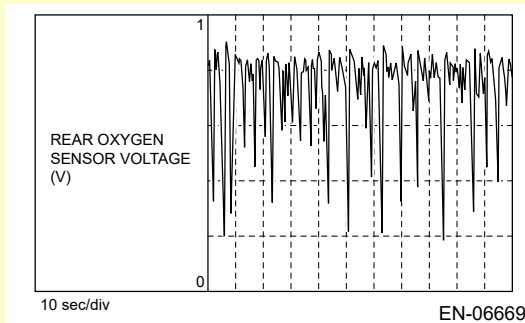
3. CHECK WAVEFORM DATA ON THE SUBARU SELECT MONITOR (WHILE IDLING).



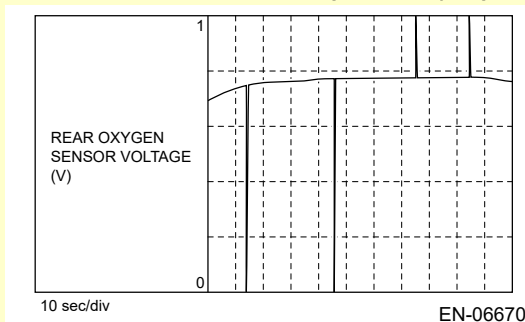
1. Run the engine at idle.
2. In the condition of step 1), use the Subaru Select Monitor to read the waveform data.
 - At normal condition



- At abnormal condition 1 (numerous inversion)



- At abnormal condition 2 (noise input)



Is a normal waveform displayed?

Yes

[Go to 4.](#)

No

- The waveform is displayed at abnormal condition 1: [Go to 4.](#)
- The waveform is displayed at abnormal condition 2: [Go to 5.](#)

4. CHECK CATALYTIC CONVERTER.




Is the catalytic converter damaged?

Yes

Replace the catalytic converter. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Front Catalytic Converter.](#) [Ref. to](#)

[EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Rear Catalytic Converter.](#)

No

 [Go to 5.](#)


5. CHECK REAR OXYGEN SENSOR CONNECTOR.

Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 6.](#)

6. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from rear oxygen sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and rear oxygen sensor connector.

Connector & terminal

(E158) No. 42 — (E25) No. 3:

(E158) No. 16 — (E25) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 7.](#)

No

Repair the open circuit of harness between ECM and rear oxygen sensor connector.

7. CHECK REAR OXYGEN SENSOR SHIELD.

1. Turn the ignition switch to OFF.
2. Expose the rear oxygen sensor connector body side harness sensor shield.
3. Measure the resistance between sensor shield and engine ground.

Is the resistance less than 1 Ω ?


Yes

 [Go to 8.](#)

No


Repair the open circuit of rear oxygen sensor harness.



8. CHECK ENGINE OIL AMOUNT AND EXHAUST GAS.

1. Check the engine oil amount.  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>INSPECTION.](#)
2. Check exhaust gas during idling.

Does the engine oil amount drop or white smoke emit from the muffler?

Yes

Check the engine, and repair the defective part.  [Ref. to MECHANICAL\(H4DOTC\)>Symptoms and causes>INSPECTION.](#)


After repairing the engine, replace the catalytic converter.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Front Catalytic Converter.](#)  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Rear Catalytic Converter.](#)

After the catalytic converter is replaced, perform step 2 to check the normal waveform is displayed, and then exit the procedure.

No



 [Go to 9.](#)

9. CHECK IGNITION SYSTEM.

1. Check the spark plug.  [Ref. to IGNITION\(H4DOTC\)>Spark Plug>INSPECTION.](#)
2. Check the status of the ignition coil connector and the spark plug terminal.


Is there any fault in the ignition system?

Yes



After repairing the ignition system, replace the catalytic converter.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Front Catalytic Converter.](#)  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Rear Catalytic Converter.](#)

After the catalytic converter is replaced, perform step 2 to check the normal waveform is displayed, and then exit the procedure.

No

 [Go to 10.](#)

10. CHECK FUEL SYSTEM.

1. Refer to and check the items in "Insufficient fuel supply to fuel injector" (except for "a. Fuel pump does not operate.") and "Leakage or blow out of fuel".  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel System Trouble in General>INSPECTION.](#)
2. Check throttle body.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Throttle](#)

[Body>INSPECTION.](#)

3. Check intake manifold. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Intake Manifold>INSPECTION.](#)

Is there any fault in the fuel system?

Yes

After repairing the fuel system, replace the catalytic converter. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Front Catalytic Converter.](#) [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Rear Catalytic Converter.](#)

After the catalytic converter is replaced, perform step 2 to check the normal waveform is displayed, and then exit the procedure.

No

[Go to 11.](#)

11. CHECK DTC.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".

[Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

After checking the DTC, replace the catalytic converter. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Front Catalytic Converter.](#) [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Rear Catalytic Converter.](#)

After the catalytic converter is replaced, perform step 2 to check the normal waveform is displayed, and then exit the procedure.

No

Replace the rear oxygen sensor. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Rear Oxygen Sensor.](#)

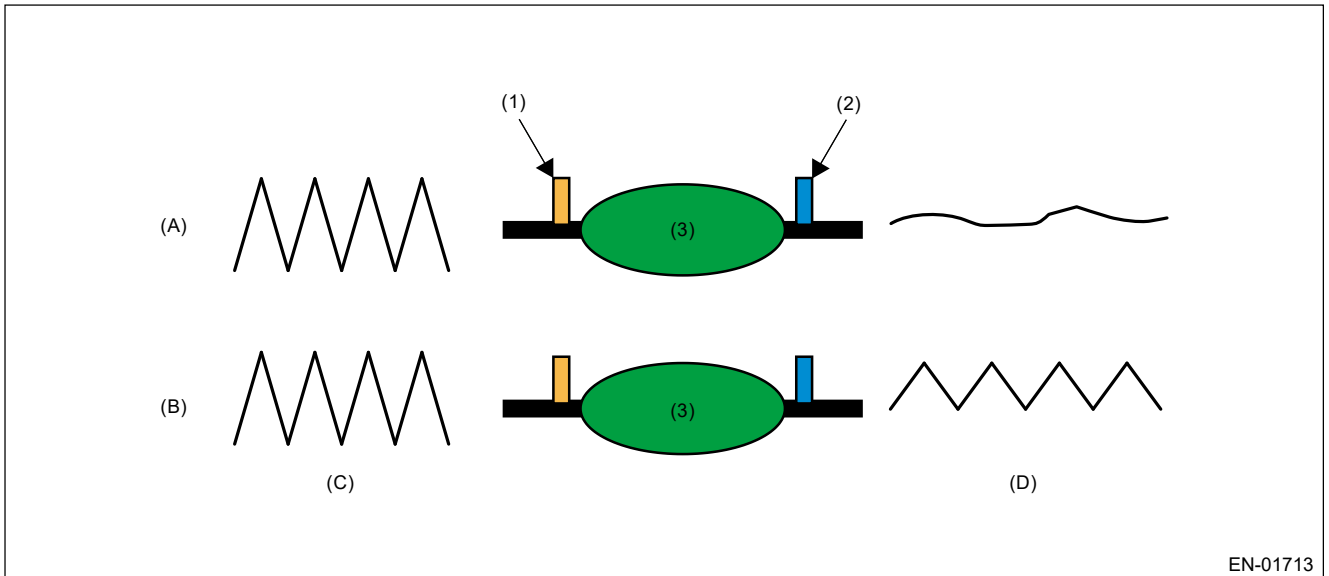
1. OUTLINE OF DIAGNOSIS

Detect the deterioration of the catalyst function.

Though the front oxygen sensor output would change slowly with a new catalyst, the sensor output with a deteriorated catalyst becomes high and the inversion time is shortened.

For this reason, the catalyst diagnosis is carried out by monitoring the front oxygen sensor output and comparing it with the front oxygen (A/F) sensor output.

2. COMPONENT DESCRIPTION



EN-01713

(A) Normal

(B) Deterioration

(C) Output waveform from the front oxygen (A/F) sensor

(D) Output waveform from the front oxygen sensor

(1) Front oxygen (A/F) sensor

(2) Front oxygen sensor

(3) Catalytic converter

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Barometric pressure	$\geq 75.1 \text{ kPa}$ (563 mmHg, 22.2 inHG)
Amount of intake air	$\geq 5 \text{ g/s}$ (0.18 oz/s) and $< 45 \text{ g/s}$ (1.59 oz/s)
Estimated catalyst temperature	$\geq 480^\circ\text{C}$ (896°F)
Vehicle speed	$\geq 40 \text{ km/h}$ (24.9 MPH)
Estimated temperature of the rear oxygen sensor element	$\geq 450^\circ\text{C}$ (842°F)
Sub feedback	In operation
Rear oxygen sensor output voltage after fuel cut	$\geq 0.55 \text{ V}$

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once at a constant vehicle speed of 40 km/h (24.9 MPH) or higher.

5. DIAGNOSTIC METHOD

After the enable conditions have been established, calculate the front oxygen (A/F) sensor lambda deviation sum value and the rear oxygen sensor output voltage deviation sum value in every 32 ms

× 4 times. If the front oxygen (A/F) sensor lambda deviation sum value is the predetermined value or more, calculate the diagnostic value.

If the duration of time while the following conditions are met is within the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Rear oxygen sensor output voltage deviation sum value / front oxygen (A/F) sensor lambda deviation sum value	> 9

Time Needed for Diagnosis: 30 — 55 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0441 EVAP SYSTEM (CPC) INCORRECT PURGE FLOW



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

Improper idling


Caution:

After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode>OPERATION.](#) and Inspection Mode  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode>PROCEDURE.](#)


1. CHECK FOR ANY OTHER DTC ON DISPLAY. 

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)


No

 [Go to 2.](#)

2. CHECK PURGE CONTROL SOLENOID VALVE. 

Operate the purge control solenoid valve using the Subaru Select Monitor.

Note:


For detailed procedures, refer to "Active Test".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Active Test.](#)

Does the purge control solenoid valve operate?

Yes

 [Go to 3.](#)

No

Replace the purge control solenoid valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Purge Control Solenoid Valve.](#)

3. CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE. 

Turn the ignition switch to OFF.

Are there holes, cracks, clogging, or disconnection, misconnection of hoses or pipes in evaporative emission control system?

Yes

Repair or replace the hoses or pipes.

No

Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of purge flow by the change of Evaporative Leak Check Module pressure sensor output value before/after purge introduction.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
(Evaporative Leak Check Module switching valve for time)	= Close
Purge control duty ratio	< 120s
Precondition (preconditions is to close the intrusive Evaporative Leak Check Module switching valve)	> 0%
Battery voltage value	≥ 10.9 V
Barometric pressure	≥ 75.1 kPa (563 mmHg, 22.2 inHg)
Integrated value of calculated purge airflow since engine start	≥ 72g (2.5 oz)*
Barometric pressure – Manifold absolute pressure	≥ 10 kPa (75 mmHg, 3 inHg)
((Fuel system status for time) followed by Fuel system status)	= Fuel cut
Ambient air temperature	≥ 1s
	≠ Fuel cut
	≥ -25°C (-13°F)

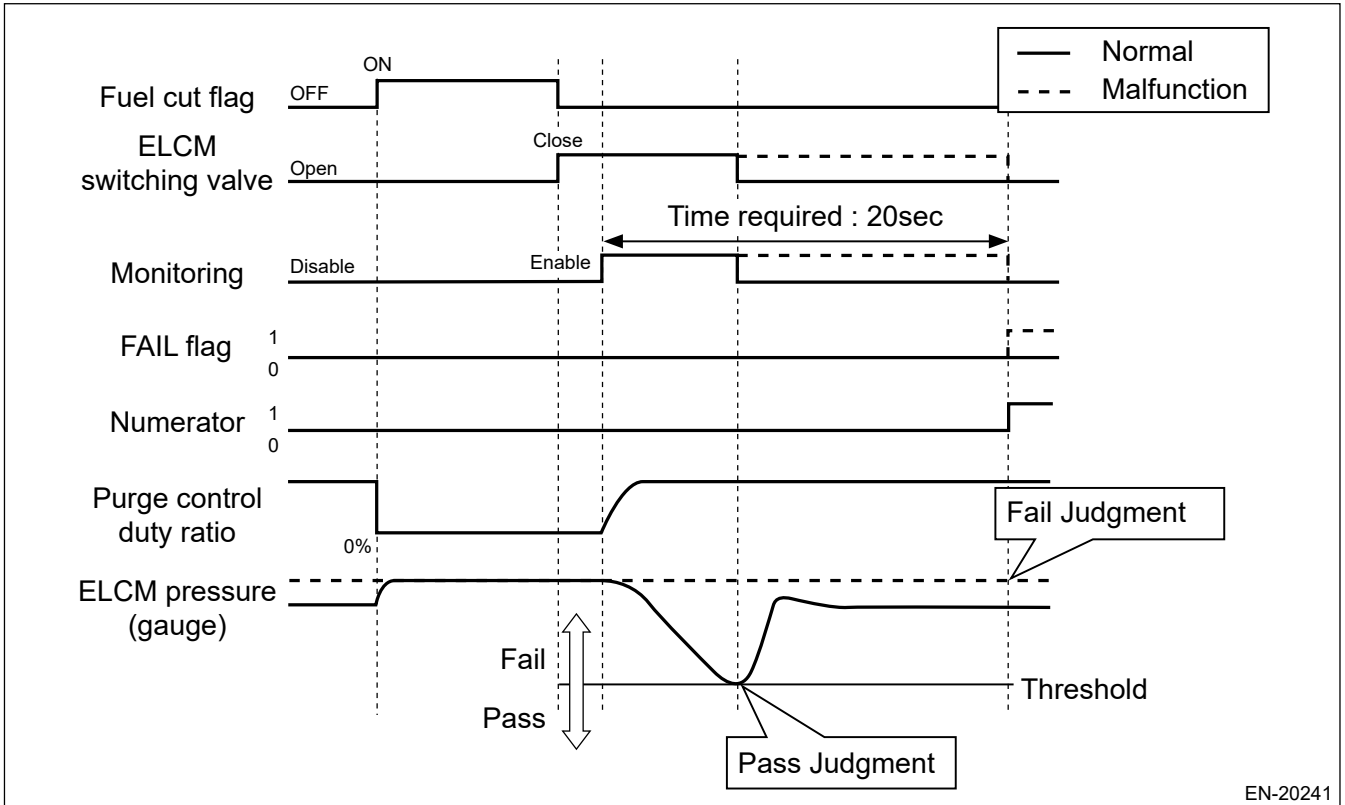
*It takes approximately 2 min at 40 MPH

3. GENERAL DRIVING CYCLE

Perform the diagnosis only once after engine start.

4. DIAGNOSTIC METHOD

If Evaporative Leak Check Module pressure (gauge) does not reach the threshold value within the time needed for diagnosis, judge as malfunction of purge flow.



EN-20241

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Evaporative Leak Check Module pressure (gauge)	> -668 Pa (-5 mmHg, -0.2 inHg)

Time needed for diagnosis: 20 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P0451 EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

1. CHECK FOR ANY OTHER DTC ON DISPLAY. 

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>List of Diagnostic Trouble Code (DTC).


No

 Go to 2.

2. CHECK CURRENT DATA. 

1. Turn the ignition switch to ON (engine OFF).
2. Using the Subaru Select Monitor or a general scan tool, read the values of [Evap System Vapor Pressure] and [Mani. Absolute Pressure] to compare with actual atmospheric pressure.

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Subaru Select Monitor.
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.
- **To read the actual atmospheric pressure, connect the Subaru Select Monitor or general scan tool to the other known good vehicle.**

Is the difference with the actual atmospheric pressure 6.2 kPa (46.5 mmHg, 1.8 inHg) or more?

Yes

Replace the part that showed larger deviation from the actual atmospheric pressure than the other.

- If deviations in value for [Evap System Vapor Pressure] is larger: Replace the leak check valve assembly. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly.](#)
- If deviations in value for [Mani. Absolute Pressure] is larger: Replace the manifold absolute pressure and intake air temperature sensor. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Manifold Absolute Pressure and Intake Air Temperature Sensor.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

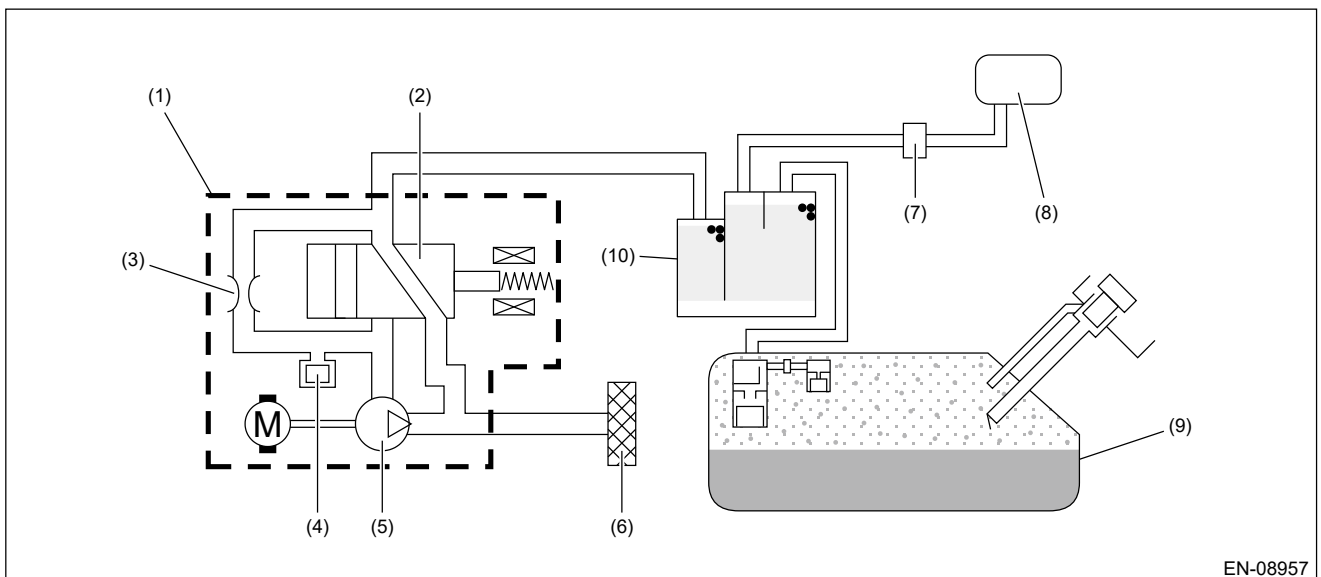
Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

1. OUTLINE OF DIAGNOSIS

Detect the output characteristics malfunction of Evaporative Leak Check Module pressure sensor. Judge as NG when the Evaporative Leak Check Module pressure sensor output value is largely different from the intake manifold pressure when the ignition switch is ON.

2. COMPONENT DESCRIPTION



- | | | |
|---|----------------------------------|---------------|
| (1) Leak check valve ASSY | (5) Vacuum pump | (9) Fuel tank |
| (2) Switching valve | (6) Drain filter | (10) Canister |
| (3) Reference orifice (0.02 inch orifice) | (7) Purge control solenoid valve | |
| (4) Pressure sensor | (8) Intake manifold | |

3. EXECUTION CONDITION

Secondary Parameters	Execution condition

Elapsed time after ignition switch is turned to ON	≥ 0.5 s and < 60 s
Soaking time	≥ 60 s
Evaporative Leak Check Module vacuum pump	Not in operation
Evaporative Leak Check Module switching valve	Open
Purge control	Not in operation

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Evaporative Leak Check Module pressure sensor output value when ignition switch is ON – intake manifold pressure (absolute pressure) when ignition switch is ON	> 12.4 kPa (93 mmHg, 3.7 inHg)

Time needed for diagnosis: 0.32 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0452 EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT LOW

DTC detecting condition:

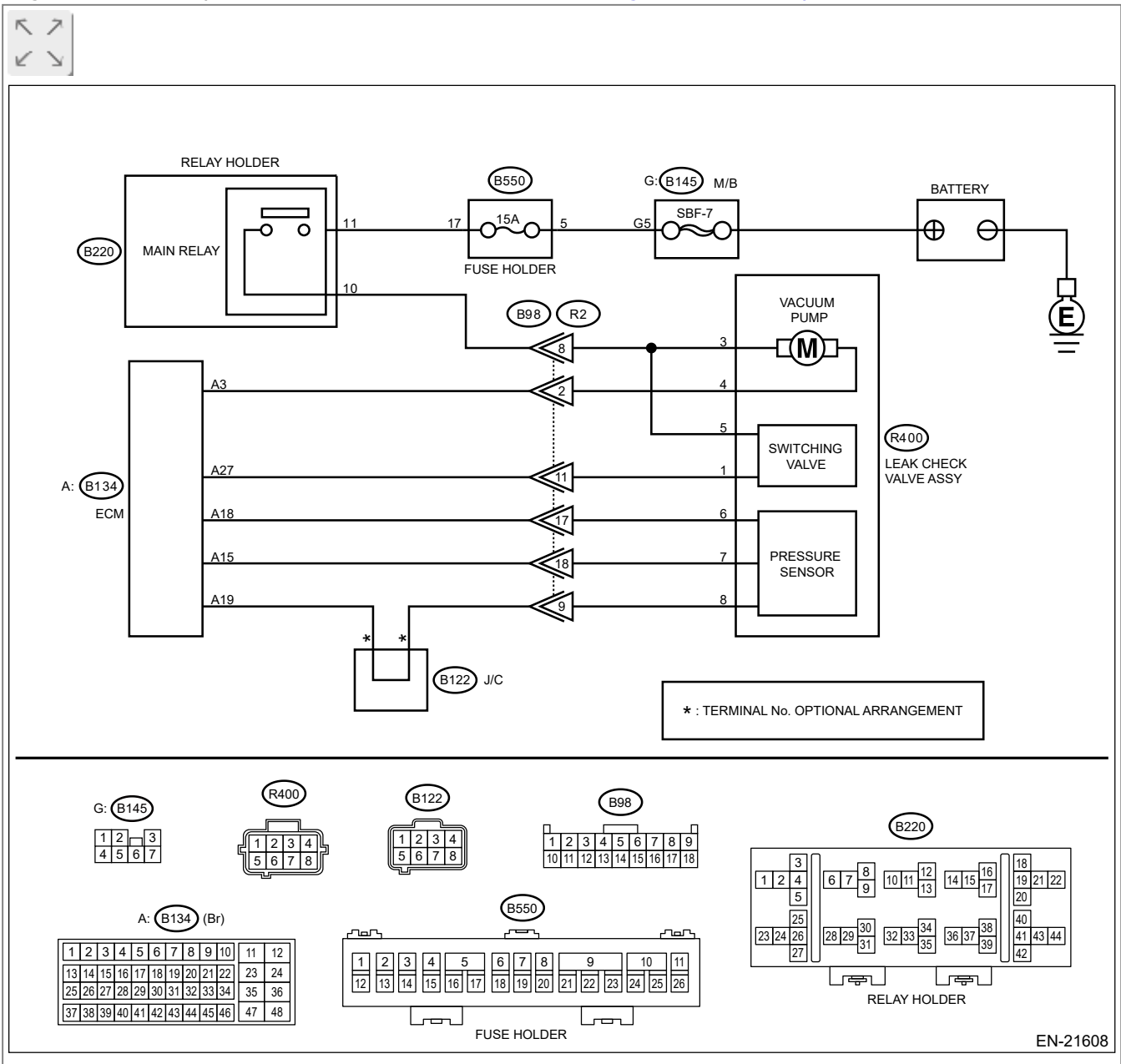
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK CURRENT DATA.



1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Evap System Vapor Pressure].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value in [Evap System Vapor Pressure] 34 kPa (255 mmHg, 10 inHg) or less?

Yes

[Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK POWER SUPPLY OF LEAK CHECK VALVE ASSEMBLY.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the leak check valve assembly.
3. Turn the ignition switch to ON.
4. Measure the voltage between the leak check valve assembly connector and chassis ground.

Connector & terminal

(R400) No. 6 (+) — Chassis ground (-):

Is the voltage 4.5 V or more?

Yes

[Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and the leak check valve assembly connector**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM and chassis ground.

Connector & terminal

(B134) No. 15 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 4.](#)

No

Repair the short circuit to ground in harness between ECM and leak check valve assembly connector.

4. CHECK FOR POOR CONTACT.




Check for poor contact of leak check valve assembly connector.

Is there poor contact in the leak check valve assembly connector?

Yes

Repair the poor contact in the leak check valve assembly connector.

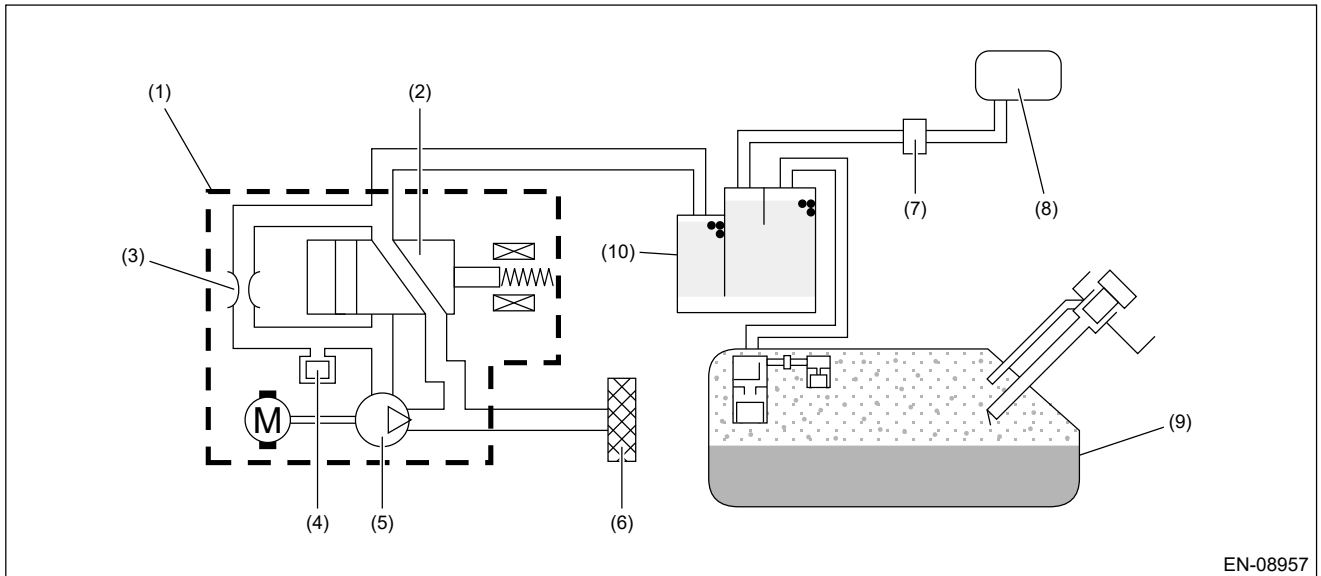
No

Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit in Evaporative Leak Check Module pressure sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-08957

- (1) Leak check valve ASSY
- (2) Switching valve
- (3) Reference orifice (0.02 inch orifice)
- (4) Pressure sensor
- (5) Vacuum pump
- (6) Drain filter
- (7) Purge control solenoid valve
- (8) Intake manifold
- (9) Fuel tank
- (10) Canister

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$< 0.92 \text{ V}$

Time needed for diagnosis: 1000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0453 EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT HIGH

DTC detecting condition:

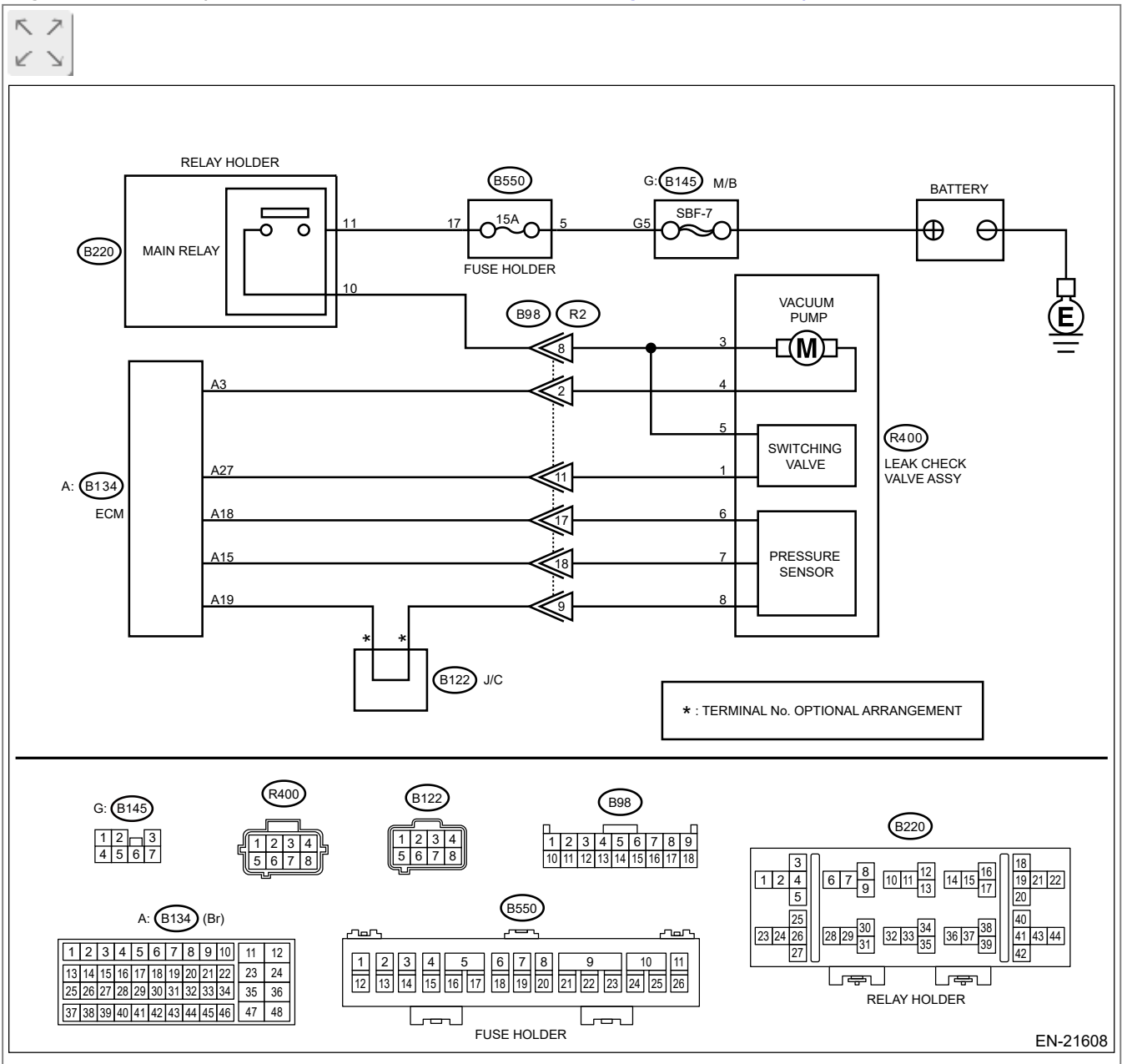
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK CURRENT DATA.



1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Evap System Vapor Pressure].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Evap System Vapor Pressure] 125 kPa (938 mmHg, 36.9 inHg) or more?

Yes

[Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the leak check valve assembly.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and the leak check valve assembly connector.

Connector & terminal

(B134) No. 15 — (R400) No. 7:

(B134) No. 19 — (R400) No. 8:

Is the resistance less than 1 Ω ?

Yes

[Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and the leak check valve assembly connector**

- **Poor contact of coupling connector**
- **Poor contact of joint connector**

3. CHECK FOR POOR CONTACT.

Check for poor contact of ECM and the leak check valve assembly connector.

Is there poor contact in ECM and the leak check valve assembly connector?


Yes

Repair the poor contact of ECM and the leak check valve assembly connector.

No

 [Go to 4.](#)

4. CHECK LEAK CHECK VALVE ASSEMBLY.


Check the pressure sensor of the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly>INSPECTION > CHECK PRESSURE SENSOR.](#)

Is the pressure sensor of the leak check valve assembly OK?

Yes

Repair the short circuit to power in harness between ECM and leak check valve assembly connector.

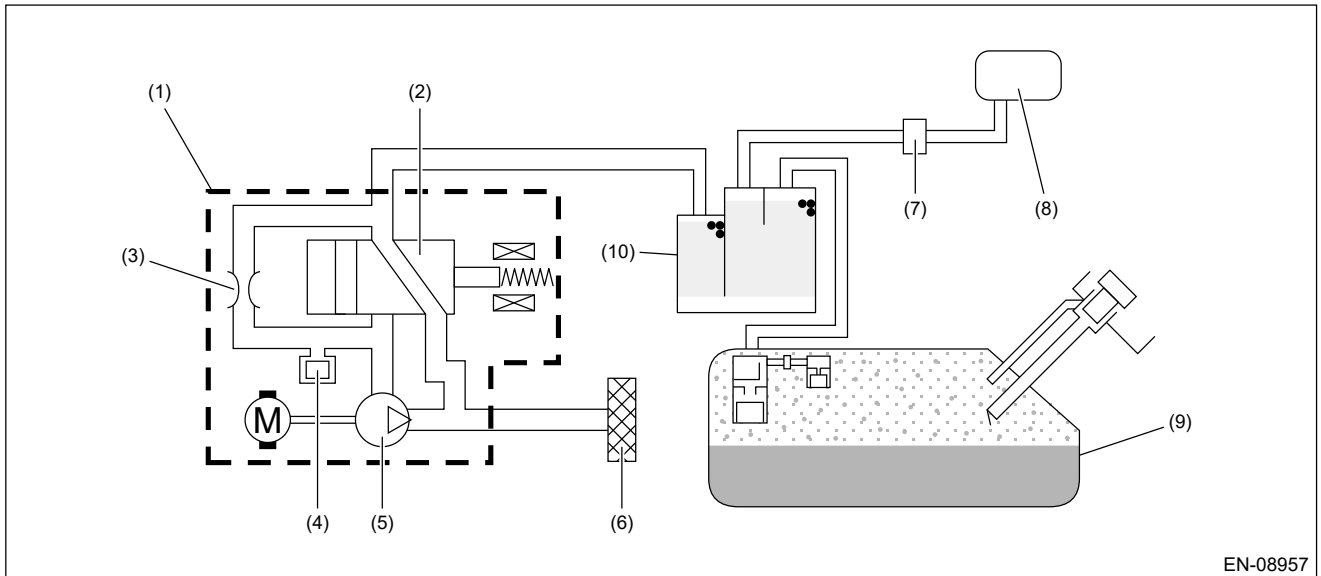
No

Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit in Evaporative Leak Check Module pressure sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



- (1) Leak check valve ASSY
- (2) Switching valve
- (3) Reference orifice (0.02 inch orifice)
- (4) Pressure sensor
- (5) Vacuum pump
- (6) Drain filter
- (7) Purge control solenoid valve
- (8) Intake manifold
- (9) Fuel tank
- (10) Canister

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$> 4.25 \text{ V}$

Time needed for diagnosis: 1000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0455 EVAP SYSTEM (CPC) LEAK DETECTED (LARGE LEAK)



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Fuel odor
- There is a hole of more than 1.0 mm (0.04 in) dia. in evaporation system or fuel tank.
- Fuel filler cap loose or lost

Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

1. CHECK FUEL FILLER CAP.

1. Turn the ignition switch to OFF.
2. Check the fuel filler cap.

Note:

The DTC is stored in memory if fuel filler cap is or was loose or if the cap chain has caught while tightening.

Is the fuel filler cap tightened securely?

 [Go to 2.](#)

Tighten fuel filler cap securely.

2. CHECK FUEL FILLER CAP.


Is the fuel filler cap genuine?

 [Go to 3.](#)

Replace with a genuine fuel filler cap.

3. CHECK FUEL FILLER PIPE GASKET.

Is there any damage to the seal between fuel filler cap and fuel filler pipe?

Repair or replace the fuel filler cap and fuel filler pipe.  [Ref. to FUEL INJECTION](#)

[\(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Filler Pipe.](#)

No

[Go to 4.](#)

4. CHECK PURGE CONTROL SOLENOID VALVE.



Check air-tightness of the purge control solenoid valve. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Purge Control Solenoid Valve>INSPECTION.](#)

Is the purge control solenoid valve OK?

Yes

[Go to 5.](#)

No

Replace the purge control solenoid valve. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Purge Control Solenoid Valve.](#)

5. CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE.



Are there holes on the evaporation line?

Yes

Repair or replace the evaporation line. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Delivery and Evaporation Lines.](#)

No

[Go to 6.](#)

6. CHECK CANISTER.



Are there holes on the canister?

Yes

Replace the canister. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Canister.](#)

No

[Go to 7.](#)

7. CHECK LEAK CHECK VALVE ASSEMBLY.




Are there damage or holes on the leak check valve assembly?

Yes

Replace the leak check valve assembly. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly.](#)

No


 [Go to 8.](#)

8. CHECK FUEL TANK.


Remove the fuel tank.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Tank.](#)

Are there damage or holes on the fuel tank?

Yes

Repair or replace the fuel tank.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Tank.](#)

No

 [Go to 9.](#)

9. CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM.

Are there holes, cracks, clogging, or disconnection, misconnection of hoses or pipes in evaporative emission control system?

Yes

Repair or replace the hoses or pipes.

No

Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

This diagnosis judges whether the Evaporative Leak Check Module operation is normal or not, and whether the evaporative emission system has leak and clogging or not.

To purge the canister, after driving, perform the five hours soaking after ignition switch OFF in order to stabilize the evaporative gas status. * After 5 or 7 or 9.5 hours passed, ECM is activated by soaking timer, and the leak check is started.

Judges whether the Evaporative Leak Check Module operation is normal or not, by measuring the reference pressure status via reference orifice (0.02 inch orifice). Judge as malfunction if the reference pressure is out of specified range. Then, judge whether there is a leak or not, by comparing the pressure (leak pressure) when the reference pressure and the evaporative emission system are in negative pressure condition. Judge as system leak in the evaporative emission system if the leak pressure is higher than reference pressure. Judge as clogging of pipe if the leak pressure becomes lower than the reference pressure within the specified amount of time.

0.02 inch leak and 0.04 inch leak can be distinguished by measuring the leak pressure.

The diagnosis results are stored inside ECM until the engine is started again.

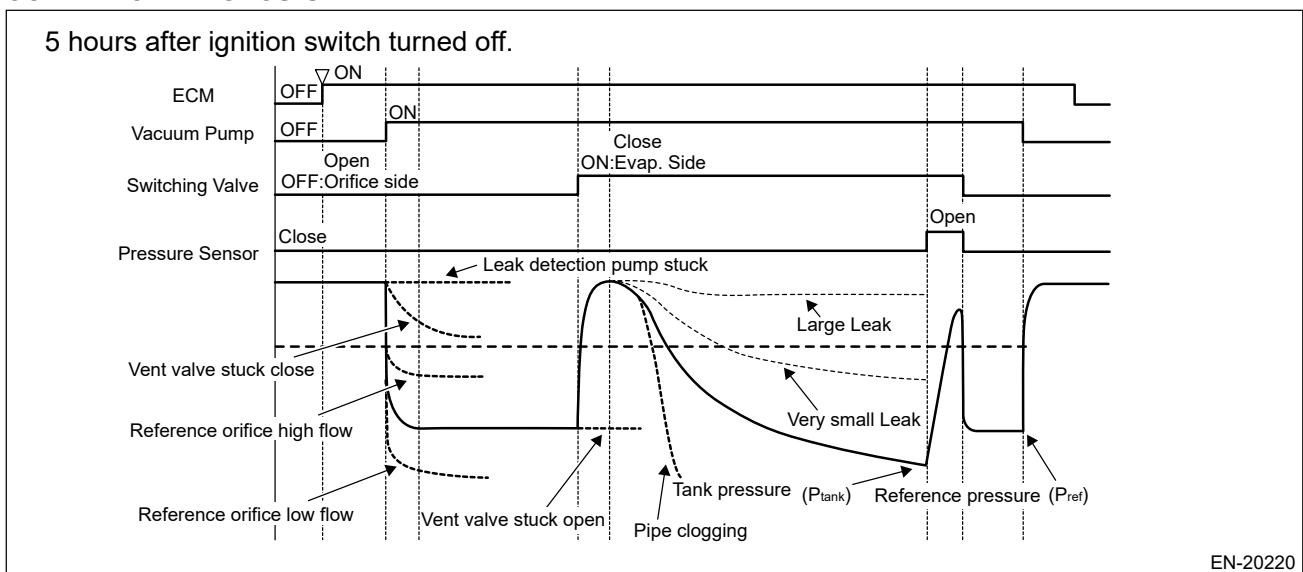
*: When the test conditions are not met in 5 hours, perform diagnosis at elapsed time of 7 hours.

When the test conditions are not met in 7 hours, perform diagnosis at elapsed time of 9.5 hours.

Diagnostic item	
Evaporative Leak Check Module	Vacuum pump stuck

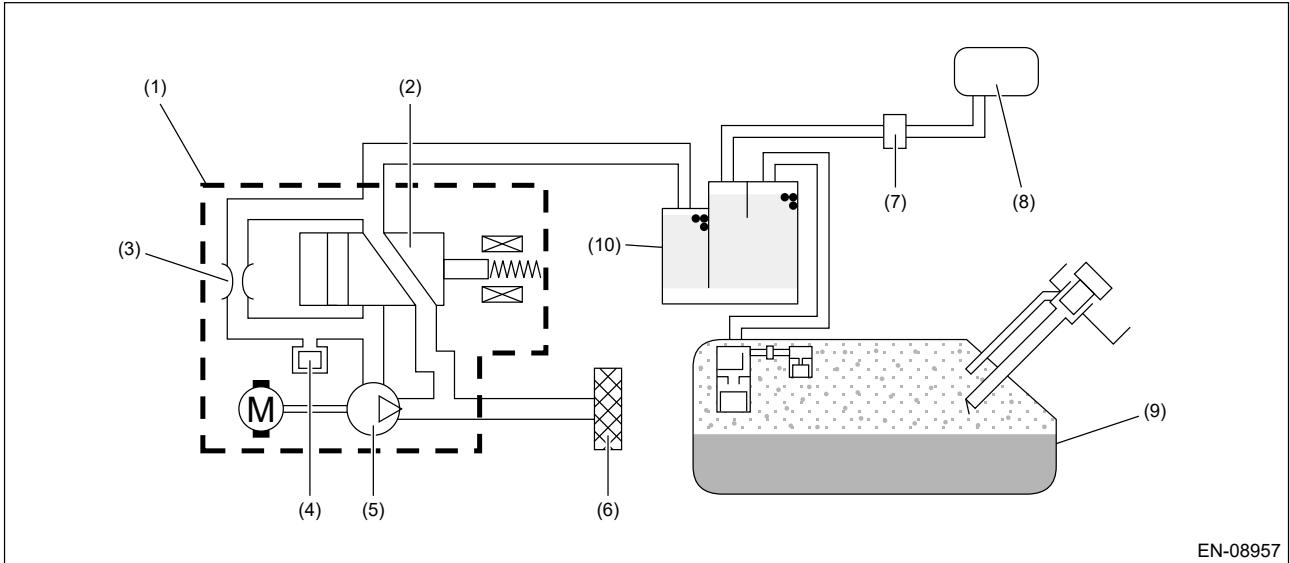
system (leak check valve assembly main body)	Switching valve stuck to open Switching valve stuck to close Reference orifice flow large Reference orifice flow small
Leak check	Large leak <ul style="list-style-type: none"> • 0.04 inch leak • Fuel cap loose • Fuel cap off • System malfunction
	Very small leak <ul style="list-style-type: none"> • 0.02 inch leak
Clogging of pipe	—

OUTLINE OF DIAGNOSIS



2. COMPONENT DESCRIPTION

Leak check valve assembly consists of the pressure sensor, the reference orifice (diameter of 0.02 inch), the vacuum pump which introduces the negative pressure into evaporative emission system, and the switching valve which switches the passage to introduce the negative pressure.



EN-08957

- (1) Leak check valve ASSY
- (2) Switching valve
- (3) Reference orifice (0.02 inch orifice)
- (4) Pressure sensor
- (5) Vacuum pump
- (6) Drain filter
- (7) Purge control solenoid valve
- (8) Intake manifold
- (9) Fuel tank
- (10) Canister

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Activation of soaking timer	Completed
Battery voltage	$\geq 10.9 \text{ V}$
Engine coolant temperature	$\geq 4.4^\circ\text{C}$ (39.9°F) and $< 45^\circ\text{C}$ (113°F)
Barometric pressure	$\geq 75 \text{ kPa}$ (563 mmHg , 22.2 inHg)
Accumulated purge amount during previous driving cycle	$\geq \text{Value of Map 1}$

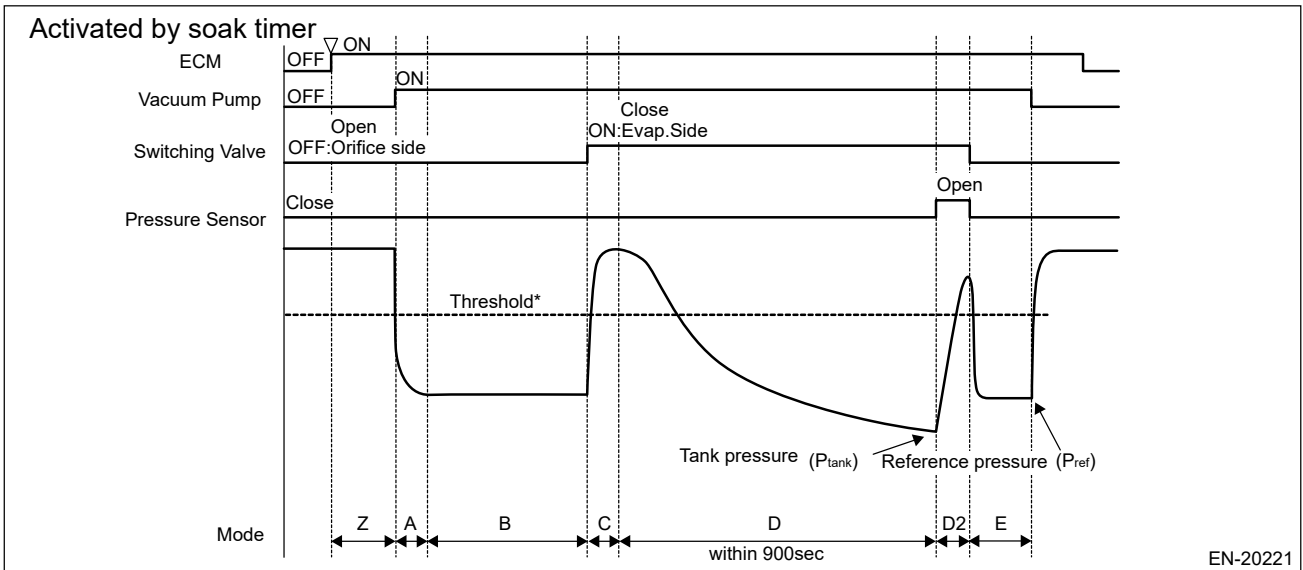
Map 1

Engine coolant temperature $^\circ\text{C}$ ($^\circ\text{F}$)	0 (32)	30 (86)	35 (95)	40 (104)	45 (113)
Accumulated purge amount during previous driving cycle g (oz)	97 (105.8 1)	97 (105.8 1)	259 (282.16)	420 (458. 51)	582 (634.86)

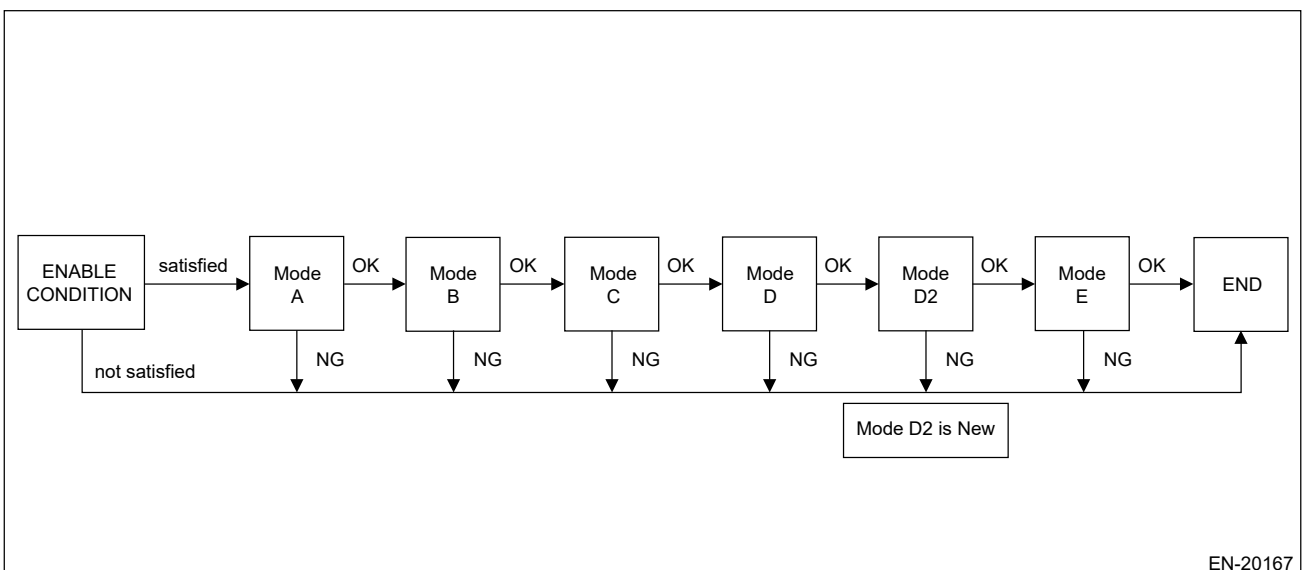
4. GENERAL DRIVING CYCLE

Perform the diagnosis only once when 5 or 7 or 9.5 hours has passed after ignition switch is OFF. For more detail, refer to "OUTLINE OF DIAGNOSIS".

5. DIAGNOSTIC METHOD



Mode	Explanation of Mode	Diagnosis Period
A	Vacuum pump operation confirmation and characteristics stability	7 s or less
B	Measurement of reference pressure for setting the target negative pressure	350 s or less
C	Switching valve operation confirmation	12 s or less
D	Clogging of pipe diagnosis and leak pressure measurement	900 s or less
D2	High pressure purge line pipe clogging	60 s or less
E	Reference pressure measurement for judgment	50 s or less
Z	Measurement of atmospheric pressure	70 s or less



MODE A (VACUUM PUMP OPERATION CONFIRMATION AND CHARACTERISTICS STABILITY)

Purpose: Detect the vacuum pump operation trouble.

Judge as NG when the following conditions are established.

Judge as OK if the following conditions are not established, and warm up for five minutes to stabilize the vacuum pump characteristics.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Pressure sensor output value	> -224 Pa (-1.7 mmHg, -0.1 inHg)	P2404

MODE B (MEASUREMENT OF REFERENCE PRESSURE FOR SETTING THE TARGET NEGATIVE PRESSURE)

Judgment 1

Purpose: Judge the reference pressure stability.

Judge as NG when the following conditions are established.

Judgment 2

Purpose: Judge whether the reference pressure is within the normal range, and detect the vacuum pump and orifice malfunctions.

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Judgment 1 Pressure sensor maximum output value – Pressure sensor minimum output value or Judgment 2	> 493 Pa (3.7 mmHg, 0.1 inHg)	P2404
Reference pressure for setting the target negative pressure	< Value of Map 2 or > Value of Map 3	P2404

Map 2

Barometric pressure kPa (mmHg, inHg)	70 (525, 20.7)	80 (600, 23.6)	90 (675, 26.6)	100 (750, 29.5)
Reference pressure for setting the target negative pressure Pa (mmHg, inHg)	-3972 (-29.8, -1.2)	-4079 (-30.6, -1.2)	-4186 (-31.4, -1.2)	-4292 (-32.2, -1.3)

Map 3

Barometric pressure kPa (mmHg, inHg)	70 (525, 20.7)	80 (600, 23.6)	90 (675, 26.6)	100 (750, 29.5)
Reference pressure for setting the target negative pressure Pa (mmHg, inHg)	-942 (-7.1, -0.3)	-1048 (-7.9, -0.3)	-1155 (-8.7, -0.3)	-1262 (-9.5, -0.4)

MODE C (SWITCHING VALVE OPERATION CONFIRMATION)

Purpose: Measure the pressure increase when switching valve is changed from open to close, and detect the stuck to open/close malfunctions of the switching valve.

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Pressure sensor output value – Reference pressure for setting the target negative pressure	< 224 Pa (1.7 mmHg, 0.1 inHg)	P2404

MODE D (CLOGGING OF PIPE DIAGNOSIS AND LEAK PRESSURE MEASUREMENT)

1. Clogging of pipe

Purpose: Measure the time required for the evaporative emission system to reach the target negative pressure by the vacuum pump, and detect the clogging of pipe trouble.

Judge as clogging of pipe malfunction if the evaporative emission system reaches to the target negative pressure within the specified time.

2. Leak pressure measurement

Purpose: Measure the pressure (leak pressure) when the evaporative emission system becomes the negative pressure by the vacuum pump.

Store the pressure as a leak pressure while the following conditions are met.

Judgment value

Malfunction Criteria	Threshold Value	DTC
<Pase D> Time of Pase D	≤ 30 s	P1451
<Pase D2> Reference pressure for judgment of the target negative pressure	< -667 kPa (-37.298 mmHg, -1.5 inHg)	P04AF
<Large leak (0.04 inch)> Leak pressure	≥ Map 4	P0455
<Very small leak (0.02 inch)> Leak pressure	> 0.018 inch reference pressure (Pa) and < Map 4	P0456

Formula for threshold value = Reference pressure × 0.377 - 0.341

Map 4

Reference pressure for judgment (Pa)	-4856	-4000	-2750	-1500	-824
Threshold Value (Pa)	-1785	-1463	-991	-520	-265

MODE E (MEASUREMENT OF REFERENCE PRESSURE FOR JUDGMENT)

Judgment 1

Purpose: Judge the reference pressure stability.

Judge as NG when the following conditions are established.

Judgment 2

Purpose: Judge whether the reference pressure is within the normal range, and detect the vacuum pump and orifice malfunctions. Judge the vacuum pump performance stability.

Judge as NG when the following conditions are established.

Judgment 3

Purpose: Judge the presence of evaporative emission system leak.

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Judgment 1 Pressure sensor maximum output value – Pressure sensor minimum output value or Judgment 2 Reference pressure for judgment or Judgment 3 Reference pressure for setting the target negative pressure – Reference pressure for judgment	> 493 Pa (3.7 mmHg, 0.1 inHg) < Value of Map 5 or > Value of Map 6 > 943 Pa (7 mmHg, 2.77 inHg)	P2404 P2404 P2404

Map 5

Barometric pressure kPa (mmHg, inHg)	70 (525, 20.7)	80 (600, 23.6)	90 (675, 26.6)	100 (750, 29.5)
Reference pressure for judgment Pa (mmHg, inHg)	-4536 (-34, -1.33)	-4642 (-34.8, -1.37)	-4749 (-35.6, -1.4)	-4856 (-36.4, -1.43)

Map 6

Barometric pressure kPa (mmHg, inHg)	70 (525, 20.7)	80 (600, 23.6)	90 (675, 26.6)	100 (750, 29.5)
Reference pressure for judgment Pa (mmHg, inHg)	-824 (-6.1, -0.24)	-931 (-6.9, -0.27)	-1038 (-7.7, -0.3)	-1144 (-8.5, -0.33)

Time needed for diagnosis: 24 min


At next engine start, confirm whether the enable conditions are satisfied even though refueling has been done during soaking, and determine the malfunction.

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P0456 EVAP SYSTEM (CPC) LEAK DETECTED (VERY SMALL LEAK)

Note:

For the diagnostic procedure, refer to DTC P0455.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0455 EVAP SYSTEM \(CPC\) LEAK DETECTED \(LARGE LEAK\).](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0455.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0455 EVAP SYSTEM \(CPC\) LEAK DETECTED \(LARGE LEAK\).](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0458 EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT LOW



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

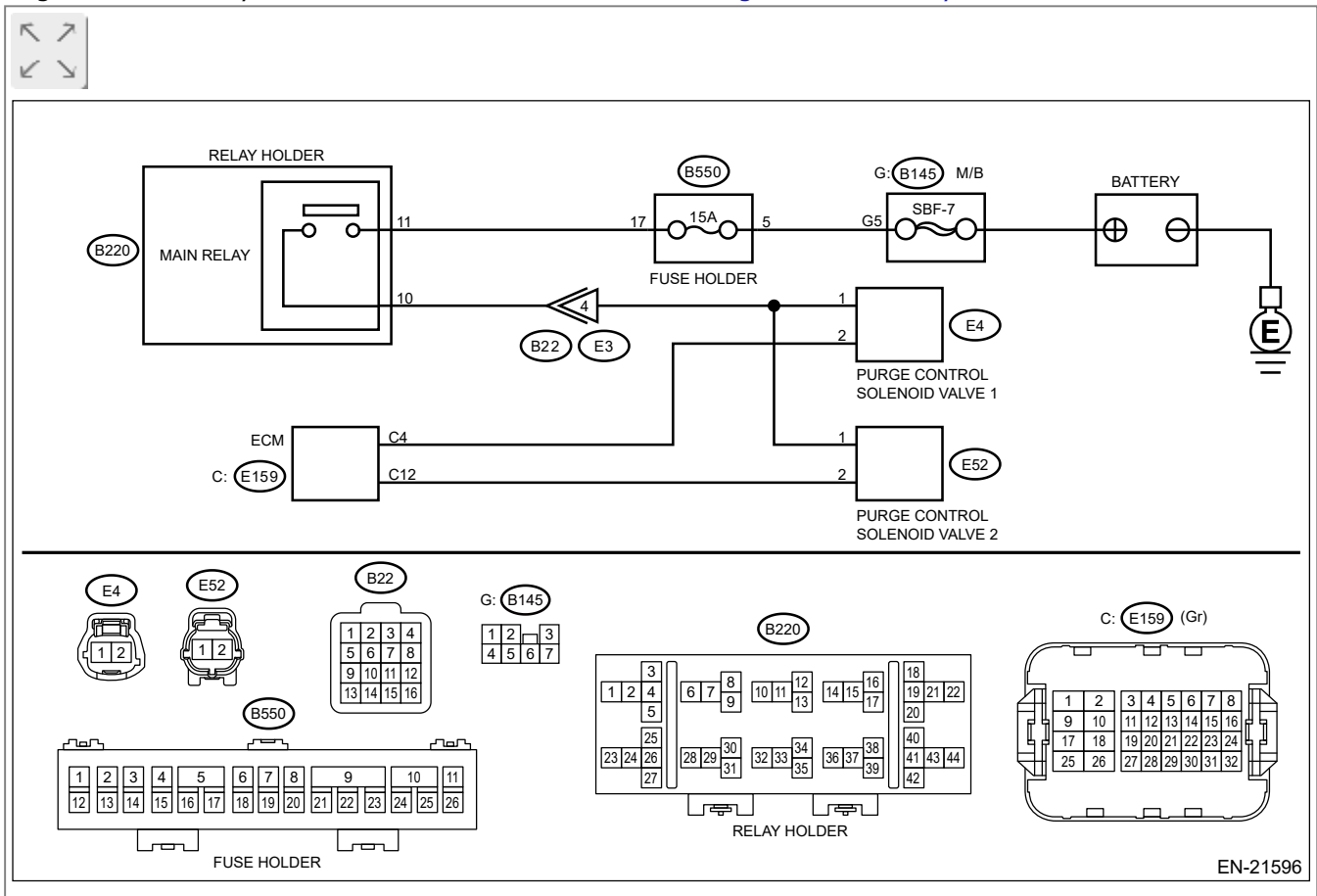
Improper idling

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK OUTPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and engine ground.

Connector & terminal

(E159) No. 4 (+) – Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

 [Go to 3.](#)

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes

Repair the poor contact of ECM connector.

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

3. CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE 1 CONNECTOR.

Measure the voltage between purge control solenoid valve 1 connector and engine ground.

Connector & terminal

(E4) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

Repair the power supply circuit.

4. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE 1 CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from purge control solenoid valve 1.
3. Disconnect the connector from ECM.
4. Measure the resistance between the purge control solenoid valve 1 connector and engine ground.

Connector & terminal

(E4) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the ground short circuit of harness between ECM and purge control solenoid valve 1 connector.

5. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE 1 CONNECTOR.



Measure the resistance of harness between ECM and purge control solenoid valve 1 connector.

Connector & terminal

(E159) No. 4 — (E4) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 6.](#)

No

Repair the open circuit in harness between ECM and purge control solenoid valve 1 connector.

6. CHECK PURGE CONTROL SOLENOID VALVE 1.



1. Remove the purge control solenoid valve 1.
2. Measure the resistance between purge control solenoid valve 1 terminals.

Terminals


No. 1 — No. 2:

Is the resistance 10 — 100 Ω ?

Yes

Repair the poor contact of the purge control solenoid valve 1 connector.

No

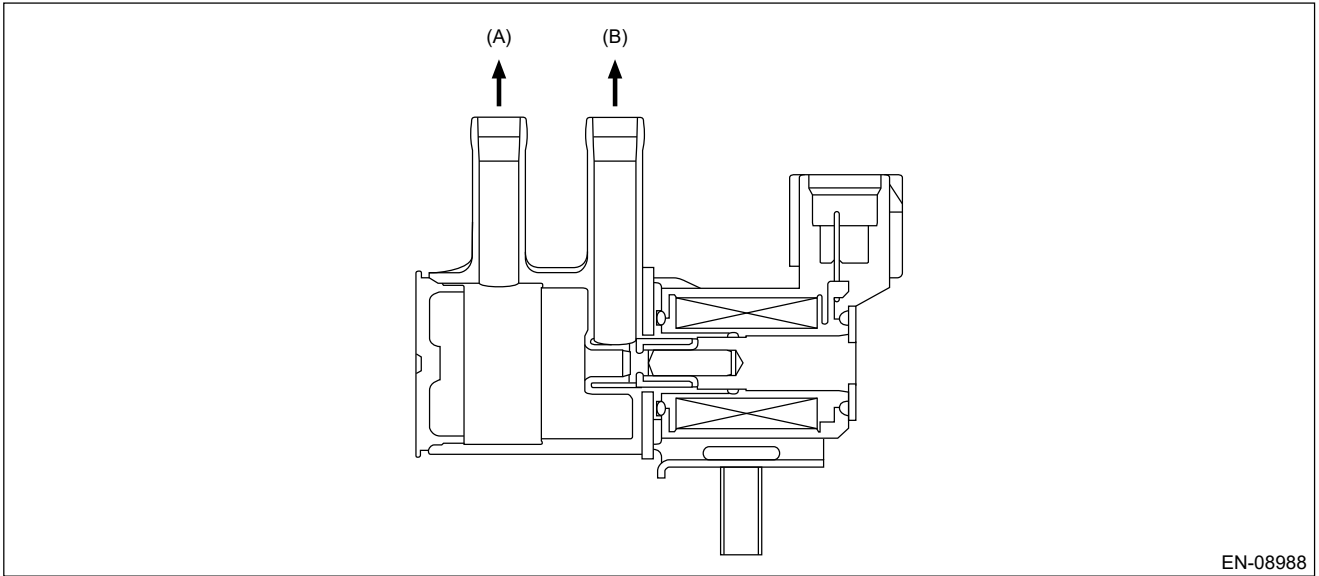
Replace the purge control solenoid valve 1.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Purge Control Solenoid Valve.](#)

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of the purge control solenoid valve.

Judge as NG when the ECM output level differs from the actual terminal level.

2. COMPONENT DESCRIPTION



(A) To canister

(B) To intake manifold

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Purge control solenoid valve control duty	$\leq 80\%$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis after starting the engine.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$\leq 2.2 \text{ V}$

Time needed for diagnosis: 2500 ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0459 EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT HIGH



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

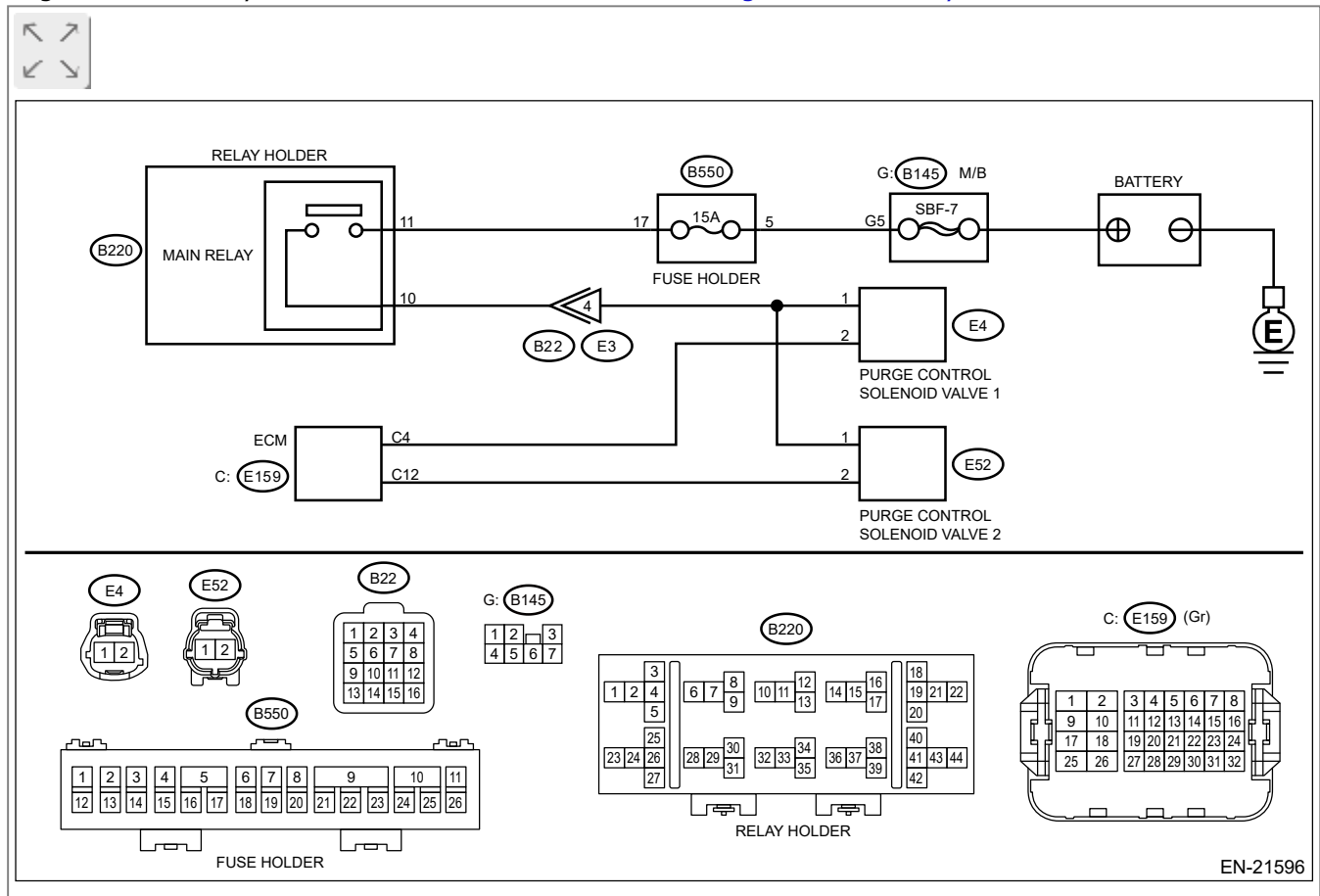
Improper idling

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE 1 CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from purge control solenoid valve 1.
3. Disconnect the connector from ECM.

4. Turn the ignition switch to ON.
5. Measure the voltage between ECM and engine ground.

Connector & terminal


(E159) No. 4 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

Repair the short to power in the harness between ECM and purge control solenoid valve 1 connector.

No

 [Go to 2.](#)

2. CHECK PURGE CONTROL SOLENOID VALVE 1.




1. Turn the ignition switch to OFF.
2. Measure the resistance between purge control solenoid valve 1 terminals.

Terminals

No. 1 — No. 2:

Is the resistance less than 1 Ω ?

Yes

Replace the purge control solenoid valve 1.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Purge Control Solenoid Valve.](#)

No

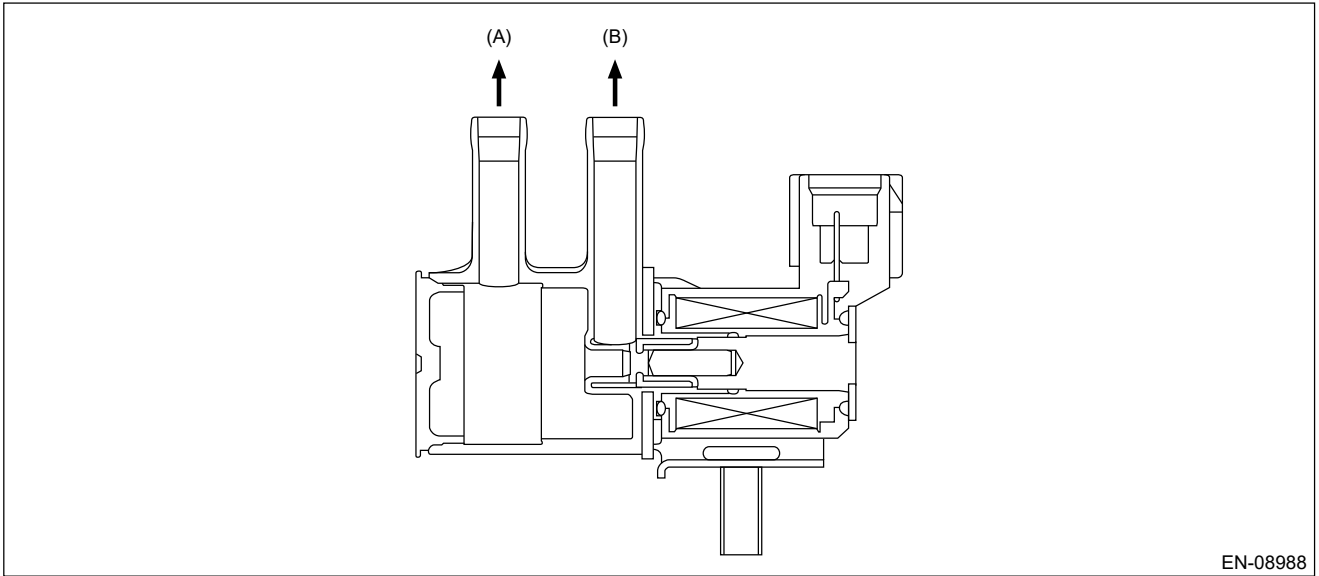
Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of the purge control solenoid valve.

Judge as NG when the ECM output level differs from the actual terminal level.

2. COMPONENT DESCRIPTION



(A) To canister

(B) To intake manifold

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Purge control solenoid valve control duty	$\geq 20\%$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis after starting the engine.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output current	$\geq 5\text{A}$

Time needed for diagnosis: 2250 ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0461 FUEL LEVEL SENSOR "A" CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..



1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

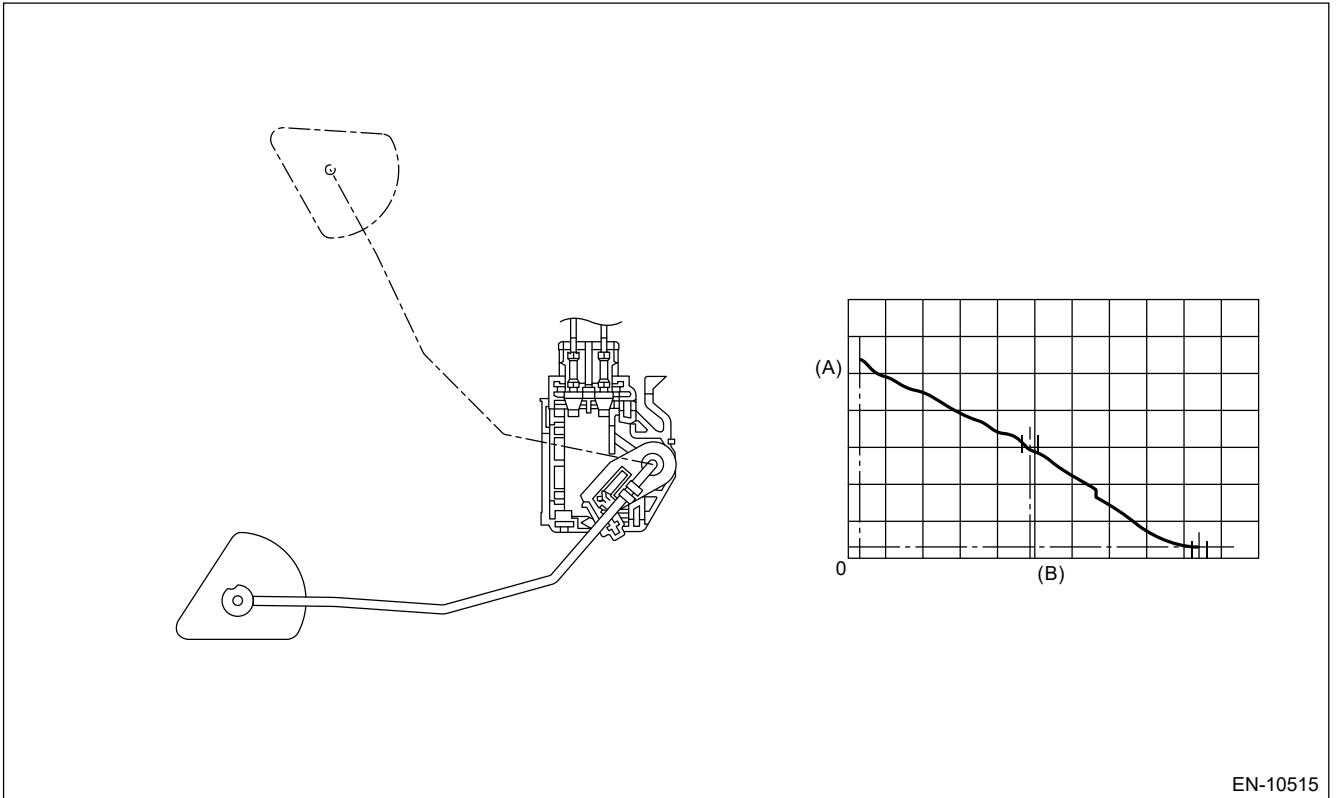
Replace the fuel level sensor and fuel sub level sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Level Sensor.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Sub Level Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect malfunctions of the fuel level sensor output property.

If the fuel level does not vary in a particular driving condition / engine condition where it should, judge as NG.

2. COMPONENT DESCRIPTION



EN-10515

(A) Fuel level

(B) Resistance

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Elapsed time after engine starting	$\geq 5 \text{ s}$
Fuel injection time sum value	$\geq 1148.2 \text{ s}$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Max. value – min. value of fuel level	$< 3.646\%$


Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0462 FUEL LEVEL SENSOR "A" CIRCUIT LOW

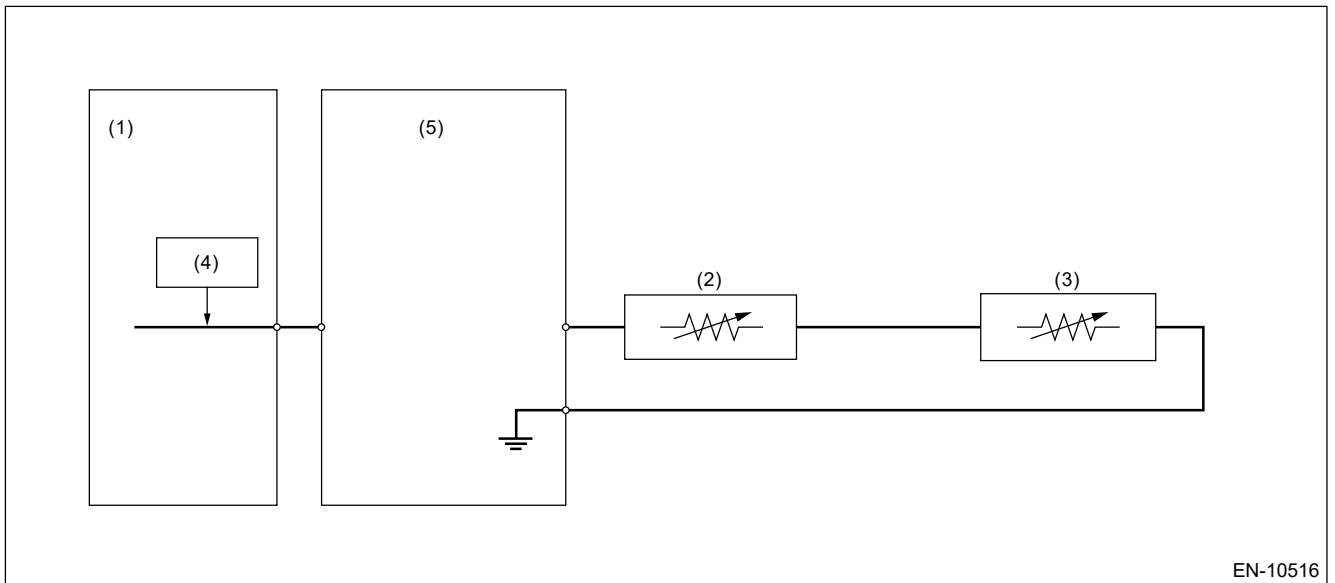
Note:

For the diagnostic procedure, refer to DTC P0463.  Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0463 FUEL LEVEL SENSOR "A" CIRCUIT HIGH.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of fuel level sensor. Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



- (1) Engine control module (ECM) (3) Fuel sub level sensor (5) Combination meter
(2) Fuel level sensor (4) Detecting circuit

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Elapsed time after starting the engine	≥ 3000 ms

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	< 2.21 V

Time needed for diagnosis: 2560 ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0463 FUEL LEVEL SENSOR "A" CIRCUIT HIGH

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is DTC P0462 or P0463 displayed on the Subaru Select Monitor?

Yes

Perform the diagnosis from step 2 in DTC B1500 of the combination meter.  Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1500 FUEL SENDER OPEN DETECTED.

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

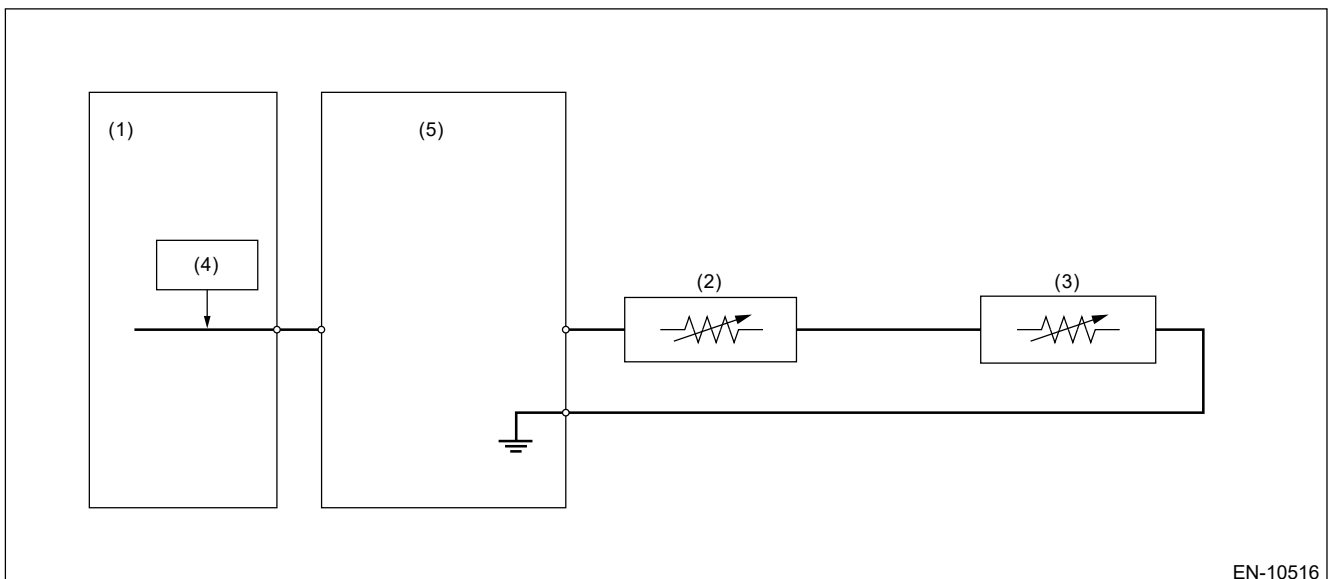
Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of fuel level sensor. Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



- (1) Engine control module (ECM)
- (2) Fuel sub level sensor
- (3) Fuel level sensor
- (4) Detecting circuit
- (5) Combination meter

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9\text{ V}$
Elapsed time after starting the engine	$\geq 3000\text{ ms}$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$> 12\text{ V}$

Time needed for diagnosis: 1040 ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P04AC EVAP SYSTEM (CPC) PURGE CONTROL VALVE "B" CIRCUIT LOW

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

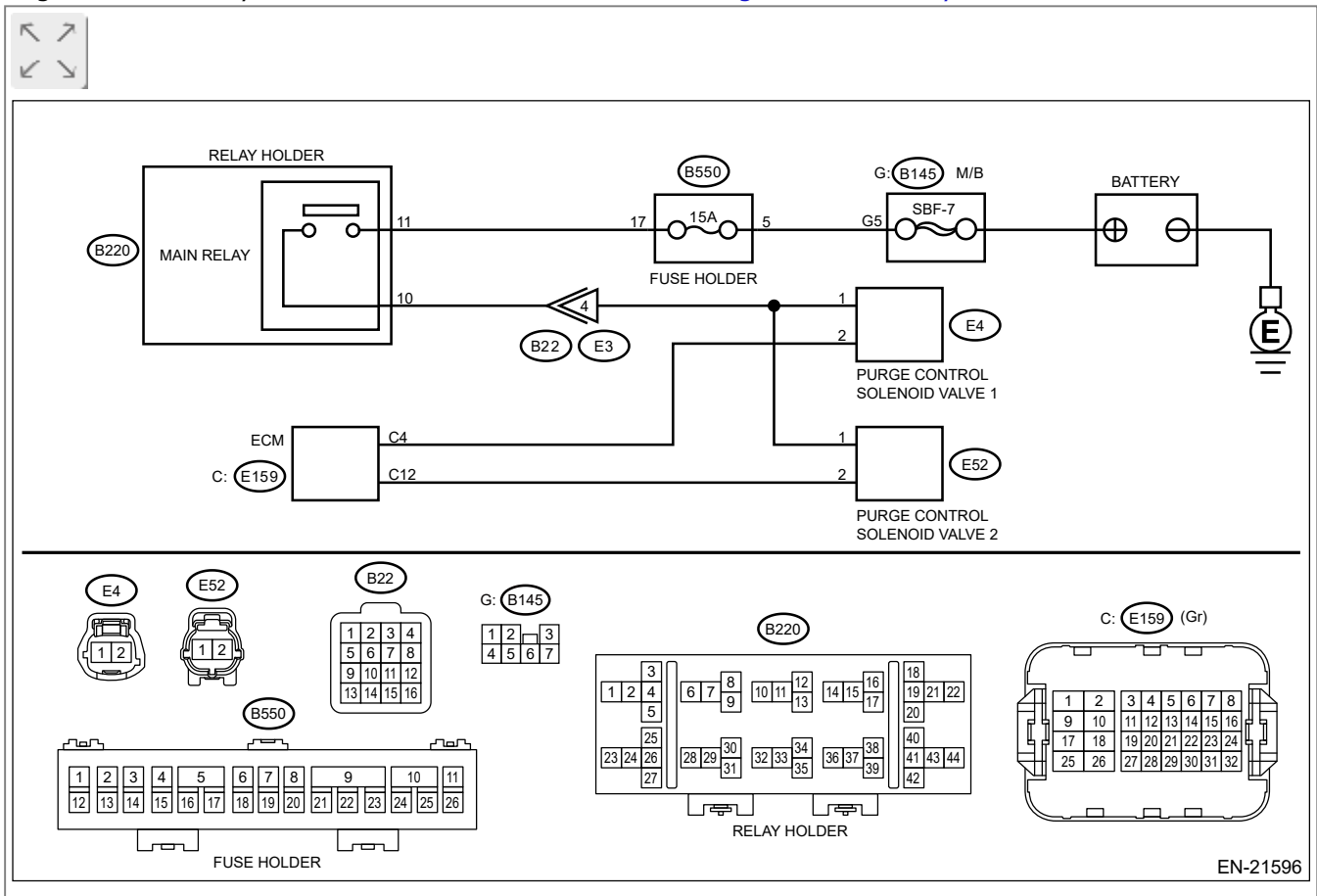
Improper idling

Caution:

- After servicing or replacing faulty parts, perform Clear Memory Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



EN-21596

1. CHECK OUTPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and engine ground.

Connector & terminal

(E159) No. 12 (+) — Engine ground (-):



Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

 [Go to 3.](#)

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes

Repair the poor contact of ECM connector.

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

3. CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE 2.

Measure the voltage between purge control solenoid valve 2 connector and engine ground.

Connector & terminal

(E52) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

Repair the power supply circuit.

4. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE 2 CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from purge control solenoid valve 2.
3. Disconnect the connector from ECM.
4. Measure the resistance between the purge control solenoid valve 2 connector and engine ground.

Connector & terminal

(E52) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the ground short circuit of harness between ECM and purge control solenoid valve 2 connector.

5. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE 2 CONNECTOR.



Measure the resistance of harness between ECM and purge control solenoid valve 2 connector.

Connector & terminal

(E159) No. 12 — (E52) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 6.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- Open circuit of harness between ECM and purge control solenoid valve 2 connector
- Poor contact of coupling connector

6. CHECK PURGE CONTROL SOLENOID VALVE 2.



1. Remove the purge control solenoid valve 2.
2. Measure the resistance between purge control solenoid valve 2 terminals.

Terminals


No. 1 — No. 2:

Is the resistance 10 — 100 Ω ?

Yes

Repair the poor contact of the purge control solenoid valve 2 connector.

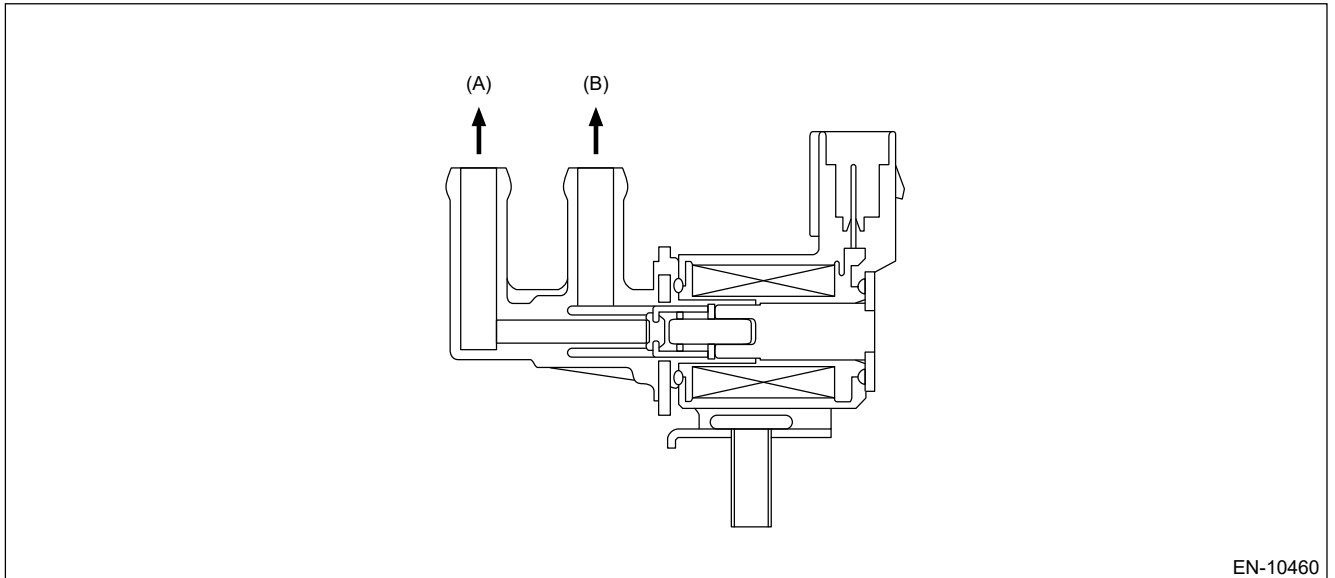
No

Replace the purge control solenoid valve 2.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Purge Control Solenoid Valve.](#)

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of the purge control solenoid valve 2.
 Judge as NG when the ECM output level differs from the actual terminal level.

2. COMPONENT DESCRIPTION



(A) To canister

(B) Intake manifold

EN-10460

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
ECM (Powered-on by Sub CPU)	ON
12 V battery system voltage	$\geq 10.9 \text{ V}$
Solenoid Valve 2 for purge control signal	= OFF

4. GENERAL DRIVING CYCLE

Always perform the diagnosis after starting the engine.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$\leq 2.2 \text{ V}$

Time needed for diagnosis: 2500 ms

Malfunction Indicator Light: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P04AD EVAP SYSTEM (CPC) PURGE CONTROL VALVE "B" CIRCUIT HIGH



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

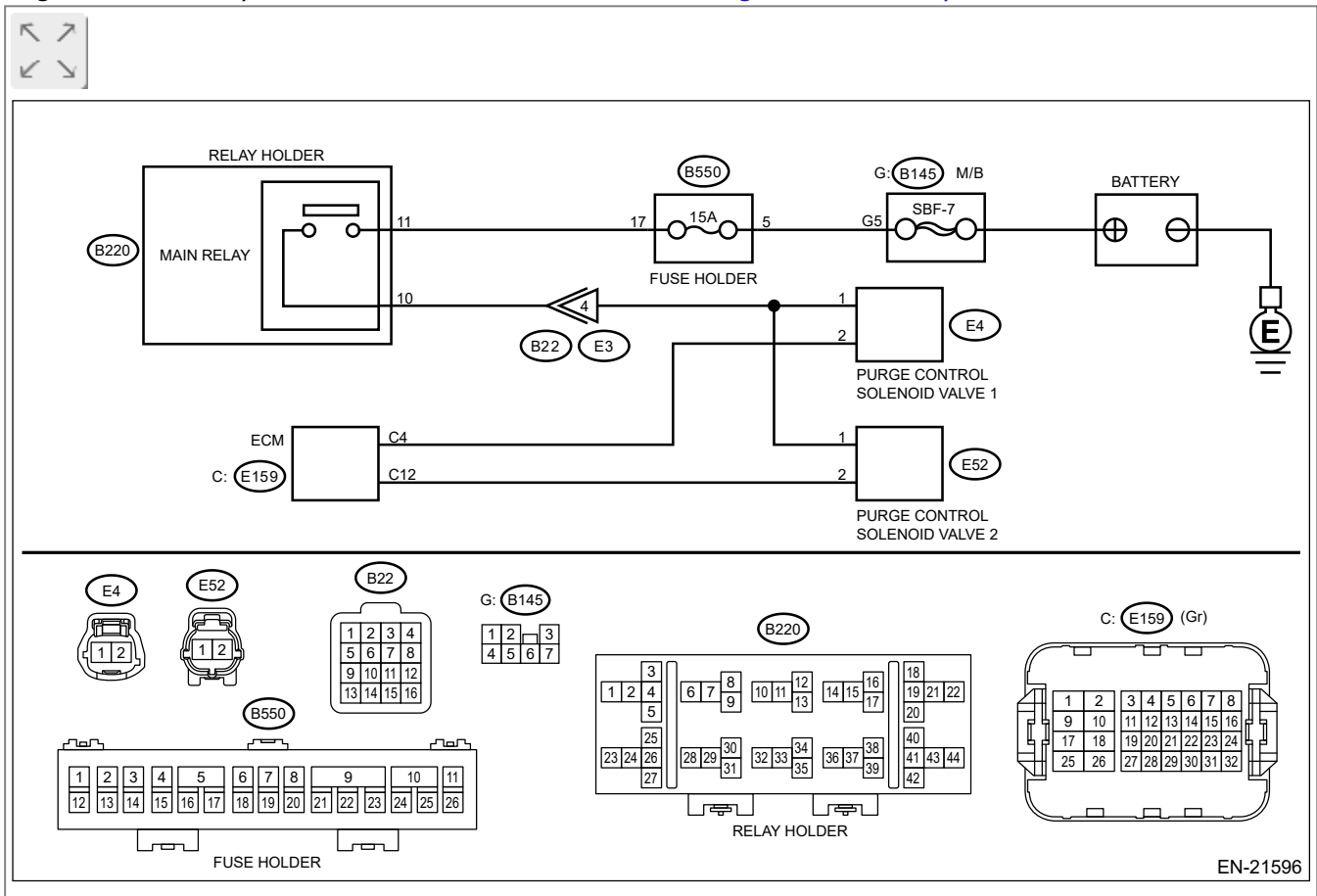
Improper idling

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE 2 CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from purge control solenoid valve 2.
3. Disconnect the connector from ECM.

4. Turn the ignition switch to ON.
5. Measure the voltage between ECM and engine ground.

Connector & terminal

(E159) No. 12 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

Repair the short to power in the harness between ECM and purge control solenoid valve 2 connector.

No

 [Go to 2.](#)

2. CHECK PURGE CONTROL SOLENOID VALVE 2.


1. Turn the ignition switch to OFF.
2. Measure the resistance between purge control solenoid valve 2 terminals.

Terminals

No. 1 — No. 2:

Is the resistance less than 1 Ω ?

Yes

Replace the purge control solenoid valve 2.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Purge Control Solenoid Valve.](#)

No

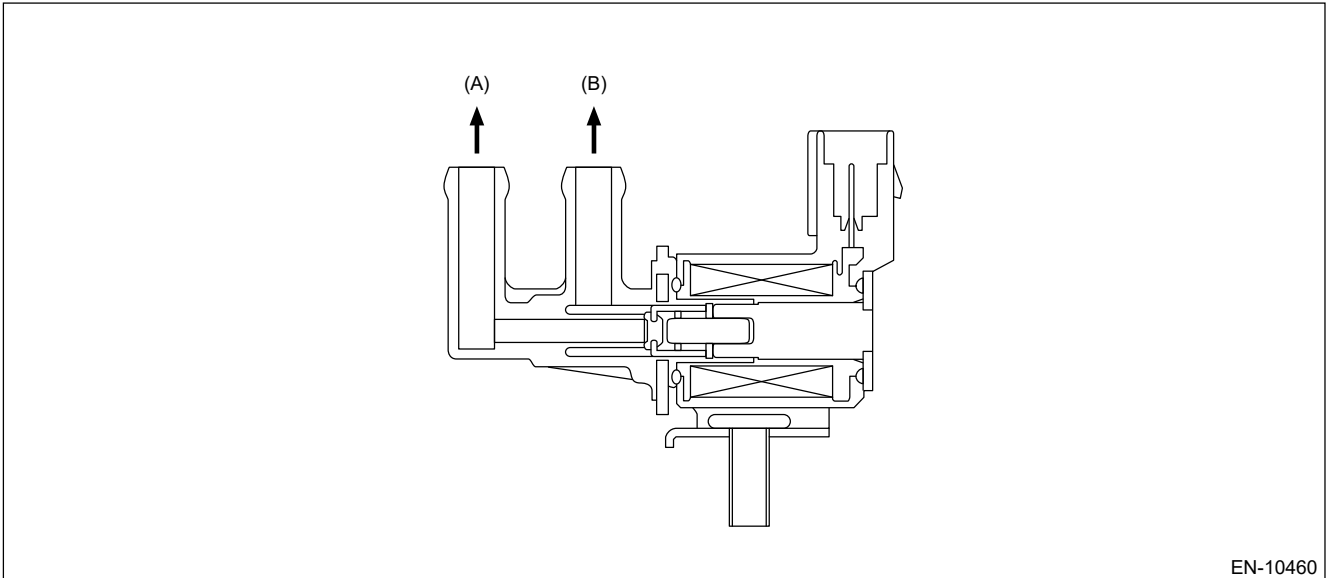
Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of the purge control solenoid valve 2.

Judge as NG when the ECM output level differs from the actual terminal level.

2. COMPONENT DESCRIPTION



EN-10460

(A) To canister

(B) To intake manifold

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
ECM (Powered-on by Sub CPU)	ON
12 V battery system voltage	≥ 10.9 V
Solenoid Valve 2 for purge control signal	= ON

4. GENERAL DRIVING CYCLE

Always perform the diagnosis after starting the engine.

5. DIAGNOSTIC METHOD

Judgment value

Malfunction Criteria	Threshold Value
Output current	≥ 5 A

Time needed for diagnosis: 2250 ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P04AF EVAP SYSTEM PURGE CONTROL VALVE (CPC) "B" STUCK CLOSED



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

Improper idling

Caution:


After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

1. CHECK BETWEEN CANISTER AND PURGE CONTROL VALVE 2. 

Check the piping between the canister and the purge control valve 2.


Is there clogging in the piping between the canister and the purge control valve 2?

Yes

Repair or replace the piping between the canister and the purge control valve 2.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Delivery and Evaporation Lines.](#)

No


 [Go to 2.](#)

2. CHECK BETWEEN CANISTER AND PURGE CONTROL VALVE 2. 

Check the piping between the canister and the purge control valve 2.


Is there closed stuck state in the piping between the canister and the purge control valve 2?

Yes

Repair or replace the purge control valve 2.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Purge Control Solenoid Valve.](#)

No



 [Go to 3.](#)

3. CHECK PIPING BETWEEN PURGE CONTROL VALVE 2 AND TURBOCHARGER. 

Check the piping between the purge control valve 2 and the turbocharger.

Is there clogging in the piping between the purge control valve 2 and the turbocharger?

Yes

Repair or replace the piping between the purge control valve 2 and the turbocharger.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Purge Control Solenoid Valve.](#)  [Ref. to INTAKE \(INDUCTION\)\(H4DOTC\)>Turbocharger.](#)

No


 [Go to 4.](#)

4. CHECK EVAPORATIVE EMISSION CONTROL SYSTEM.

Perform drive cycle I. [Ref. to Target Not Found](#)

Is DTC P04AF displayed on the display?

Yes


Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly.](#)

No

End.

1. OUTLINE OF DIAGNOSIS

Note:

- **For the detection standard, refer to P0455.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0455 EVAP SYSTEM \(CPC\) LEAK DETECTED \(LARGE LEAK\).](#)**

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P04DB CRANKCASE VENTILATION SYSTEM (PCV) DISCONNECTED



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

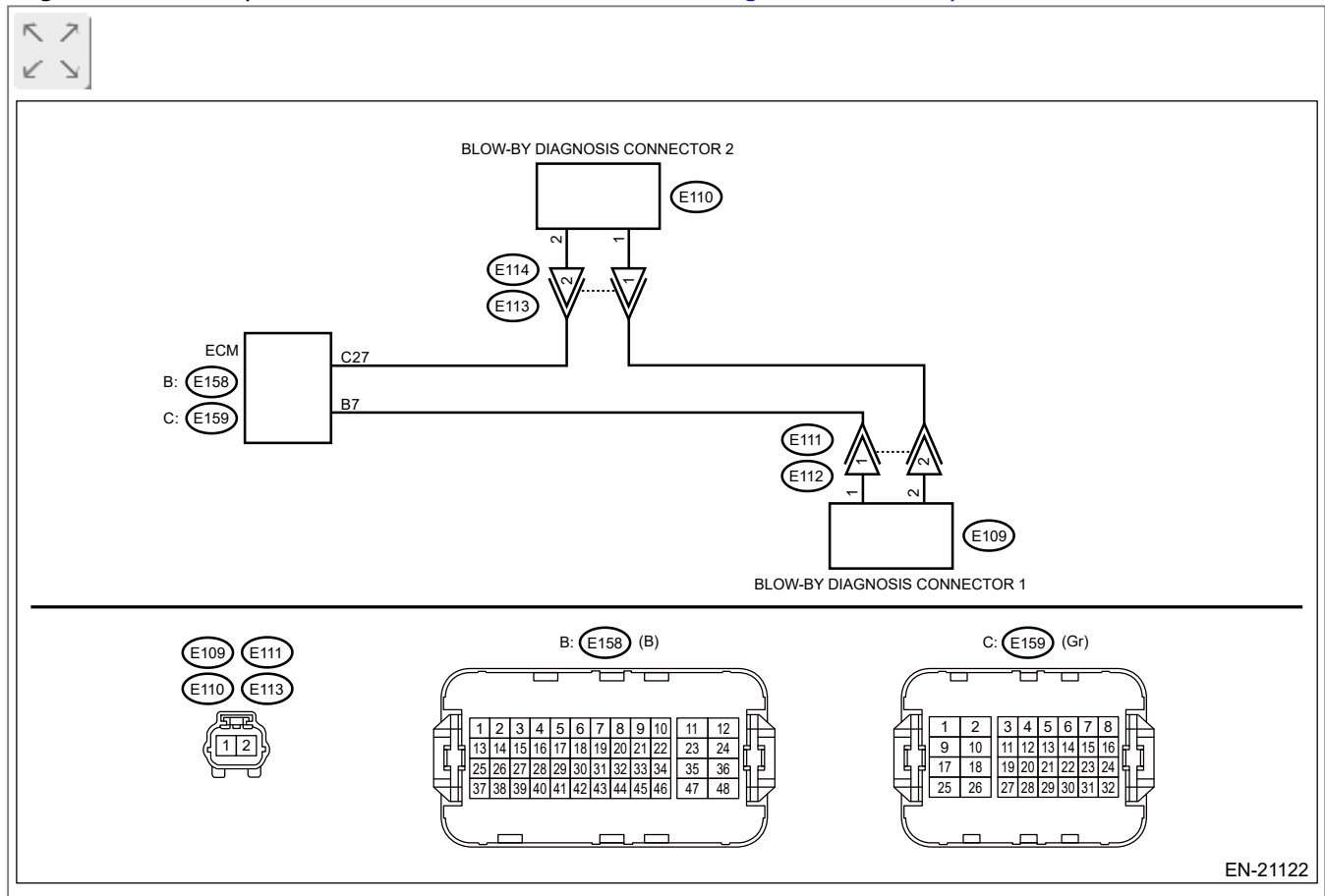
Improper idling

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)




EN-21122

1. CHECK BLOW-BY HOSE.


Check the blow-by hose condition.

Is there any disconnection or crack in blow-by hose?

 Install or replace the blow-by hose.

Yes

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND PCV HOSE ASSEMBLY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the PCV hose assembly.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and PCV hose assembly connector.

Connector & terminal

(E158) No. 7 – (E109) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and PCV hose assembly connector**
- **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND PCV HOSE ASSEMBLY CONNECTOR.


Measure the resistance between PCV hose assembly connector and chassis ground.

Connector & terminal

(E158) No. 7 – Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair the short circuit to ground in harness between ECM connector and PCV hose assembly connector.

4. CHECK HARNESS BETWEEN LEAK DIAGNOSIS CONNECTORS.


Measure the resistance of harness between leak diagnosis connectors.

Connector & terminal

(E109) No. 2 — (E110) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 5.](#)

No

Repair the open circuit in the wiring harness between leak diagnosis connectors.

5. CHECK GROUND CIRCUIT OF PCV HOSE ASSEMBLY.

Measure the resistance of harness between PCV hose assembly connector and engine ground.

Connector & terminal

(E110) No. 2 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 6.](#)

No

Repair the open circuit in harness between PCV hose assembly connector and engine ground.

6. CHECK PCV HOSE ASSEMBLY.

Measure the resistance between terminals of each leak diagnosis connector.

Terminals

No. 1 — No. 2

Is the resistance less than 1 Ω at all measurement?

Yes

Repair the poor contact of ECM and PCV hose assembly connector.

No

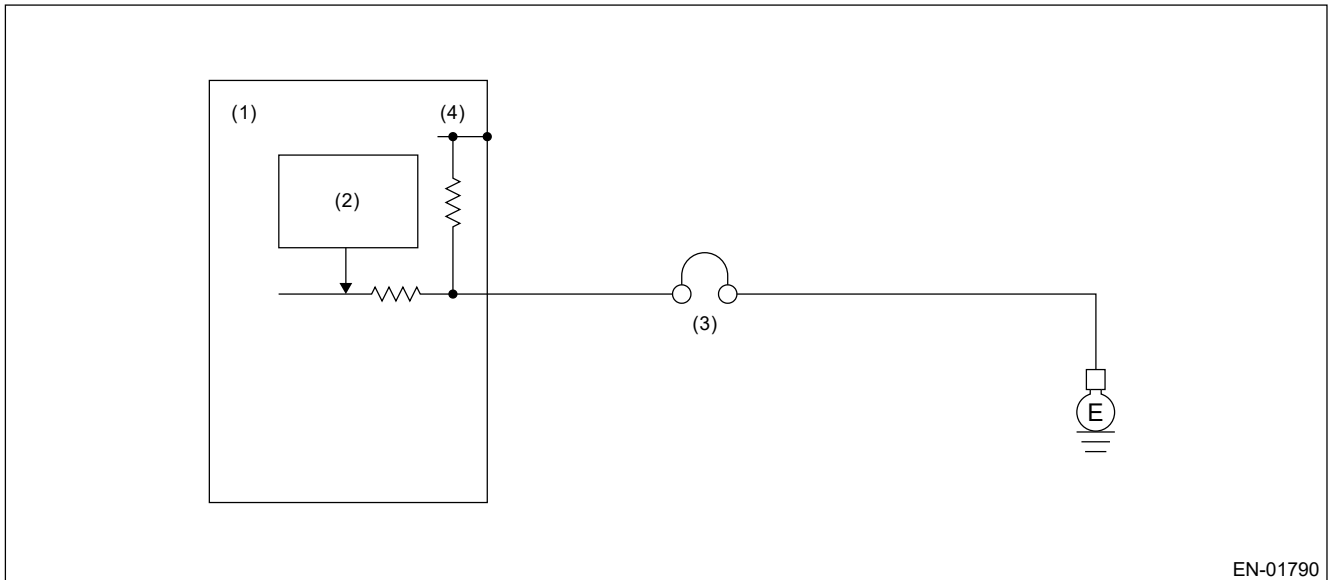
Replace the PCV hose assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>PCV Hose Assembly.](#)

1. OUTLINE OF DIAGNOSIS

Detect the blow-by hose disconnection abnormality.

Judge as NG when the diagnosis terminal voltage is high.

2. COMPONENT DESCRIPTION



- (1) Engine control module (ECM) (3) PCV diagnosis connector (4) 5 V
 (2) Detecting circuit

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Positive crankcase ventilation diagnosis voltage	$> 2.8 \text{ V}$

Time needed for diagnosis: 2500 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P04F0 EVAP SYSTEM HIGH PRESSURE PURGE LINE (CPC2) PERFORMANCE



DTC detecting condition:


Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

Improper idling


Caution:

After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode>OPERATION.](#) and Inspection Mode  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode>PROCEDURE.](#)


1. CHECK FOR ANY OTHER DTC ON DISPLAY. 


Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

No



 [Go to 2.](#)

2. CHECK PIPING BETWEEN PURGE CONTROL VALVE 2 AND TURBOCHARGER. 


Check the piping between the purge control valve 2 and the turbocharger.

Is there dislocation of the piping between the purge control valve 2 and the turbocharger?

Yes

Repair or replace the piping between the purge control valve 2 and the turbocharger.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Purge Control Solenoid Valve.](#)  [Ref. to INTAKE \(INDUCTION\)\(H4DOTC\)>Turbocharger.](#)

No



 [Go to 3.](#)

3. CHECK PIPING BETWEEN PURGE CONTROL VALVE 2 AND TURBOCHARGER. 

Check the piping between the purge control valve 2 and the turbocharger.

Is there clogging in the piping between the purge control valve 2 and the turbocharger?

Yes

Repair or replace the piping between the purge control valve 2 and the turbocharger.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Purge Control Solenoid Valve.](#)  [Ref. to INTAKE \(INDUCTION\)\(H4DOTC\)>Turbocharger.](#)

No



 [Go to 4.](#)

4. CHECK PURGE CONTROL VALVE 2.

Check the purge control valve 2.

Is there closed or open stuck state in the purge control valve 2?

Yes

Repair or replace the purge control valve 2 or leak check valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Purge Control Solenoid Valve.](#)  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly.](#)

No


 [Go to 5.](#)

5. CHECK PURGE CONTROL VALVE 1.


Check the main body of the purge control valve 1.

Is there any leakage in the main body of the purge control valve 1?

Yes

Repair or replace the purge control valve 1.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Purge Control Solenoid Valve.](#)


No

 [Go to 6.](#)

6. CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE.


1. Turn the ignition switch to OFF.
2. Make sure that the delivery mode fuse is removed.

Are there holes, cracks, clogging, or disconnection, misconnection of hoses or pipes in evaporative emission control system?


 Repair or replace the hoses or pipes.

Yes

No

 [Go to 7.](#)

7. CHECK VACUUM PUMP OPERATION OF LEAK CHECK VALVE ASSEMBLY.


Check the vacuum pump operation of the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly>INSPECTION.](#)

Does the vacuum pump operate?


Yes

 [Go to 8.](#)

No

Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly.](#)

8. CHECK SWITCHING VALVE OPERATION OF LEAK CHECK VALVE ASSEMBLY.


Check the switching valve operation of the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly>INSPECTION.](#)

Does the switching valve operate?

Yes

End.

No

Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly.](#)

1. OUTLINE OF DIAGNOSIS

Monitor Method

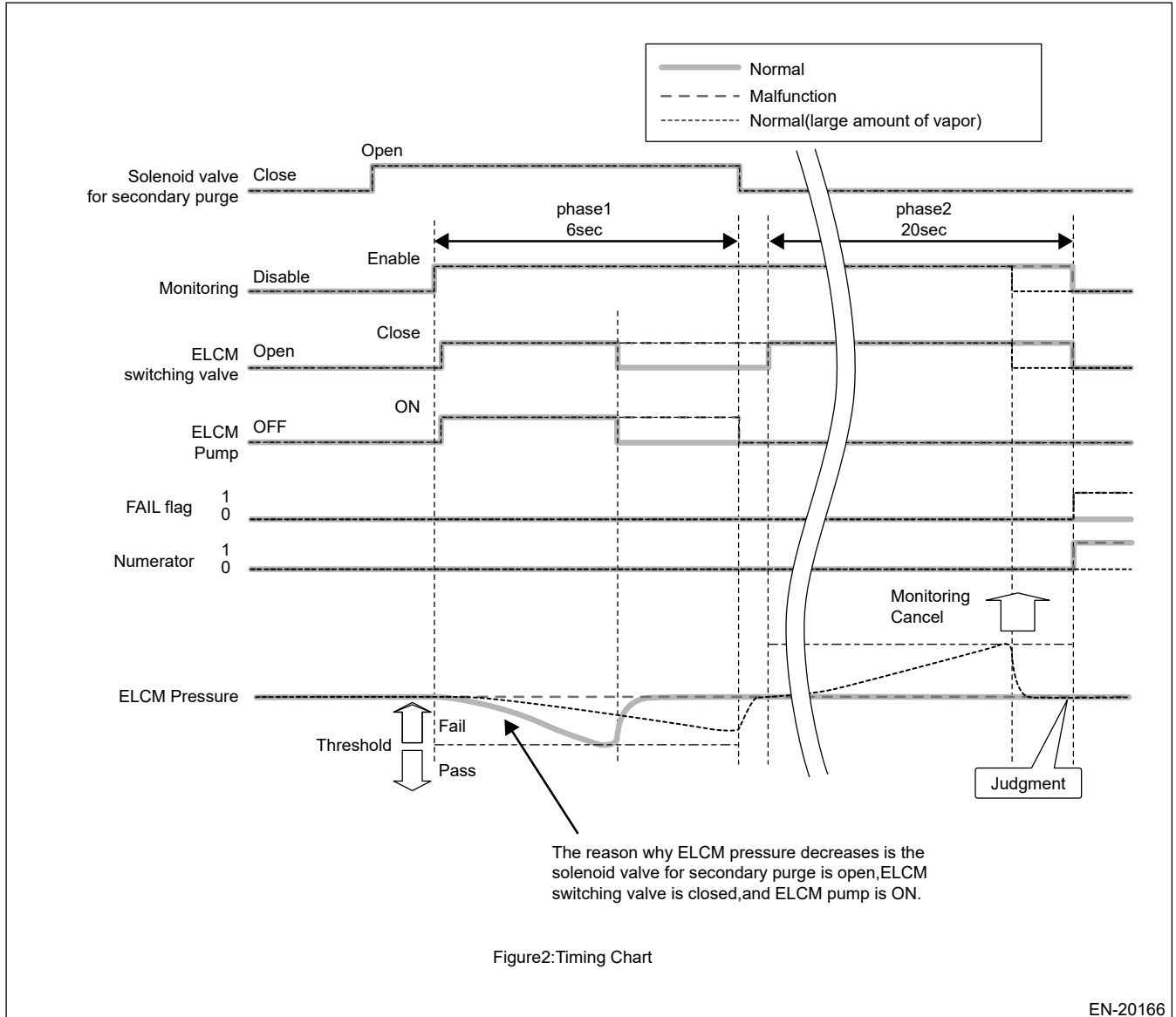
This monitor intrusively performs a functional check to detect incorrect purge flow when the engine is running in very high boost conditions.

Theory of operation: At very high boost conditions, the pressure drop caused by the air filter creates a slight vacuum in the high pressure purge line. Refer to following Figure 1.

Phase 1: The monitor removes the air in EVAP system by closing the ELCM switching valve and ELCM pump is intrusively activated when the solenoid valve for high pressure purge is open and all enable conditions are satisfied. In the case of normal condition, ELCM pressure (gauge) will

decrease to reach the threshold value. However, if the hose is disconnected, the ELCM pressure will remain above the threshold value.

Phase 2: Since there is a possibility that a large amount of EVAP vapor is generated during Phase 1, the monitor may determine a false fail. To prevent this condition, the EVAP system is sealed and the pressure is measured again after a predetermined time (following Phase 1). If the measured pressure exceeds a second threshold value, the monitor is cancelled. If the pressure does not reach the second threshold value, the monitor determines a malfunction (disconnection).



2. EXECUTION CONDITION

Secondary Parameters	Execution condition
(Common condition: Phase 1, Phase 2)	
Battery voltage	$\geq 10.9 \text{ V}$
Barometric pressure	$\geq 75.06 \text{ kPa (563 mmHg)}$

Fuel level	22.2 inHg) ≥ 9 L
<Phase 1>	
Integrated purge air amount since engine starting	≥ 72 g(*)
Time of purge control duty ratio = 0%	≥ 1 sec
Ambient air temperature	> 4.4°C and < 35°C (95°F)
Intake air amount per 1 second	> Map
High pressure purge line valve	Open

*: It takes approximately 2 min at 40 MPH.

Map

Fuel level (%)	15	17	33	50	67	83	100
Fuel level (L)	9	10	20	30	40	50	60
Intake air amount per 1 second (g/s)	80	80	60	60	60	60	60

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
<Phase 1>	
Evaporative Leak Check Module pressure (gauge)	> -267 KPa
<Phase 2>	
Evaporative Leak Check Module pressure (gauge)	< 267 KPa

Judgment 1

Time Needed for Diagnosis: 6 seconds

Judgment 2

Time Needed for Diagnosis: 20 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0500 VEHICLE SPEED SENSOR "A" CIRCUIT

DTC detecting condition:

Immediately at fault recognition

Caution:


After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

1. CHECK DTC OF VDC.

Check DTC of VDC.

Is DTC of VDC displayed?

Yes

Perform the diagnosis according to DTC.  Ref. to BRAKE CONTROL (DIAGNOSTICS)>List of Diagnostic Trouble Code (DTC).

No

Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Judge as NG when outside of the judgment value.

Judge NG when the received data from VDCCM&H/U is abnormal vehicle speed, and the vehicle speed data is impossible.

2. COMPONENT DESCRIPTION

Vehicle speed signals are taken in to the VDC control module and hydraulic control unit, and normal/erroneous data of the ABS wheel speed sensor is received by CAN communication from the VDC control module and hydraulic control unit.

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V

4. GENERAL DRIVING CYCLE

Perform the diagnosis every time after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Front ABS wheel speed sensor status	Malfunction
Either of the following is established	
Front left wheel speed	≥ 300 km/h (186.4 MPH)
Front right wheel speed	≥ 300 km/h (186.4 MPH)

Time needed for diagnosis: 2560 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0506 IDLE CONTROL SYSTEM RPM - LOWER THAN EXPECTED



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Hard to start the engine.
- Engine does not start.
- Improper idling
- Engine stalls.


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


 [Go to 2.](#)

2. CHECK AIR CLEANER ELEMENT.

1. Turn the ignition switch to OFF.
2. Check the air cleaner element.

Is there excessive clogging on air cleaner element?

Yes

Replace the air cleaner element.  [Ref. to INTAKE \(INDUCTION\) \(H4DOTC\)>Air Cleaner Element.](#)

No

 [Go to 3.](#)

3. CHECK ELECTRONIC THROTTLE CONTROL.

1. Remove the electronic throttle control.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\).](#)

[\(H4DOTC\)>Throttle Body>REMOVAL.](#)


2. Check the electronic throttle control.

Are foreign matter found inside electronic throttle control?

Yes

Remove foreign matter from electronic throttle control.

No

Perform the diagnosis of DTC P2101.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P2101 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE.](#)

1. OUTLINE OF DIAGNOSIS

Detect the malfunction that actual engine speed is not close to target engine speed during idling. Judge as NG when actual engine speed is not close to target engine speed during idling.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Barometric pressure	≥ 75.06 kPa (563 mmHg, 22.2 inHg)
Lambda value (left and right)	≥ 0.85 and < 1.151
Vehicle speed	= 0 km/h (0 MPH)
Engine coolant temperature	≥ 60°C (140°F)
Accelerator pedal position	= 0%
Elapsed time after gear position change (P ↔ D or N ↔ D)	> 5 s
Cold start diagnosis	Not in operation
Main feedback	In operation
Idle speed control feedback	In operation

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously at idling after warming up engine.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

--	--

Malfunction Criteria	Threshold Value
Actual engine speed – Target engine speed	< –100 rpm

Time needed for diagnosis: 15 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0507 IDLE CONTROL SYSTEM RPM - HIGHER THAN EXPECTED



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

Engine keeps running at higher speed than specified idle speed.

Caution:


After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".

 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 2.](#)

2. CHECK AIR INTAKE SYSTEM.

1. Start and idle the engine.

2. Check the following items.

- Loose installation of intake manifold and throttle body
- Cracks of intake manifold gasket and throttle body gasket
- Disconnection of vacuum hoses

Is there any fault in air intake system?

Yes


Repair air suction and leaks.

No

 [Go to 3.](#)

3. CHECK ELECTRONIC THROTTLE CONTROL.

1. Turn the ignition switch to OFF.

2. Remove the electronic throttle control.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Throttle Body>REMOVAL.](#)


3. Check the electronic throttle control.

Are foreign matter found inside electronic throttle control?

Yes

Remove foreign matter from electronic throttle control.

No

Perform the diagnosis of DTC P2101.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P2101 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE.](#)

1. OUTLINE OF DIAGNOSIS

Detect the malfunction that actual engine speed is not close to target engine speed during idling. Judge as NG when actual engine speed is not close to target engine speed during idling.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Barometric pressure	≥ 75.06 kPa (563 mmHg, 22.2 inHg)
Lambda value (left and right)	≥ 0.85 and < 1.151
Vehicle speed	= 0 km/h (0 MPH)
Engine coolant temperature	$\geq 60^{\circ}\text{C}$ (140 $^{\circ}\text{F}$)
Accelerator pedal position	= 0%
Elapsed time after gear position change (P \leftrightarrow D or N \leftrightarrow D)	> 5 s
Cold start diagnosis	Not in operation
Main feedback	In operation
Idle speed control feedback	In operation

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously at idling after warming up engine.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Actual engine speed – Target engine speed	> 200 rpm

Time needed for diagnosis: 15 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P050A COLD START IDLE CONTROL SYSTEM PERFORMANCE



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Engine keeps running at higher speed than specified idle speed.
- Engine keeps running at a lower speed than the specified idle speed.
- Engine stalls.

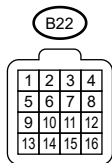
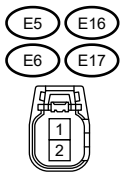
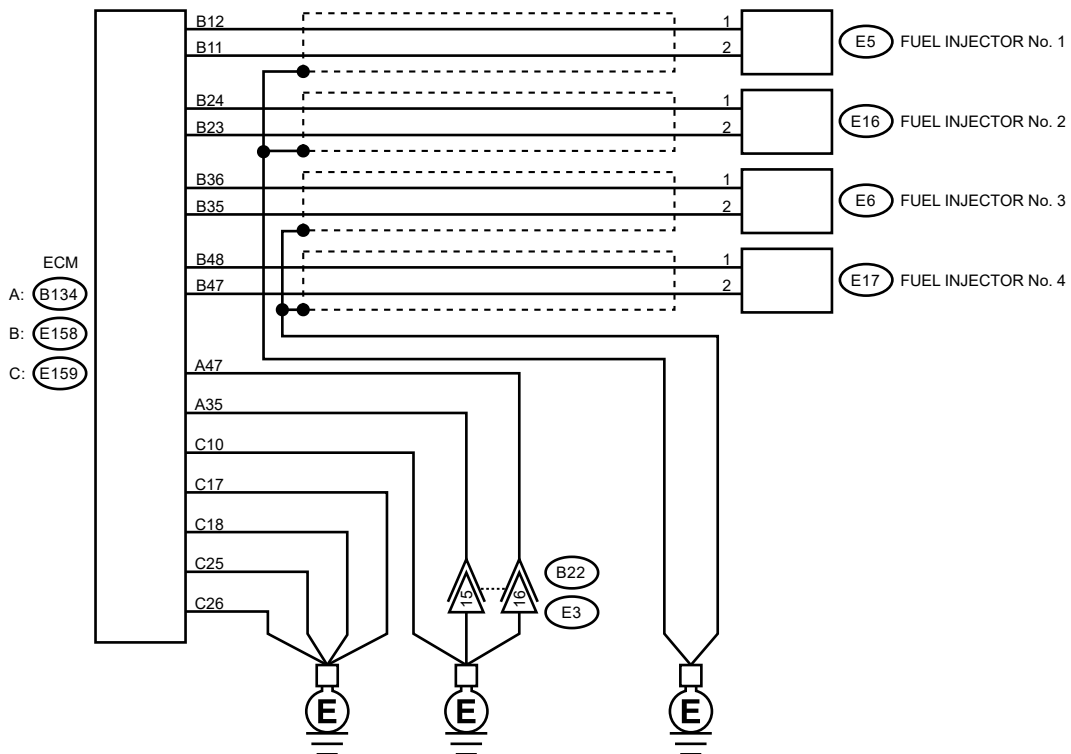
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.

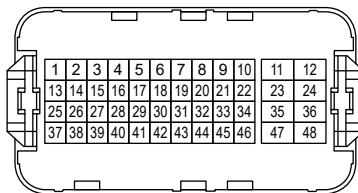




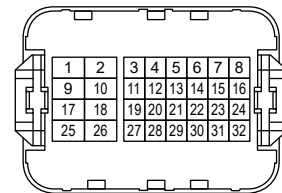
A: (B134) (Br)

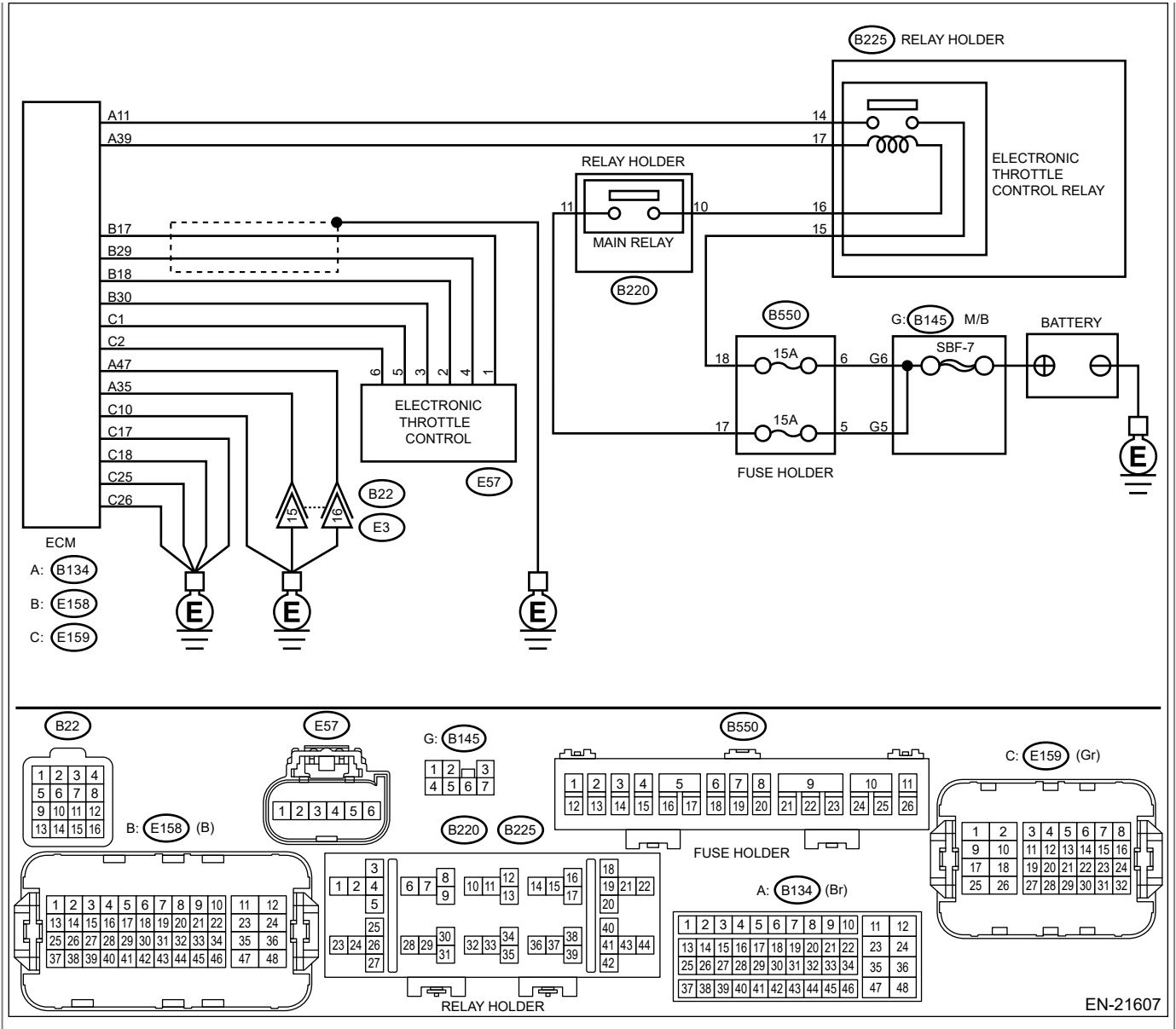
1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48

B: (E158) (B)



C: (E159) (Gr)





1. CHECK FOR ANY OTHER DTC ON DISPLAY.



Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".

[Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


[Go to 2.](#)

2. CHECK ENGINE OIL.




Is there a proper amount of engine oil?

Yes

 [Go to 3.](#)

No

Replace engine oil.  [Ref. to LUBRICATION\(H4DO\)>Engine Oil>REPLACEMENT.](#)


3. CHECK EXHAUST SYSTEM.

Are there holes or loose bolts on exhaust system?

Yes

Repair the exhaust system.

No

 [Go to 4.](#)


4. CHECK AIR INTAKE SYSTEM.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes

Repair the air intake system.

No

 [Go to 5.](#)

5. CHECK FUEL PRESSURE.

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.

Measure the fuel pressure.  [Ref. to MECHANICAL\(H4DOTC\)>Fuel Pressure>INSPECTION.](#)

Caution:



Release fuel pressure before removing the fuel pressure gauge.

Is the measured value 328 — 358 kPa (3.3 — 3.7 kgf/cm², 48 — 52 psi)?

Yes

 [Go to 6.](#)


No

Check the fuel pump and fuel delivery line.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pump>INSPECTION.](#)  [Ref. to FUEL INJECTION](#)

6. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Coolant Temp.].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Coolant Temp.] 75°C (167°F) or more?

Yes

 [Go to 7.](#)


No

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Coolant Temperature Sensor.](#)

7. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.


1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. Place the select lever in "P" range or "N" range.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Using the Subaru Select Monitor or a general scan tool, read the value of [Mass Air Flow].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Mass Air Flow] 2.0 — 5.0 g/s (0.26 — 0.66 lb/m)?

Yes

 [Go to 8.](#)


No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

8. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. Place the select lever in "P" range or "N" range.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Open the front hood.
6. Measure the ambient temperature.
7. Using the Subaru Select Monitor or a general scan tool, read the value of [IAT Sensor #11].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Subtract ambient temperature from [IAT Sensor #11]. Is the obtained value $-10 - 50^{\circ}\text{C}$ ($-18 - 90^{\circ}\text{F}$)?

Yes

 [Go to 9.](#)

No

Check the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

9. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector on faulty cylinders.
3. Measure the resistance between fuel injector connector and engine ground on faulty cylinders.

Connector & terminal

- #1 (E5) No. 1 — Engine ground:
- #1 (E5) No. 2 — Engine ground:
- #2 (E16) No. 1 — Engine ground:
- #2 (E16) No. 2 — Engine ground:
- #3 (E6) No. 1 — Engine ground:
- #3 (E6) No. 2 — Engine ground:
- #4 (E17) No. 1 — Engine ground:
- #4 (E17) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 10.](#)

No

Repair the short circuit to ground in harness between ECM and fuel injector connector.

10. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.




Measure the resistance of harness between ECM and fuel injector connector on faulty cylinders.

Connector & terminal

- #1 (E158) No. 12 — (E5) No. 1:
- #1 (E158) No. 11 — (E5) No. 2:
- #2 (E158) No. 24 — (E16) No. 1:
- #2 (E158) No. 23 — (E16) No. 2:
- #3 (E158) No. 36 — (E6) No. 1:
- #3 (E158) No. 35 — (E6) No. 2:
- #4 (E158) No. 48 — (E17) No. 1:
- #4 (E158) No. 47 — (E17) No. 2:

Is the resistance less than 1 Ω ?

Yes


 [Go to 11.](#)

No

Repair the open circuit in harness between ECM and fuel injector connector.


11. CHECK FUEL INJECTOR.




Check the fuel injector on faulty cylinder.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Injector>INSPECTION.](#)

Are fuel injectors OK?

Yes

 [Go to 12.](#)



No

Replace the faulty fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Injector.](#)


12. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR/CRANKSHAFT POSITION SENSOR.

Is the camshaft position sensor or crankshaft position sensor loosely installed?

Yes

Tighten the camshaft position sensor or crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Camshaft Position Sensor>INSTALLATION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Crankshaft Position Sensor>INSTALLATION.](#)


No

 [Go to 13.](#)

13. CHECK CRANKSHAFT POSITION SENSOR PLATE.

Is the crankshaft position sensor plate rusted or does it have broken teeth?

Yes

Replace the crankshaft position sensor plate.  [Ref. to MECHANICAL\(H4DOTC\)>Cylinder Block.](#)

No

 [Go to 14.](#)


14. CHECK INSTALLATION CONDITION OF TIMING CHAIN.

Turn the crankshaft using ST, and align the alignment mark on crank sprocket with alignment mark on cylinder block.


ST 18252AA00 CRANKSHAFT SOCKET

Is the timing chain dislocated from its proper position?

Yes

Correct the installation condition of timing chain.  [Ref. to MECHANICAL\(H4DOTC\)>Timing Chain Assembly.](#)

No

 [Go to 15.](#)

15. CHECK ELECTRONIC THROTTLE CONTROL RELAY.


1. Turn the ignition switch to OFF.
2. Remove the electronic throttle control relay.
3. Connect the battery to terminals No. 16 and No. 17 of electronic throttle control relay.
4. Measure the resistance between electronic throttle control relay terminals.

Terminals


No. 14 — No. 15:

Is the resistance less than 1 Ω ?

Yes

 [Go to 16.](#)

No

Replace the electronic throttle control relay.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Electronic Throttle Control Relay.](#)

16. CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY.


Measure the voltage between electronic throttle control relay connector and chassis ground.

Connector & terminal

(B225) No. 15 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 17.](#)

No

Repair the open or short to ground in the power supply circuit.

17. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY CONNECTOR.

1. Disconnect the connector from ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between electronic throttle control relay connector and chassis ground.

Connector & terminal


(B225) No. 17 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power in the harness between ECM and electronic throttle control relay connector.

No

 [Go to 18.](#)

18. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the resistance between electronic throttle control relay connector and chassis ground.


Connector & terminal

(B225) No. 14 — Chassis ground:

(B225) No. 17 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 19.](#)

No

Repair the short circuit in harness to ground between ECM and electronic throttle control relay connector.

19. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY CONNECTOR.

Measure the resistance between ECM and electronic throttle control relay connector.


Connector & terminal

(B134) No. 39 — (B225) No. 17:

(B134) No. 11 — (B225) No. 14:

Is the resistance less than 1 Ω ?

Yes

 [Go to 20.](#)

No

Repair the open circuit in harness between ECM and electronic throttle control relay connector.

20. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connectors from electronic throttle control.
3. Measure the resistance between ECM and engine ground.

Connector & terminal

- (E158) No. 18 — Engine ground:
- (E158) No. 17 — Engine ground:
- (E158) No. 17 — (E158) No. 28:
- (E158) No. 29 — Engine ground:
- (E158) No. 29 — (E158) No. 28:

Is the resistance 1 M Ω or more?

Yes

 [Go to 21.](#)

No

Repair the short circuit to ground in harness between ECM and electronic throttle control connector.

21. CHECK SHORT CIRCUIT INSIDE THE ECM.


1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal


- (E57) No. 1 — Engine ground:
- (E57) No. 4 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 22.](#)

No

Repair the short circuit to ground in harness between ECM and electronic throttle control connector. Replace the ECM if defective.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)

22. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.


1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM and electronic throttle control connector.

Connector & terminal

(E158) No. 17 — (E57) No. 1:
(E158) No. 30 — (E57) No. 3:
(E158) No. 29 — (E57) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 23.](#)

No

Repair the open circuit of harness between ECM and electronic throttle control connector.

23. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 3 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 24.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- Open circuit of harness between ECM and engine ground
- Poor contact of ECM connector
- Poor contact of coupling connector

24. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.


1. Turn the ignition switch to ON.
2. Measure the voltage between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 1 (+) — Engine ground (-):

(E57) No. 4 (+) — Engine ground (-):


Is the voltage 5 V or more?

 Repair the short circuit to power in harness between ECM and electronic

Yes

throttle control connector.

No

 [Go to 25.](#)

25. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.


Connector & terminal

(E158) No. 18 — (E158) No. 17:

(E158) No. 18 — (E158) No. 29:

Is the resistance 1 MΩ or more?

Yes

 [Go to 26.](#)

No

Repair the short circuit to power in harness between ECM and electronic throttle control connector.

26. CHECK SENSOR OUTPUT.

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Using the Subaru Select Monitor, read the value in [Main-Throttle Sensor].

Note:


For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

Is the value of [Main-Throttle Sensor] 0.60 — 0.65 V?

Yes

 [Go to 27.](#)


No

Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Throttle Body.](#)

27. CHECK SENSOR OUTPUT.


Using the Subaru Select Monitor, read the value in [Sub-Throttle Sensor].

Note:


For detailed procedures, refer to "Data Monitor".  **Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Subaru Select Monitor.**

Is the value of [Sub-Throttle Sensor] 0.60 – 0.65 V?

Yes

 [Go to 28.](#)

No

Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Throttle Body.](#)

28. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from electronic throttle control.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM and electronic throttle control connector.


Connector & terminal

(E159) No. 1 – (E57) No. 5:

(E159) No. 2 – (E57) No. 6:

Is the resistance less than 1 Ω ?

Yes

 [Go to 29.](#)

No

Repair the open circuit of harness between ECM and electronic throttle control.

29. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 5 (+) – Engine ground (-):


(E57) No. 6 (+) – Engine ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in harness between ECM and electronic throttle control connector.

No

 [Go to 30.](#)

30. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between electronic throttle control connector and engine ground.


Connector & terminal

(E57) No. 5 — Engine ground:

(E57) No. 6 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 31.](#)

No

Repair the short circuit to ground in harness between ECM and electronic throttle control connector.

31. CHECK ELECTRONIC THROTTLE CONTROL MOTOR HARNESS.


Measure the resistance between electronic throttle control connectors.

Connector & terminal

(E57) No. 5 — (E57) No. 6:

Is the resistance 1 M Ω or more?

Yes

 [Go to 32.](#)

No

Repair the short circuit of harness between ECM and electronic throttle control connector.

32. CHECK ELECTRONIC THROTTLE CONTROL GROUND CIRCUIT.


Measure the resistance between ECM and engine ground.

Connector & terminal

(B134) No. 35 — Engine ground:
(B134) No. 47 — Engine ground:
(E159) No. 10 — Engine ground:
(E159) No. 17 — Engine ground:
(E159) No. 18 — Engine ground:
(E159) No. 25 — Engine ground:
(E159) No. 26 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 33.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM and engine ground**
- **Poor contact of coupling connector**

33. CHECK ELECTRONIC THROTTLE CONTROL.


Measure the resistance between electronic throttle control terminals.

Terminals


No. 5 — No. 6:

Is the resistance 50 Ω or less?

Yes

 [Go to 34.](#)

No

Replace the electronic throttle control.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Throttle Body.](#)

34. CHECK ELECTRONIC THROTTLE CONTROL.


Move the throttle valve to the fully opened and fully closed positions with fingers.
Check that the valve returns to the specified position when releasing fingers.

Does the valve return to the specified position? Standard value: 3 mm (0.12 in) from fully closed position

Yes

Repair the poor contact of ECM connector.

No

Replace the electronic throttle control.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Throttle Body.](#)

1. OUTLINE OF DIAGNOSIS

WHEN COLD, THE ABNORMALITY IN THE CONTROL OF TARGET ENGINE SPEED INCREASE IS DETECTED. (P050A)

Judge as NG if the idle speed diagnosis is NG.

- Idle speed diagnosis

Judge as NG when actual engine speed is not close to target engine speed at cold start.

DETECT MALFUNCTIONS OF THE CATALYST ADVANCED IDLING RETARD ANGLE CONTROL. (P050B)

Judge as NG when ECM is not controlling the angle properly during catalyst advanced idling retard angle control.

- Final ignition timing diagnosis

Judge as NG when actual retard amount is under the specified value at cold start.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
<Idle speed diagnosis>	
Battery voltage	≥ 10.9 V
Barometric pressure	≥ 75 kPa (563 mmHg, 22.2 inHg)
Vehicle speed	≤ 2 km/h (1.2 MPH)
Engine coolant temperature	≤ 75°C (167°F)
Throttle position	< 0.37°CA
Integrated value of intake air amount	< Value from Map
Elapsed time after gear position change (P ↔ D or N ↔ D)	≥ 3000 ms
Elapsed time after starting the engine	≥ 2000 ms
<Final ignition timing diagnosis>	
Battery voltage	≥ 10.9 V
Barometric pressure	≥ 75 kPa (563 mmHg, 22.2 inHg)
Vehicle speed	≤ 2 km/h (1.2 MPH)
Engine coolant temperature	≤ 75°C (167°F)
Throttle position	< 0.37°CA
Integrated value of intake air	< Value from Map

amount	
Elapsed time after gear position change (P ↔ D or N ↔ D)	≥ 3000 ms
Target retard amount	≥ 10°CA

Map

Engine coolant temperature at engine starting °C (°F)	-40 (-40)	-30 (-22)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)
Integrated value of intake air amount g (oz)	833 (26.38)	833 (26.38)	750 (26.45)	683 (24.09)	683 (24.09)	683 (24.09)	633 (22.33)	633 (22.33)

Engine coolant temperature at engine starting °C (°F)	40 (104)	50 (122)	60 (140)	70 (158)	75 (167)
Integrated value of intake air amount g (oz)	607 (21.41)	607 (21.41)	553 (19.5)	467 (16.47)	467 (16.47)

3. DIAGNOSTIC METHOD

IDLE SPEED DIAGNOSIS

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Actual engine speed – Target engine speed	< –300 rpm

Time needed for diagnosis: 7 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

FINAL IGNITION TIMING DIAGNOSIS

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Final ignition timing – ignition timing during CSERS* *: Ignition timing during CSERS (Cold Start Emission Reduction Strategy) = Base ignition timing – retard amount	> 12°CA


Time needed for diagnosis: 7 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P050B COLD START IGNITION TIMING PERFORMANCE

Note:

For the diagnostic procedure, refer to DTC P050A.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P050A COLD START IDLE CONTROL SYSTEM PERFORMANCE.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P050A.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P050A COLD START IDLE CONTROL SYSTEM PERFORMANCE.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0512 STARTER (SWITCH) REQUEST CIRCUIT



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

Failure of engine to start

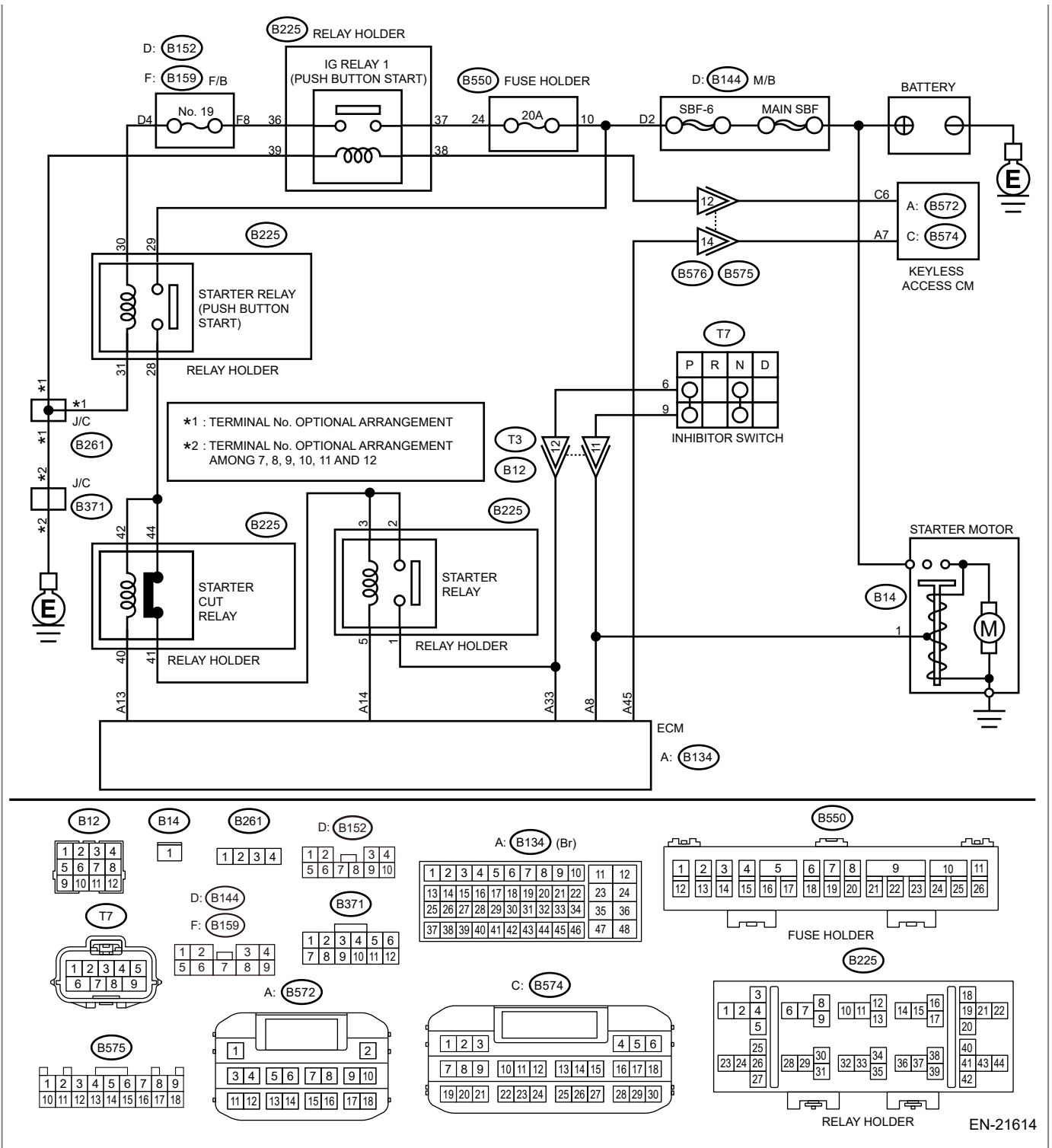
Caution:

- After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#) and Inspection Mode  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode..](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





1. CHECK PUSH BUTTON IGNITION SWITCH.

Operate the push button ignition switch.

Does it operate smoothly without catch?




Go to 2.




Yes

No


Replace the push button ignition switch.  [Ref. to SECURITY AND LOCKS>Push Button Ignition Switch.](#)

2. CHECK DTC.

1. Clear the memory using the Subaru Select Monitor or general scan tool.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)
2. Start and idle the engine for three minutes or more.

Is the same DTC as current diagnosis output?

Yes

 [Go to 3.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

3. CHECK HARNESS BETWEEN ECM AND KEYLESS ACCESS CM.

1. Turn the ignition to OFF.
2. Disconnect the connector from ECM.
3. Turn the ignition to ON.
4. Measure the voltage between ECM and engine ground.

Connector & terminal

(B134) No. 45 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power supply in harness between ECM and keyless access CM.

No

Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Detect abnormal continuity in the starter SW.

Judge as ON NG when the starter SW signal remains ON.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 8\text{ V}$
Engine speed	$\geq 475\text{ rpm}$

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as ON NG.

Judgment value

Malfunction Criteria	Threshold Value
Starter SW1 voltage	$\geq 6\text{ V}$

Time needed for diagnosis: 30 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0516 BATTERY TEMPERATURE SENSOR CIRCUIT LOW

DTC detecting condition:

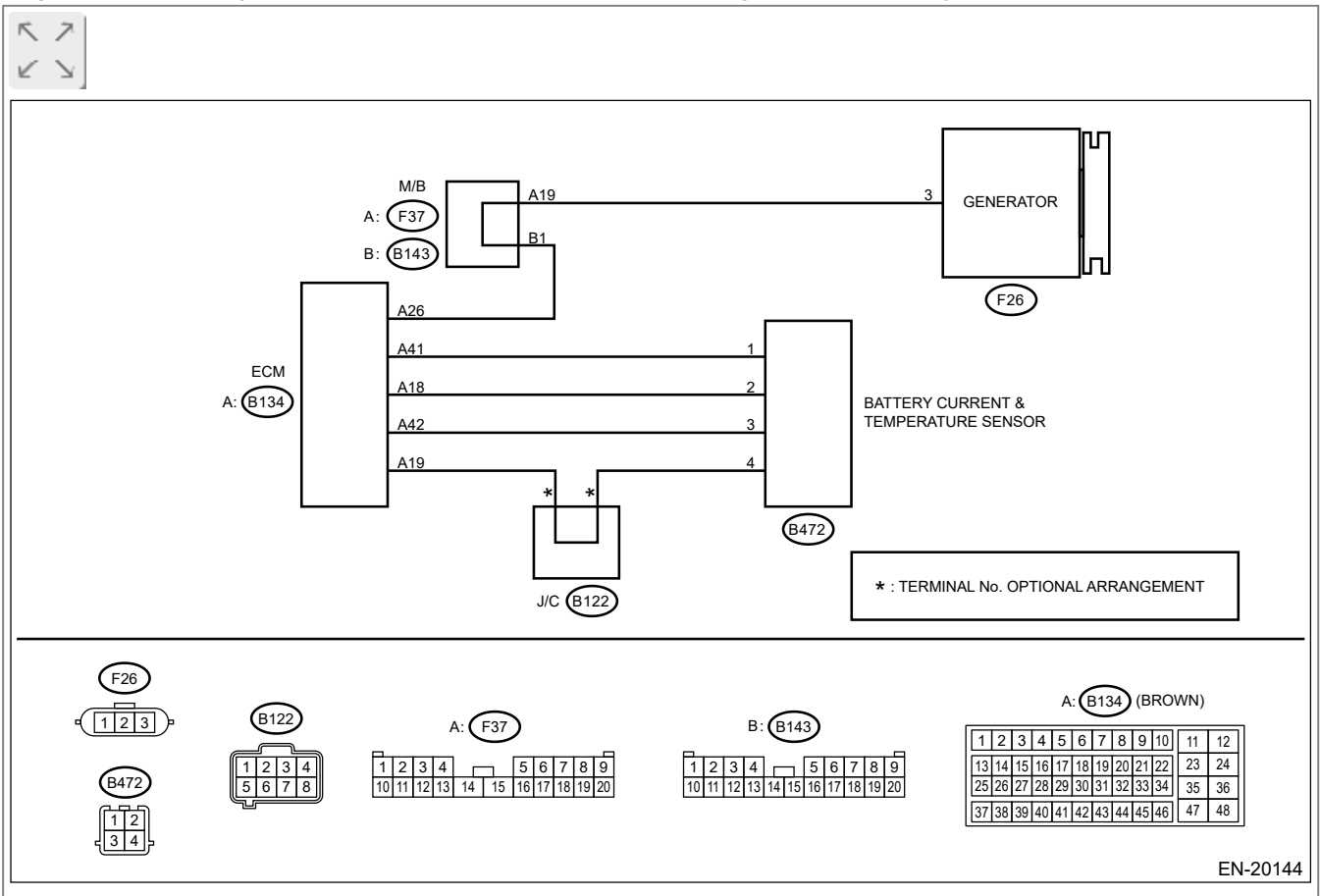
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



EN-20144

1. CHECK CURRENT DATA.



1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Battery temperature].

Note:

For detailed procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Subaru Select Monitor.

Is the value of [Battery temperature] 100°C (212°F) or more?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN ECM AND BATTERY CURRENT & TEMPERATURE SENSOR CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the battery current & temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM and engine ground.

Connector & terminal

(B134) No. 41 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

Replace the battery current & temperature sensor.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery Current & Temperature Sensor.](#)

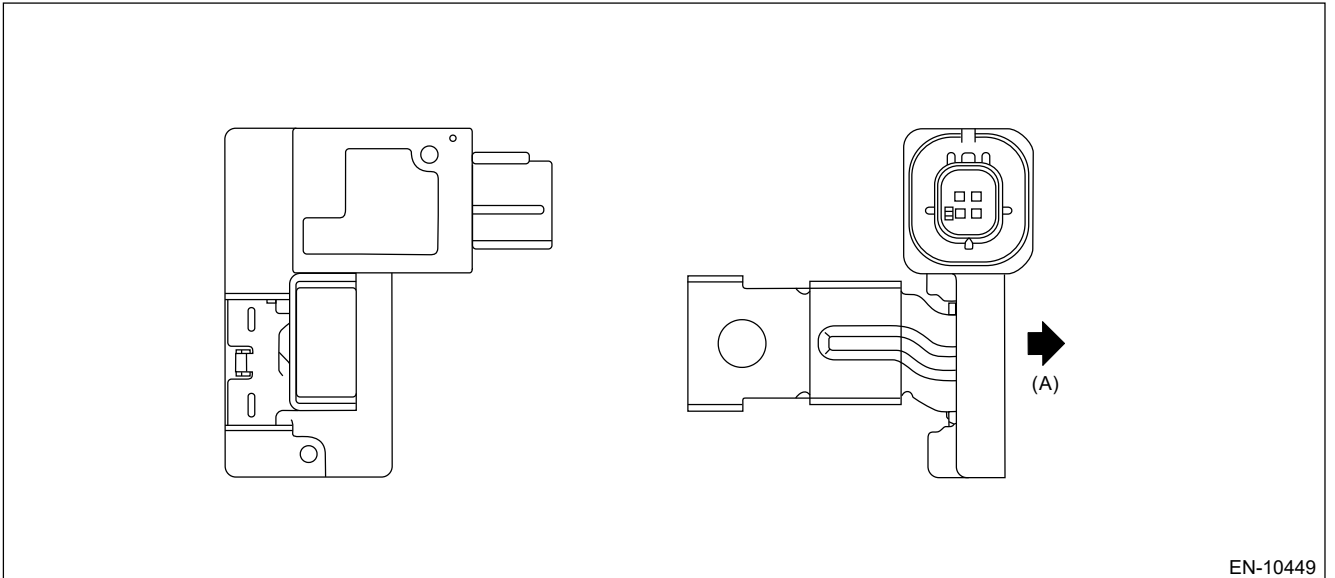
No

Repair the ground short circuit of harness between ECM and battery current & temperature sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of battery temperature sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-10449

(A) Positive direction of measured current

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Elapsed time after starting the engine	$> 1000 \text{ ms}$
Engine speed	$> 500 \text{ rpm}$
Ignition switch	ON

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$< 0.203 \text{ V}$

Time needed for diagnosis: 500 ms

Malfunction indicator light illumination: Does not illuminate even when malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0517 BATTERY TEMPERATURE SENSOR CIRCUIT HIGH

DTC detecting condition:

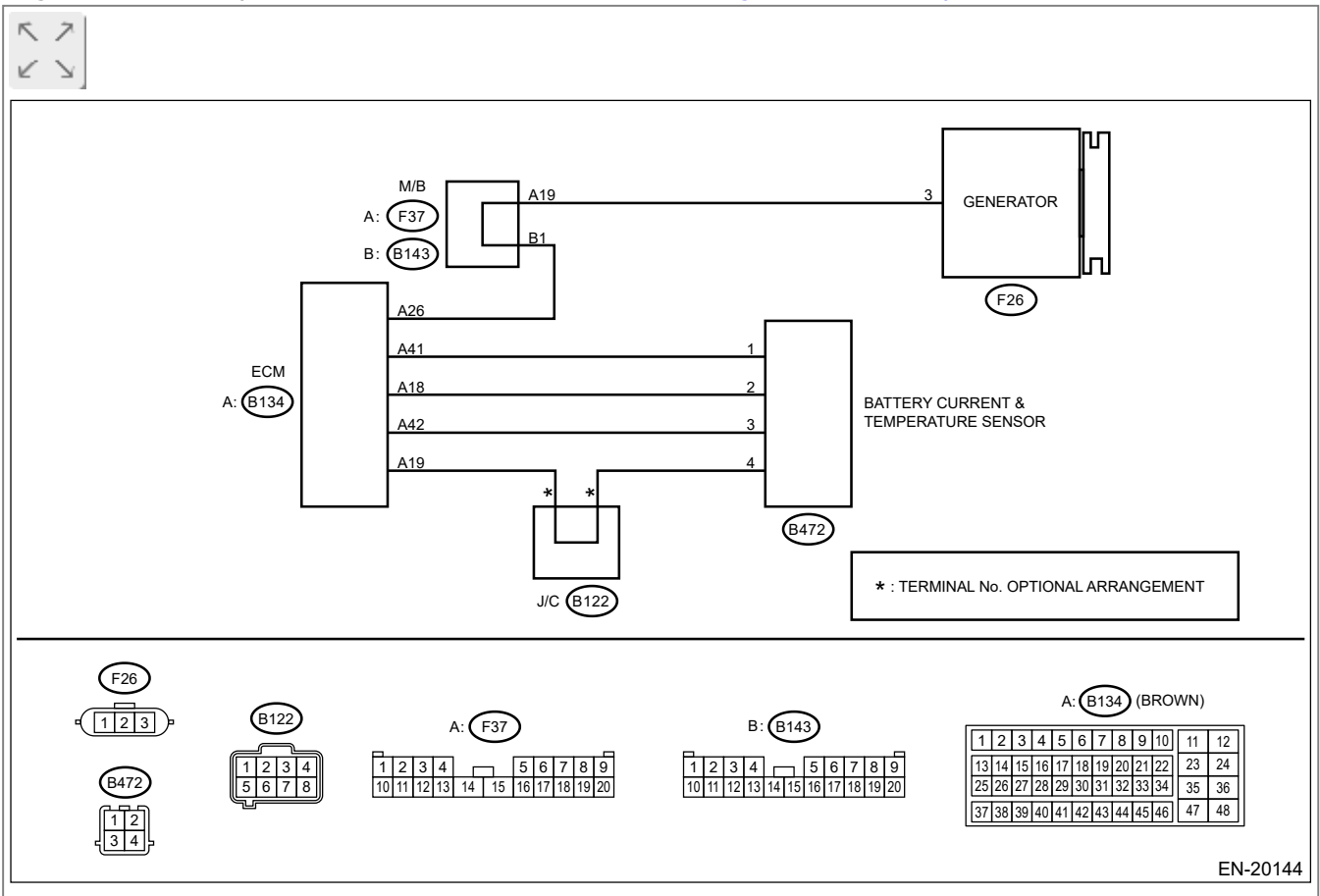
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK CURRENT DATA.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Battery temperature].

Note:

For detailed procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Subaru Select Monitor.

Is the value of [Battery temperature] -40°C (-40°F) or less?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK FOR POOR CONTACT.

Check for poor contact between the ECM and battery current & temperature sensor connectors.

Is there poor contact of the ECM or battery current & temperature sensor connectors?

Yes

Repair any poor contact between the ECM or battery current & temperature sensor connectors.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND BATTERY CURRENT & TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the battery current & temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and battery current & temperature sensor connector.

Connector & terminal

(B134) No. 41 — (B472) No. 1:

(B134) No. 19 — (B472) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and battery current & temperature sensor connector**
- **Poor contact of joint connector**

4. CHECK HARNESS BETWEEN ECM AND BATTERY CURRENT & TEMPERATURE SENSOR CONNECTOR.



1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM and engine ground.

Connector & terminal


(B134) No. 41 (+) — Engine ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power supply in harness between ECM and battery current & temperature sensor connector.

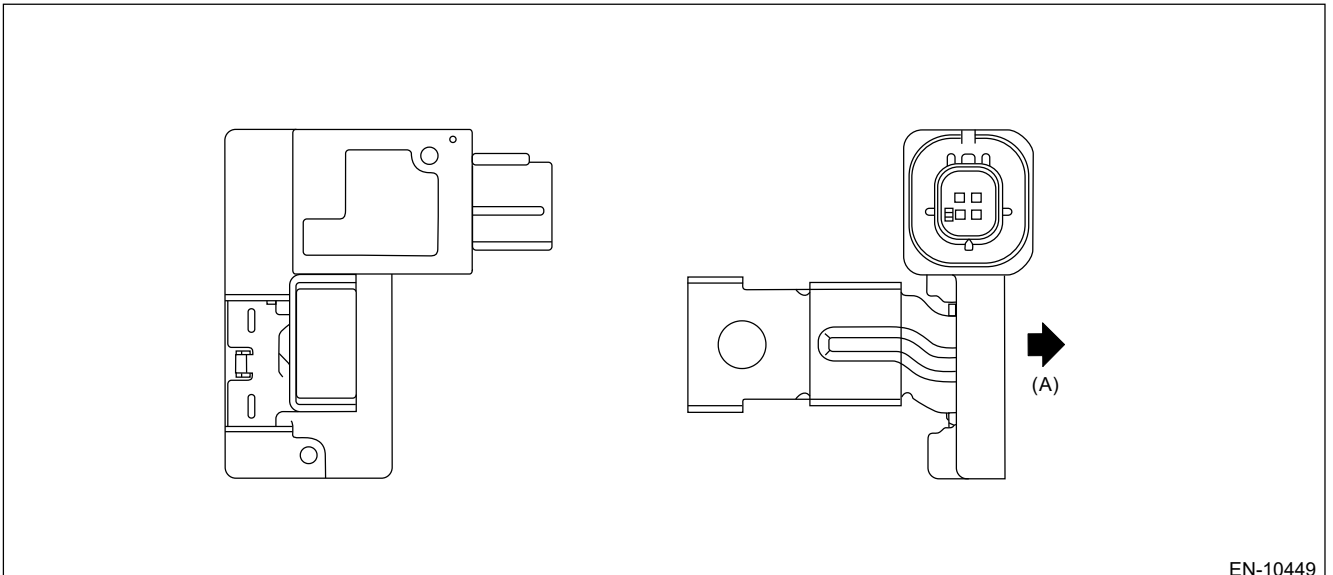
No

Replace the battery current & temperature sensor.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery Current & Temperature Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of battery temperature sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(A) Positive direction of measured current

3. EXECUTION CONDITION

Secondary Parameters	Execution condition

Battery voltage	≥ 10.9 V
Elapsed time after starting the engine	> 1000 ms
Engine speed	> 500 rpm
Ignition switch	ON

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	≥ 4.816 V

Time needed for diagnosis: 500 ms

Malfunction indicator light illumination: Does not illuminate even when malfunction occurs.


ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0560 SYSTEM VOLTAGE

DTC detecting condition:

Immediately at fault recognition

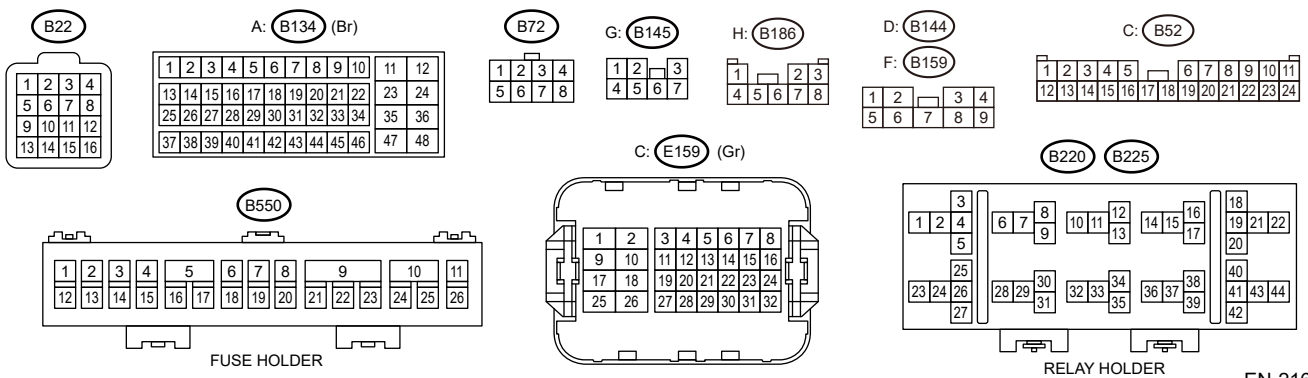
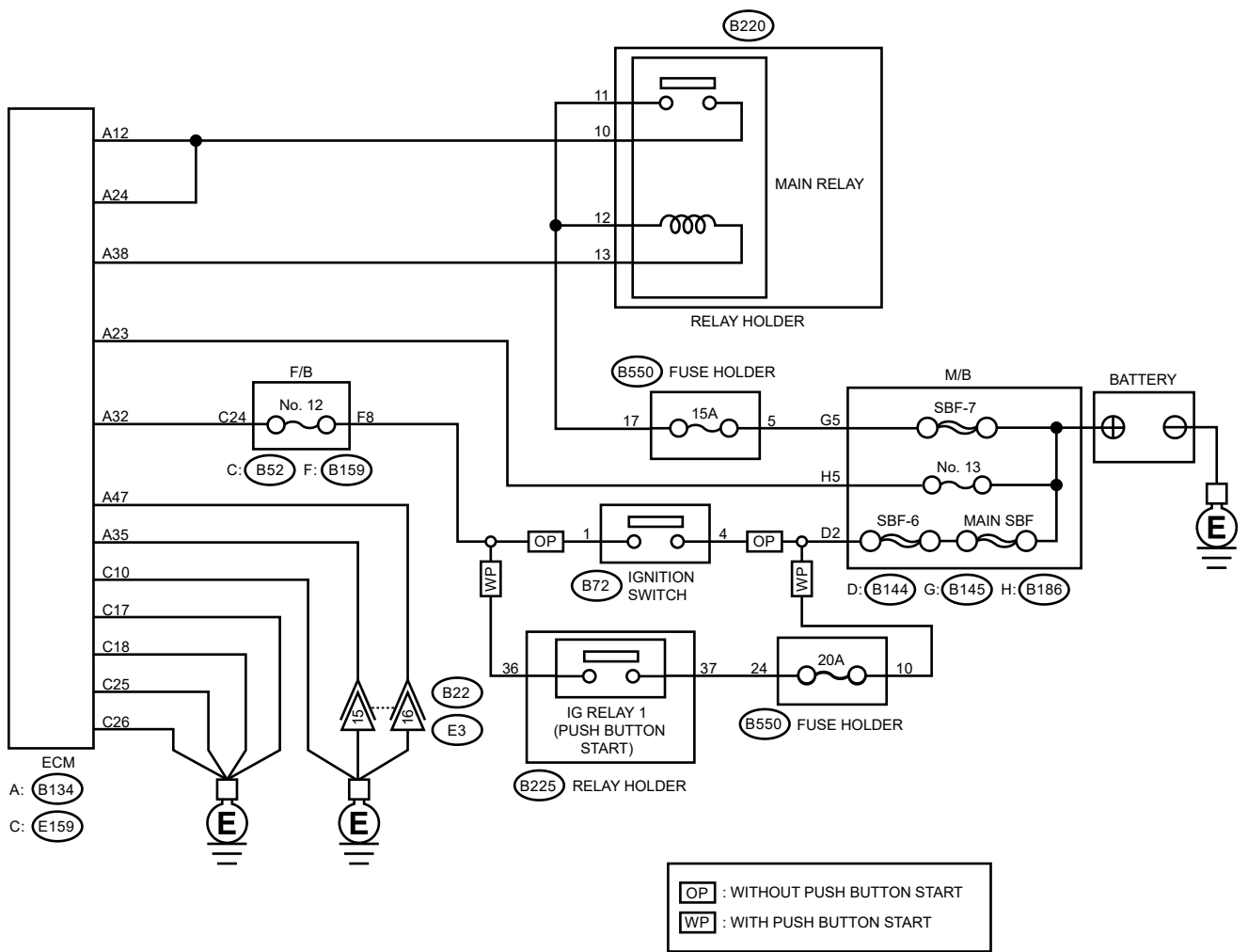
Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode. and Inspection Mode !\[\]\(9b33568d5c136f08ca688ce48be37574_img.jpg\) Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





EN-21611

1. CHECK INPUT SIGNAL OF ECM.

1. Turn the ignition switch to OFF.
2. Measure the voltage between ECM and chassis ground.

Connector & terminal


(B134) No. 23 (+) – Chassis ground (-):

Is the voltage 10 V or more?

Yes

Repair the poor contact of ECM connector.

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND MAIN FUSE BOX CONNECTOR.


1. Disconnect the connector from ECM.
2. Measure the resistance between ECM and chassis ground.

Connector & terminal

(B134) No. 23 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 3.](#)

No

Repair the ground short circuit of harness between ECM and battery terminal.

3. CHECK FUSE NO. 13 (MAIN FUSE BOX).

Is the fuse blown out?

Yes

Replace the fuse.

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and battery**
- **Poor contact of ECM connector**
- **Poor contact of battery terminal**

1. OUTLINE OF DIAGNOSIS

Detect the open/short circuit of back-up power supply circuit.
Judge as NG when the backup power voltage is low.

2. EXECUTION CONDITION

Secondary Parameters	Execution

	condition
Battery voltage	$\geq 10.9 \text{ V}$

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after starting the engine.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Voltage of back-up power supply	$< 6 \text{ V}$

Time needed for diagnosis: 2560 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR


DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Engine does not start.
- Engine stalls.


Caution:

After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode>OPERATION. and Inspection Mode !\[\]\(198f559926258ddfad814817bda0ffbc_img.jpg\) \[Ref. to ENGINE \\(DIAGNOSTICS\\)\\(H4DOTC\\)>Inspection Mode>PROCEDURE.\]\(#\)](#)

1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of microcomputer (RAM).

When there is a problem in the CPU normal RAM, judge as NG.

If it is possible to write data to the whole area of RAM in the initial routine, and is possible to read the same data, it is judged as OK, and if not, NG.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
ECM initialization	Execution

Diagnosis with the initial routine.

3. GENERAL DRIVING CYCLE

Perform the diagnosis as soon as the ignition switch is turned to ON.

4. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Write the specified value into the RAM.	Different from written value

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0605 INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR

Note:

For the diagnostic procedure, refer to DTC P0606.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0606 CONTROL MODULE PROCESSOR.](#)

1. OUTLINE OF DIAGNOSIS

Judge as NG when SUM value of ROM is outside the standard value.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
ECM initialization	Execution

3. GENERAL DRIVING CYCLE

Perform the diagnosis when the ignition switch is turned from OFF to ON.

4. DIAGNOSTIC METHOD

Judge as NG if the criteria below are met.

Judgment value

Malfunction Criteria	Threshold Value
SUM value of ROM	Malfunction

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0606 CONTROL MODULE PROCESSOR


DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

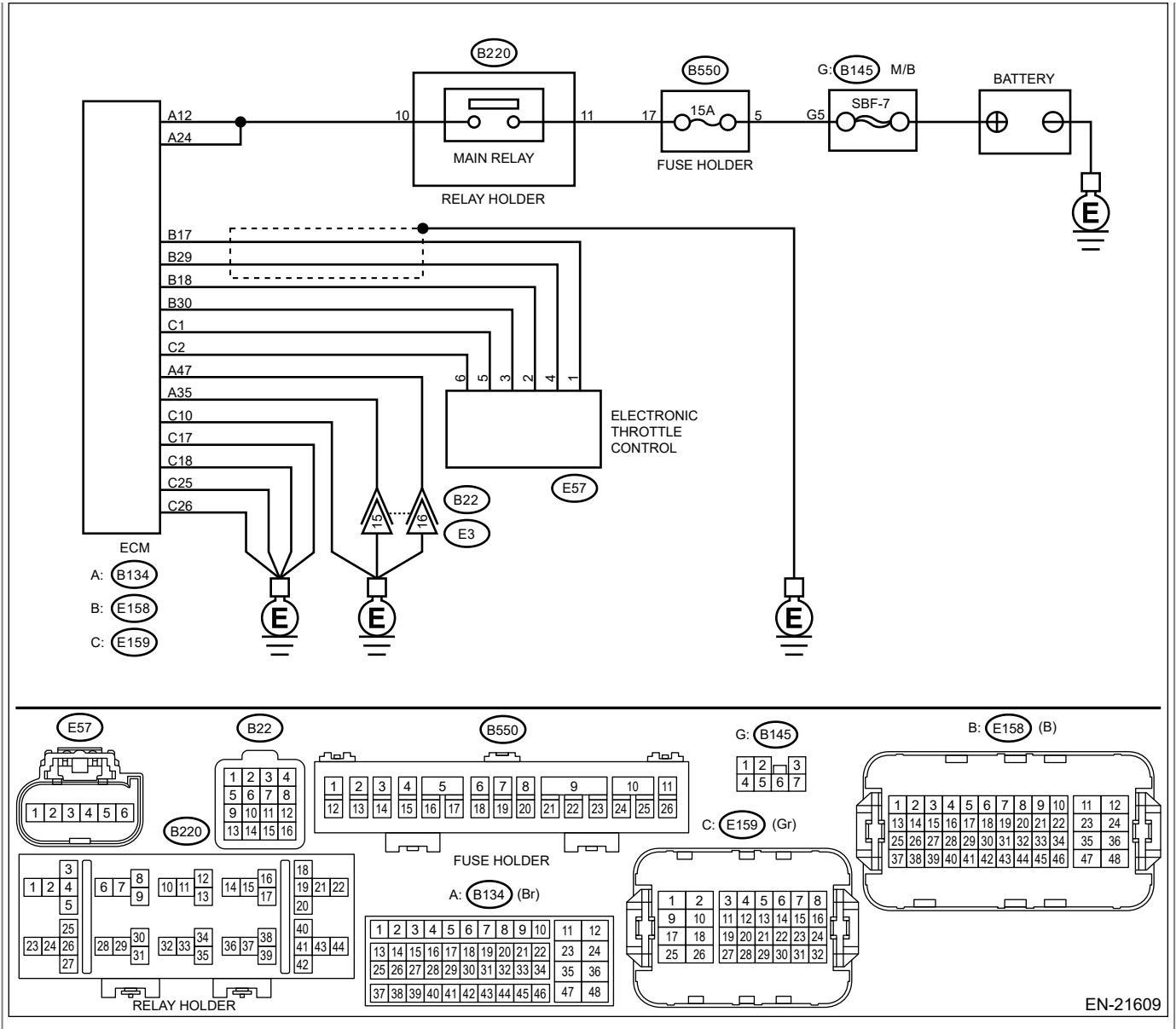
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode. and Inspection Mode !\[\]\(b3cfbfd04368a71f4c64e073908d25d7_img.jpg\) \[Ref. to ENGINE \\(DIAGNOSTICS\\)\\(H4DOTC\\)>Inspection Mode.\]\(#\)](#)**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





1. CHECK INPUT VOLTAGE OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and engine ground.

Connector & terminal

(B134) No. 12 (+) — Engine ground (-):

(B134) No. 24 (+) — Engine ground (-):

Is the voltage 10 — 13 V?

Yes

[Go to 2.](#)

No

Repair the open or short to ground in the power supply circuit.

2. CHECK INPUT VOLTAGE OF ECM.



1. Start the engine.
2. Measure the voltage between ECM and engine ground.


Connector & terminal

(B134) No. 12 (+) — Engine ground (-):

(B134) No. 24 (+) — Engine ground (-):

Is the voltage 13 — 15 V?

Yes

 [Go to 3.](#)

No

Repair the open or short to ground in the power supply circuit.

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connectors from electronic throttle control.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and electronic throttle control connector.


Connector & terminal

(E158) No. 18 — (E57) No. 2:

(E158) No. 30 — (E57) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Repair the open circuit of harness between ECM and electronic throttle control connector.

4. CHECK ECM GROUND HARNESS.



1. Connect all connectors.
2. Turn the ignition to ON.
3. Measure the voltage between ECM and engine ground.


Connector & terminal

(B134) No. 35 — Engine ground:

(B134) No. 47 — Engine ground:
 (E159) No. 10 — Engine ground:
 (E159) No. 17 — Engine ground:
 (E159) No. 18 — Engine ground:
 (E159) No. 25 — Engine ground:
 (E159) No. 26 — Engine ground:

Is the voltage less than 1 V?

Yes

Check the connector for poor contact and check the harness. Replace the ECM if no fault is found.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in ground circuit**
- **Loose engine ground terminal**
- **Poor contact of coupling connector**

1. OUTLINE OF DIAGNOSIS

Judge as NG when any one of the followings is established.

- (1) When the input amplifier circuit operation of throttle position sensor 1 is abnormal.
- (2) When the learning value of backup RAM is incorrect.
- (3) When SUM value of backup RAM is outside the standard value.
- (4) When the communication between main CPU and sub CPU is abnormal.
- (5) If the CPU operation is abnormal
- (6) If the CPU operation is abnormal (FPU check).

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
(1) ECM initialization	Execution
(2) Ignition switch	OFF → ON
(3) ECM initialization	Execution
(4) Battery voltage	≥ 6 V
(5) Battery voltage	≥ 6 V
(6) Battery voltage	≥ 6 V

3. GENERAL DRIVING CYCLE

- (1): Perform the diagnosis only once.
- (2): Always perform the diagnosis continuously.
- (3): Perform the diagnosis only once.
- (4): Always perform the diagnosis continuously.

(5): Always perform the diagnosis continuously.

(6): Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

Judge as NG if the criteria below are met.

Judgment value

Malfunction Criteria	Threshold Value
(1) Throttle minimum stop position	≥ 2.2 V
(2) The learned value of accelerator pedal position in back-up RAM area 1	\neq The learned value of accelerator pedal position in back-up RAM area 2
(3) The sum of back-up RAM at the ECM shut down	\neq The sum of back-up RAM at the ECM powered-on
(4) Communication between main CPU and sub CPU	Lost
(5) The calculated data of throttle control by main CPU	\neq The calculated data of throttle control by sub CPU
(6) The calculated data by main CPU	\neq The calculated data by FPU

Time needed for diagnosis:

(1): Less than 1 second

(2): Less than 1 second

(3): Less than 1 second

(4): Less than 1 second

(5): Less than 1 second

(6): 200 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P060A INTERNAL CONTROL MODULE MONITORING PROCESSOR PERFORMANCE

Note:

For the diagnostic procedure, refer to DTC P0606.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0606 CONTROL MODULE PROCESSOR.](#)

1. OUTLINE OF DIAGNOSIS

Judge as NG when the monitoring IC operation is abnormal.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

Judge as NG when one of the following conditions is established.

Judgment value

Malfunction Criteria	Threshold Value
Communication status between main CPU and sub CPU	Malfunction

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P060B INTERNAL CONTROL MODULE A/D PROCESSING PERFORMANCE

Note:

For the diagnostic procedure, refer to DTC P0606.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0606 CONTROL MODULE PROCESSOR.](#)

1. OUTLINE OF DIAGNOSIS

Judge as NG when the AD converter operation is abnormal.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 6\text{ V}$
A/D for control – A/D for monitoring	$\geq 0.5\text{ V}$

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

Judge as NG when one of the following conditions is established.

Judgment value

Malfunction Criteria	Threshold Value
Change amount of A/D for control	$\leq 0.2\text{ V}$
Change amount of A/D for monitoring	$\leq 0.2\text{ V}$

Time needed for diagnosis: 200 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)



DTC P0616 STARTER RELAY "A" CIRCUIT LOW

1. MODEL WITHOUT PUSH BUTTON START

DTC detecting condition:

Immediately at fault recognition

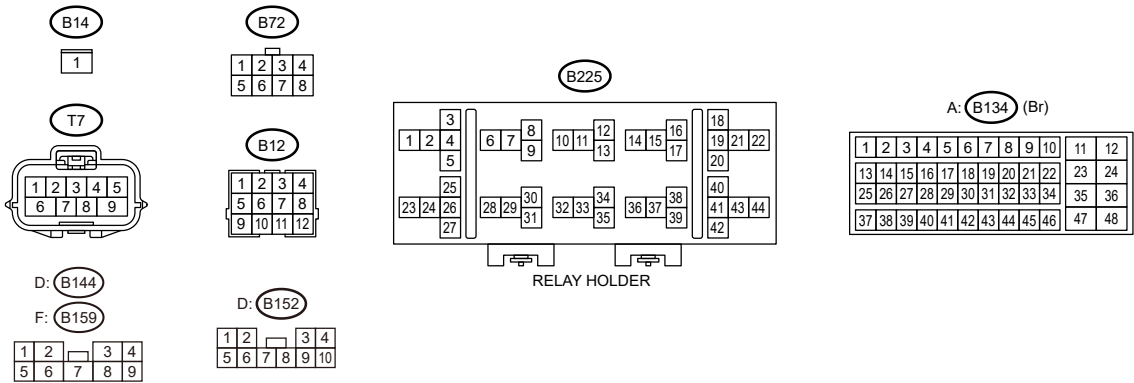
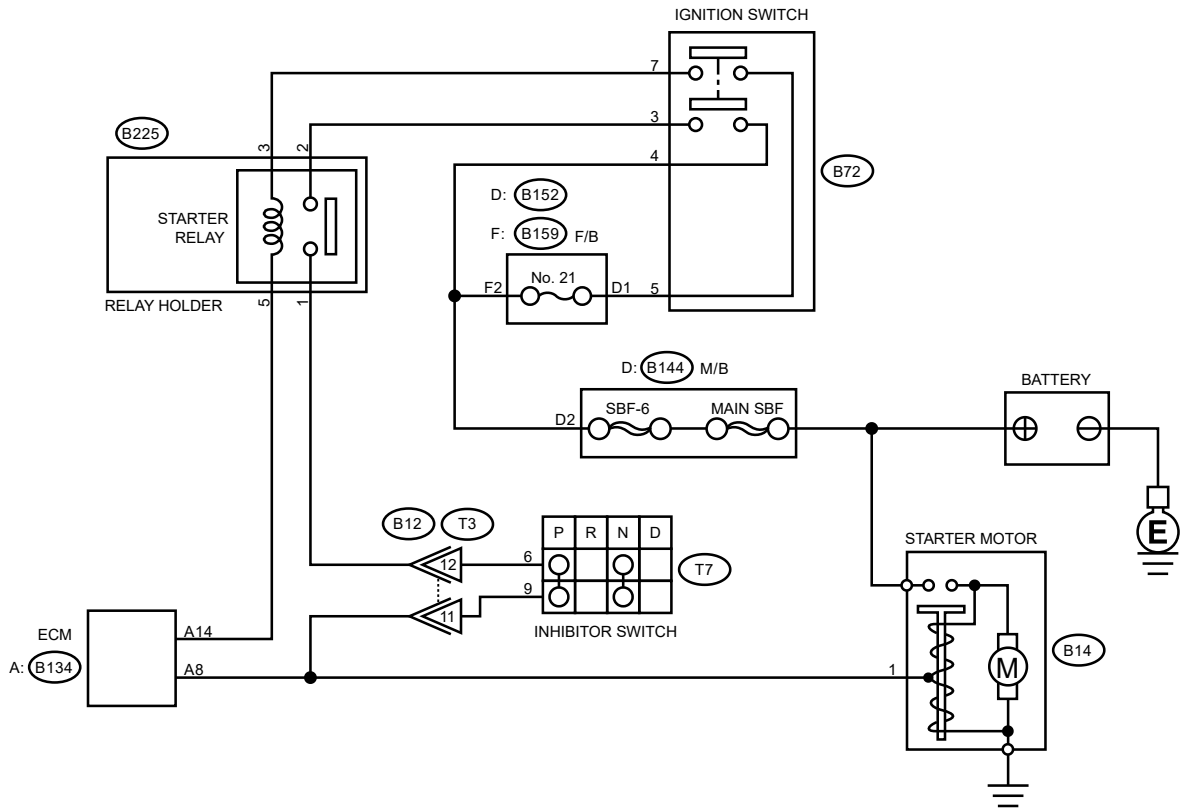
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21613

1. CHECK FOR ANY OTHER DTC ON DISPLAY.



Is any other DTC displayed?

Yes

Check DTC using "List of Diagnostic Trouble Code (DTC)". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND STARTER RELAY CONNECTOR.



1. Turn the ignition switch to OFF.
2. Remove the starter relay.
3. Disconnect the connector from starter motor.
4. Disconnect the connector from ECM.
5. Measure the resistance of harness between ECM and starter relay connector.

Connector & terminal


(B134) No. 8 — (B225) No. 1:

Note:

Place the select lever in "P" range or "N" range.

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Note:

Check the following item and repair or replace if necessary.

- Open circuit of harness between ECM and starter relay connector
- Poor contact of coupling connector

3. CHECK HARNESS BETWEEN ECM AND STARTER RELAY CONNECTOR.



Measure the resistance between ECM and chassis ground.

Connector & terminal

(B134) No. 8 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

Repair the poor contact of ECM connector.

No

Repair the short circuit to ground in harness between ECM and starter relay connector.



2. MODEL WITH PUSH BUTTON START

Immediately at fault recognition


Trouble symptom:

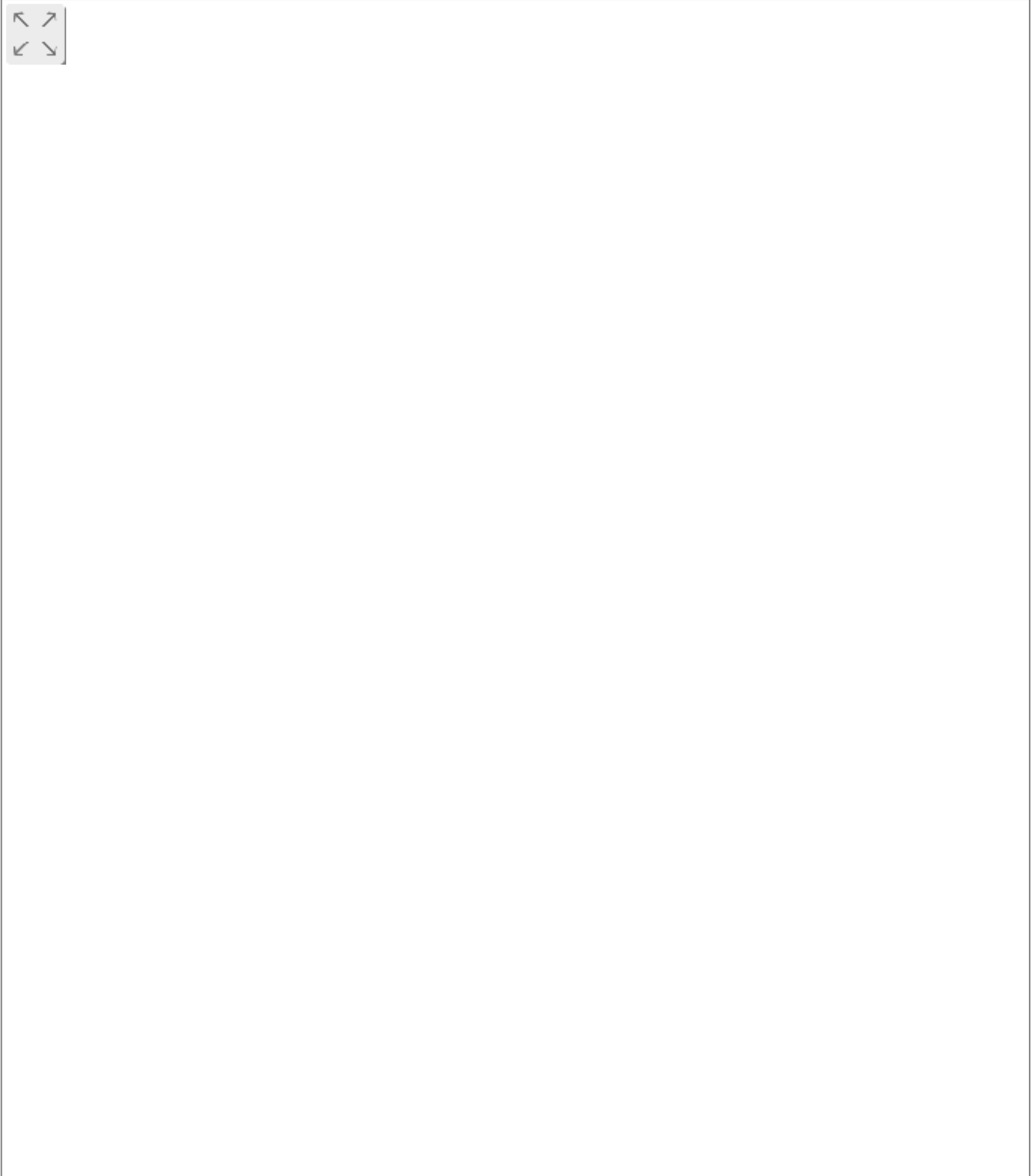
Failure of engine to start

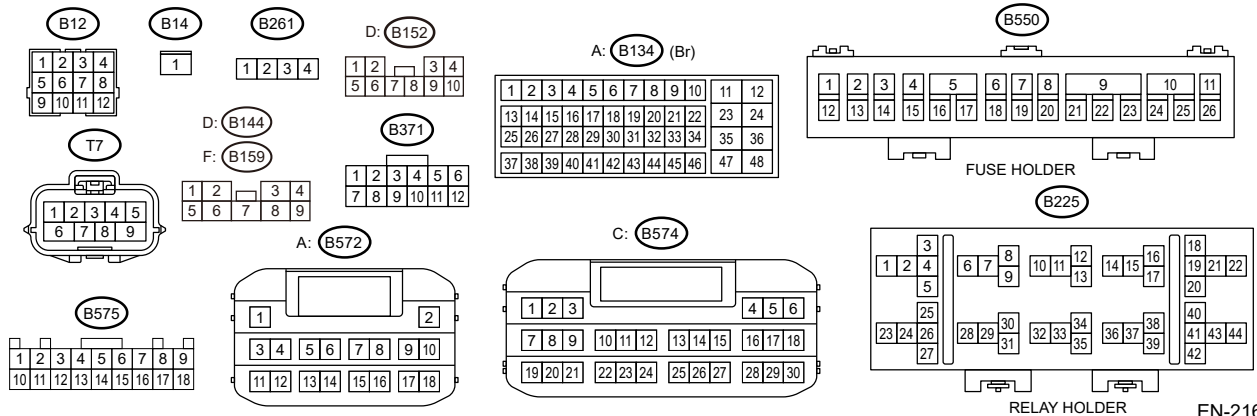
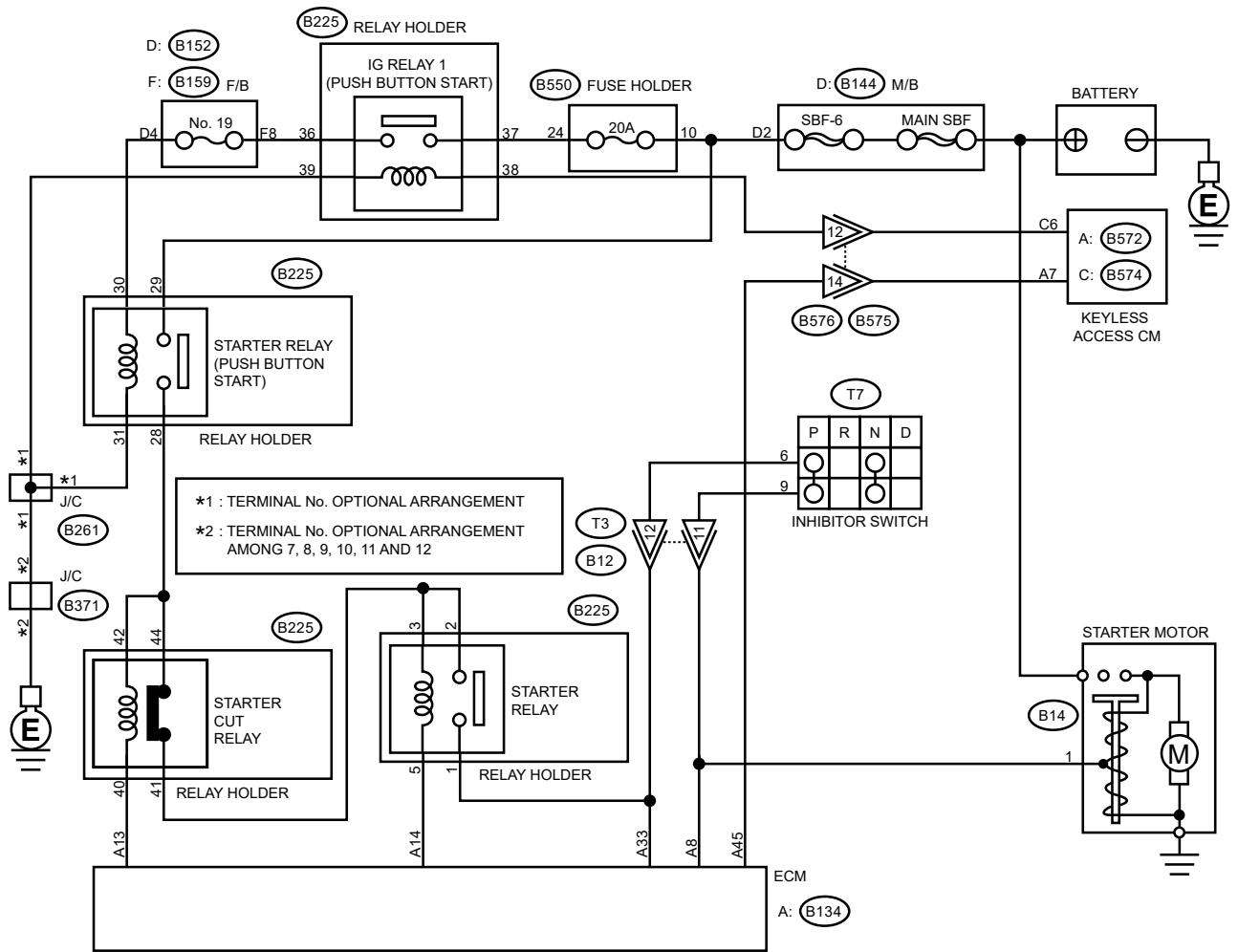
Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE.

Wiring diagram:

Engine Electrical System TURBO MODEL (WITH PUSH BUTTON START)  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM > TURBO MODEL (WITH PUSH BUTTON START).





1. CHECK HARNESS BETWEEN ECM AND STARTER RELAY CONNECTOR.

1. Turn the ignition to OFF.
2. Disconnect the connector from ECM.
3. Remove the starter relay.
4. Measure the resistance of harness between ECM and starter relay connector.

Note:

Place the select lever in "P" range or "N" range.

Connector & terminal

(B134) No. 8 — (B225) No. 1:

Is the resistance less than 1 Ω?

Yes

 [Go to 2.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM and starter relay connector**
- **Poor contact of coupling connector**

2. CHECK HARNESS BETWEEN ECM AND STARTER RELAY CONNECTOR.



1. Disconnect the connector from starter motor.
2. Measure the resistance between ECM and engine ground.

Connector & terminal

(B134) No. 8 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

Repair the poor contact of ECM connector.

No

Repair the short circuit to ground in harness between ECM and starter relay connector.

3. OUTLINE OF DIAGNOSIS

Detect abnormal continuity in the starter SW 2.

Judge as OFF NG when the starter SW 2 signal remains OFF.

4. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 8 V
Vehicle speed	< 1 km/h (0.6 MPH)
Engine speed	Increases from 0 rpm to 500 rpm or more

Starter relay	ON
---------------	----

5. GENERAL DRIVING CYCLE

Perform the diagnosis only once after starting the engine.

6. DIAGNOSTIC METHOD

Judge as OFF NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Starter SW2 signal of 6 V or more	Not detected

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0617 STARTER RELAY "A" CIRCUIT HIGH

1. MODEL WITHOUT PUSH BUTTON START



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

Failure of engine to start

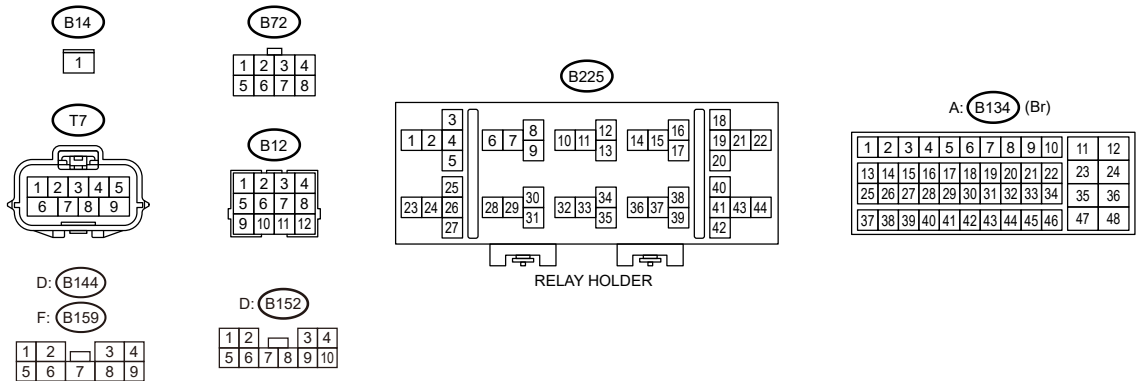
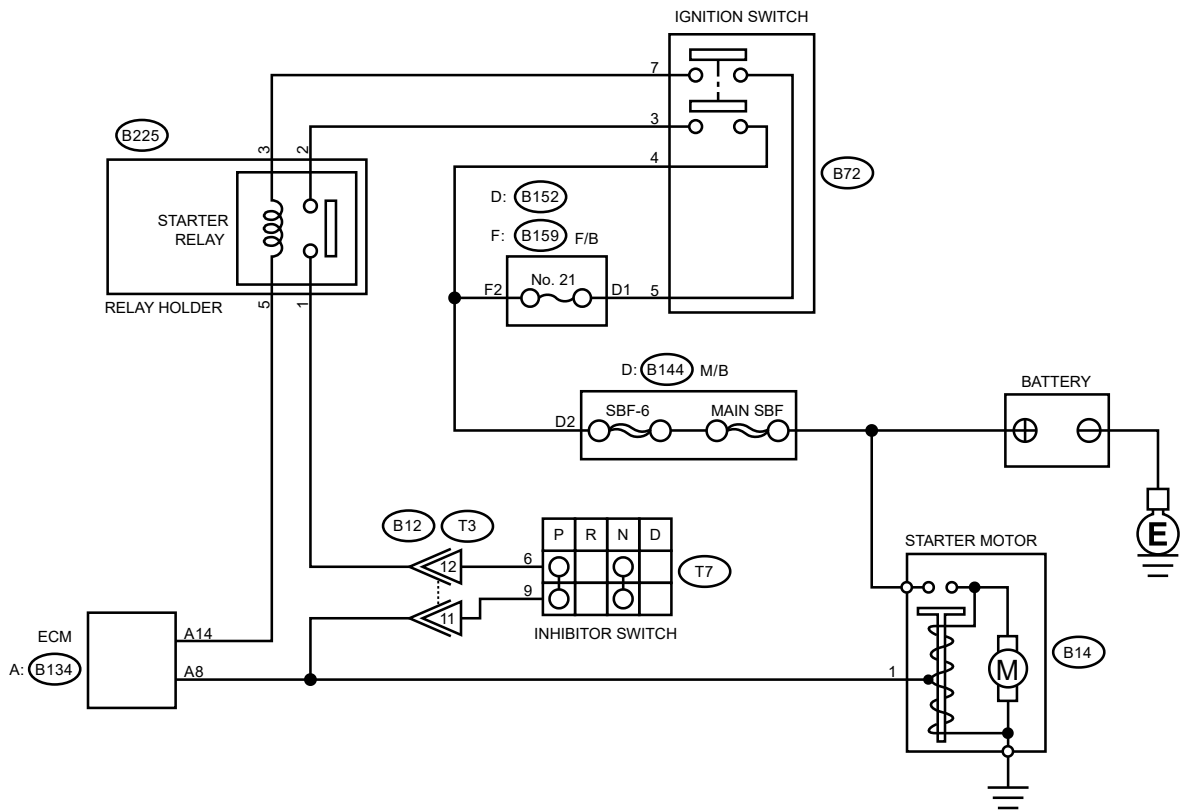
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21613

1. CHECK FOR ANY OTHER DTC ON DISPLAY.



Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".

[Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND STARTER RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Turn the ignition switch to ON.
4. Measure the voltage between ECM and chassis ground.

Connector & terminal

(B134) No. 8 (+) — Chassis ground (-):

Note:

Place the select lever in "P" range or "N" range.

Is the voltage 10 V or more?

Yes

Repair the short circuit to power supply in harness between ECM and starter relay connector.

No

Repair the poor contact of ECM connector.

2. MODEL WITH PUSH BUTTON START



DTC detecting condition:

Immediately at fault recognition


Trouble symptom:

Failure of engine to start

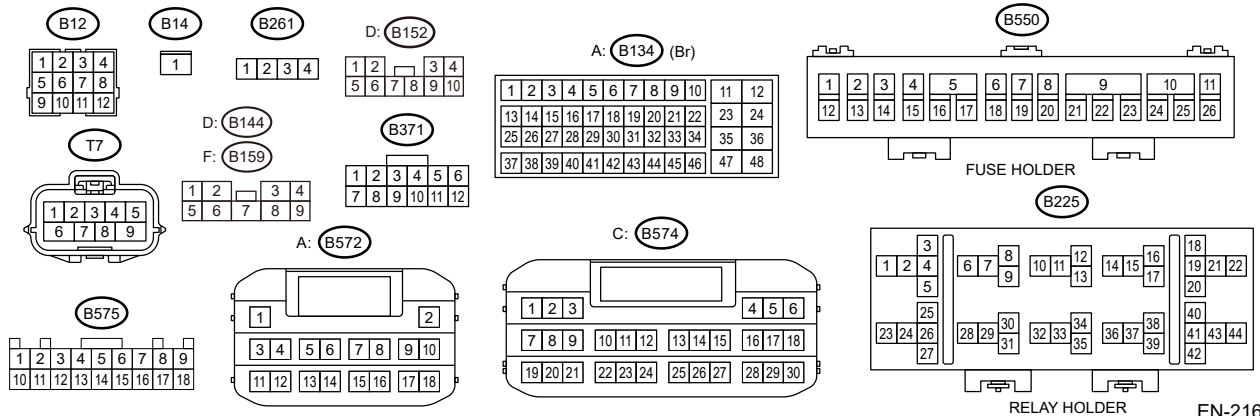
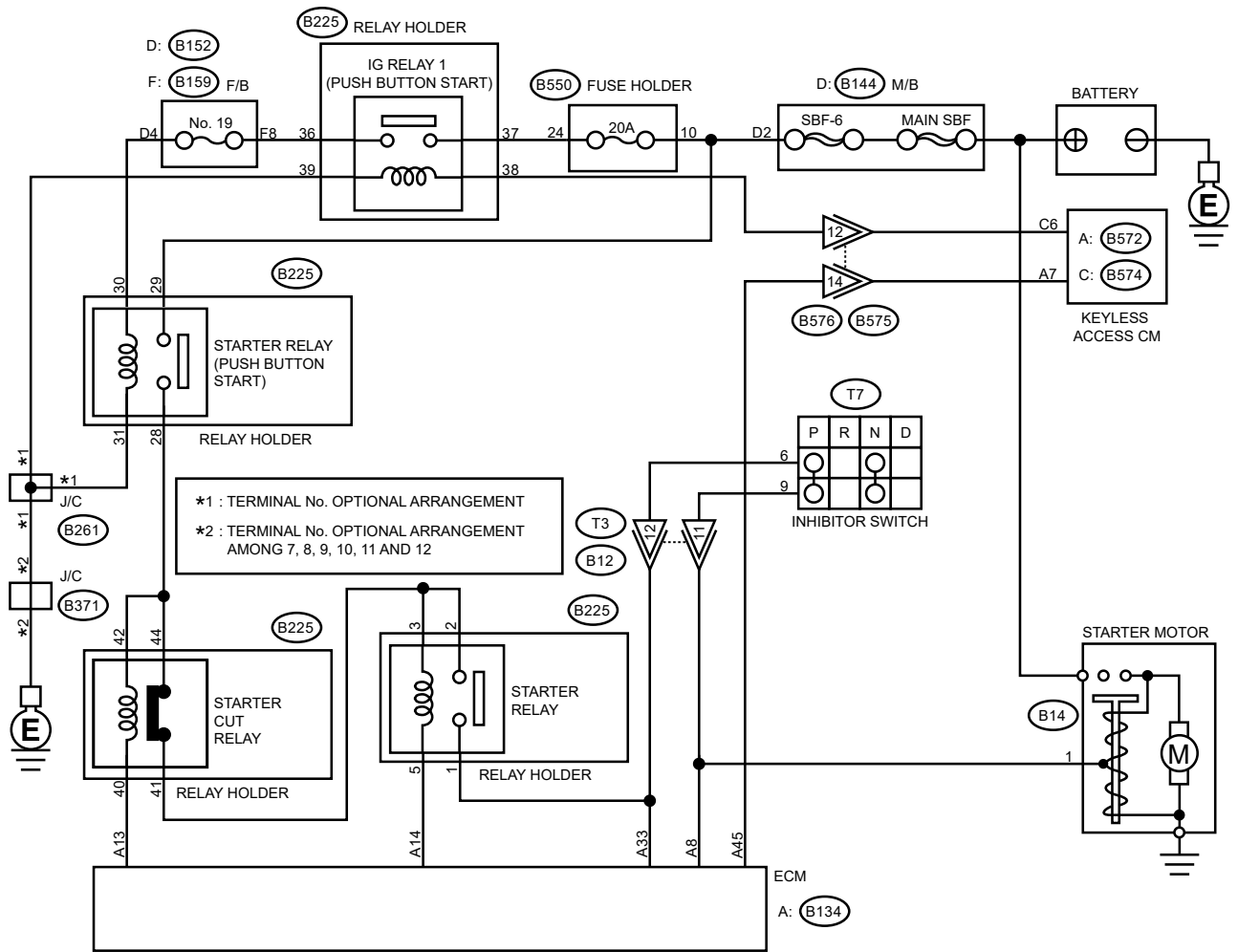
Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

Wiring diagram:

Engine Electrical System TURBO MODEL (WITH PUSH BUTTON START)  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM > TURBO MODEL (WITH PUSH BUTTON START).





RELAY HOLDER EN-21614

1. CHECK STARTER MOTOR.

1. Turn the ignition to ON.
2. Check the starter motor condition.

Is the starter motor rotating?

Yes

[Go to 2.](#)

No

Repair the short circuit to power supply in harness.

Note:

In this case, repair the following harnesses:

- Short circuit to power supply in harness between ECM and starter relay connector
- Short circuit to power supply in harness between ECM and starter motor
- Short circuit to power supply in harness between starter relay connector and starter motor

2. CHECK HARNESS BETWEEN STARTER CUT RELAY CONNECTOR AND STARTER RELAY CONNECTOR.

1. Turn the ignition to OFF.
2. Disconnect the connector from starter motor.
3. Remove the starter relay.
4. Remove the starter cut relay.
5. Turn the ignition to ON.
6. Measure the voltage between starter relay connector and chassis ground.

Connector & terminal

(B225) No. 2 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power supply in harness between starter cut relay connector and starter relay connector.

No

 [Go to 3.](#)

3. CHECK STARTER CUT RELAY.

1. Connect the battery to starter cut relay terminals No. 40 and No. 42.
2. Measure the resistance between starter cut relay terminals.

Terminals


No. 41 — No. 44:

Is the resistance 1 M Ω or more?

Yes

 [Go to 6.](#)

No

Replace the starter cut relay.  [Ref. to SECURITY AND LOCKS>Starter Cut Relay.](#)

 [Go to 4.](#)

4. CHECK HARNESS BETWEEN ECM AND STARTER RELAY CONNECTOR.




1. Disconnect the connector from ECM.
2. Measure the resistance between ECM and engine ground.

Connector & terminal

(B134) No. 14 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM and starter relay connector.

5. CHECK STARTER RELAY.



Measure the resistance between starter relay terminals.

Terminals

No. 1 — No. 2:

Is the resistance 1 MΩ or more?

Yes

 [Go to 6.](#)

No

Replace the starter relay.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Electrical Component Location>LOCATION.](#)

6. CHECK HARNESS BETWEEN ECM, STARTER RELAY CONNECTOR AND STARTER MOTOR.



1. Disconnect the connector from ECM.
2. Turn the ignition to ON.
3. Measure the voltage between ECM and engine ground.

Connector & terminal

(B134) No. 8 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power supply in harness.

Note:

In this case, repair the following harnesses:

- Short circuit to power supply in harness between ECM and starter relay connector
- Short circuit to power supply in harness between ECM and starter motor
- Short circuit to power supply in harness between starter relay connector and starter motor

No

Repair the poor contact of ECM connector.

3. OUTLINE OF DIAGNOSIS

Detect abnormal continuity in the starter SW 2.

Judge as ON NG when the starter SW 2 signal remains ON.

4. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 8 \text{ V}$
Engine speed	$\geq 475 \text{ rpm}$
Starter relay	OFF

5. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after starting the engine.

6. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Starter SW2 signal	$\geq 6 \text{ V}$

Time needed for diagnosis: 30 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P062D FUEL INJECTOR DRIVER CIRCUIT PERFORMANCE BANK 1



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Engine does not start.
- Engine stalls.

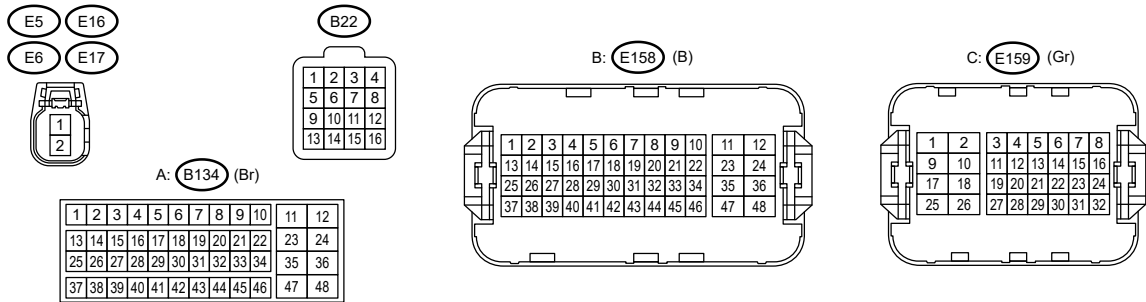
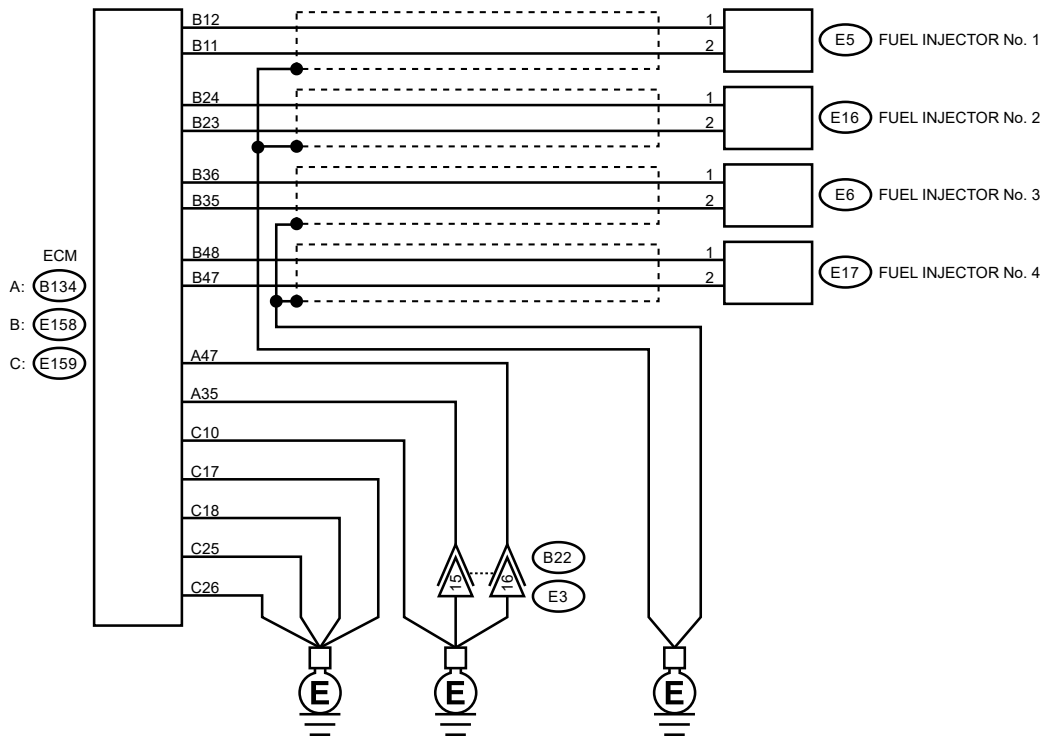
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21237

1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".

[Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.

Connector & terminal

- #1 (E158) No. 11 — (E158) No. 12:
- #2 (E158) No. 23 — (E158) No. 24:
- #3 (E158) No. 35 — (E158) No. 36:
- #4 (E158) No. 47 — (E158) No. 48:

Is the resistance 1.89 — 2.31 Ω (at 20°C (68°F))?

Yes

 [Go to 4.](#)

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

1. Disconnect the connector from fuel injector.
2. Measure the resistance of harness between ECM connector and defective fuel injector connector.


Connector & terminal

- #1 (E158) No. 12 — (E5) No. 1:
- #1 (E158) No. 11 — (E5) No. 2:
- #2 (E158) No. 24 — (E16) No. 1:
- #2 (E158) No. 23 — (E16) No. 2:
- #3 (E158) No. 36 — (E6) No. 1:
- #3 (E158) No. 35 — (E6) No. 2:
- #4 (E158) No. 48 — (E17) No. 1:
- #4 (E158) No. 47 — (E17) No. 2:

Is the resistance less than 1 Ω ?

Yes

Repair or replace the following items.

- Poor contact of fuel injector connector
- Defective fuel injector  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Injector.](#)

No

Repair the open circuit of the harness between the ECM connector and fuel injector connector.

4. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

Measure the resistance between the ECM connector and engine ground.

Connector & terminal


- #1 (E158) No. 12 — Engine ground:
- #1 (E158) No. 11 — Engine ground:
- #2 (E158) No. 24 — Engine ground:
- #2 (E158) No. 23 — Engine ground:
- #3 (E158) No. 36 — Engine ground:
- #3 (E158) No. 35 — Engine ground:
- #4 (E158) No. 48 — Engine ground:
- #4 (E158) No. 47 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

Repair the poor contact of ECM connector.

No

 [Go to 5.](#)

5. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.




1. Disconnect the connector from fuel injector.
2. Measure the resistance between ECM connector and engine ground on defective fuel injectors.

Connector & terminal

- #1 (E158) No. 12 — Engine ground:
- #1 (E158) No. 11 — Engine ground:
- #2 (E158) No. 24 — Engine ground:
- #2 (E158) No. 23 — Engine ground:
- #3 (E158) No. 36 — Engine ground:
- #3 (E158) No. 35 — Engine ground:
- #4 (E158) No. 48 — Engine ground:
- #4 (E158) No. 47 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

Replace the faulty fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Injector.](#)

No

Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of fuel injector circuit function.

Judge as NG when ECM with two fuel injectors or more detects any malfunction in the diagnostic items listed below.

Diagnostic item	Malfunction Criteria
Overcurrent	Fuel injector current is high.
Low current	Fuel injector current is low.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 9.4 V
Engine speed	> 0 rpm
Fuel cut	Not performed

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

DIAGNOSIS FOR OVERCURRENT

Judgment value

Malfunction Criteria	Threshold Value
Fuel injector current	≥ 18A

LOW CURRENT DIAGNOSIS

Judgment value

Malfunction Criteria	Threshold Value
Fuel injector current	≤ 8.8 A

Time needed for diagnosis: TDC × 50 times

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P062F INTERNAL CONTROL MODULE EEPROM ERROR

Note:

For the diagnostic procedure, refer to DTC P0606.  Ref. to [ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0606 CONTROL MODULE PROCESSOR.](#)

1. OUTLINE OF DIAGNOSIS

Judge as NG when the EEPROM operation is abnormal.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

3. GENERAL DRIVING CYCLE

Perform the diagnosis during self shut.

4. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Writing result to EEPROM	Malfunction

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.


ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0685 ECM/PCM POWER RELAY CONTROL CIRCUIT/OPEN

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

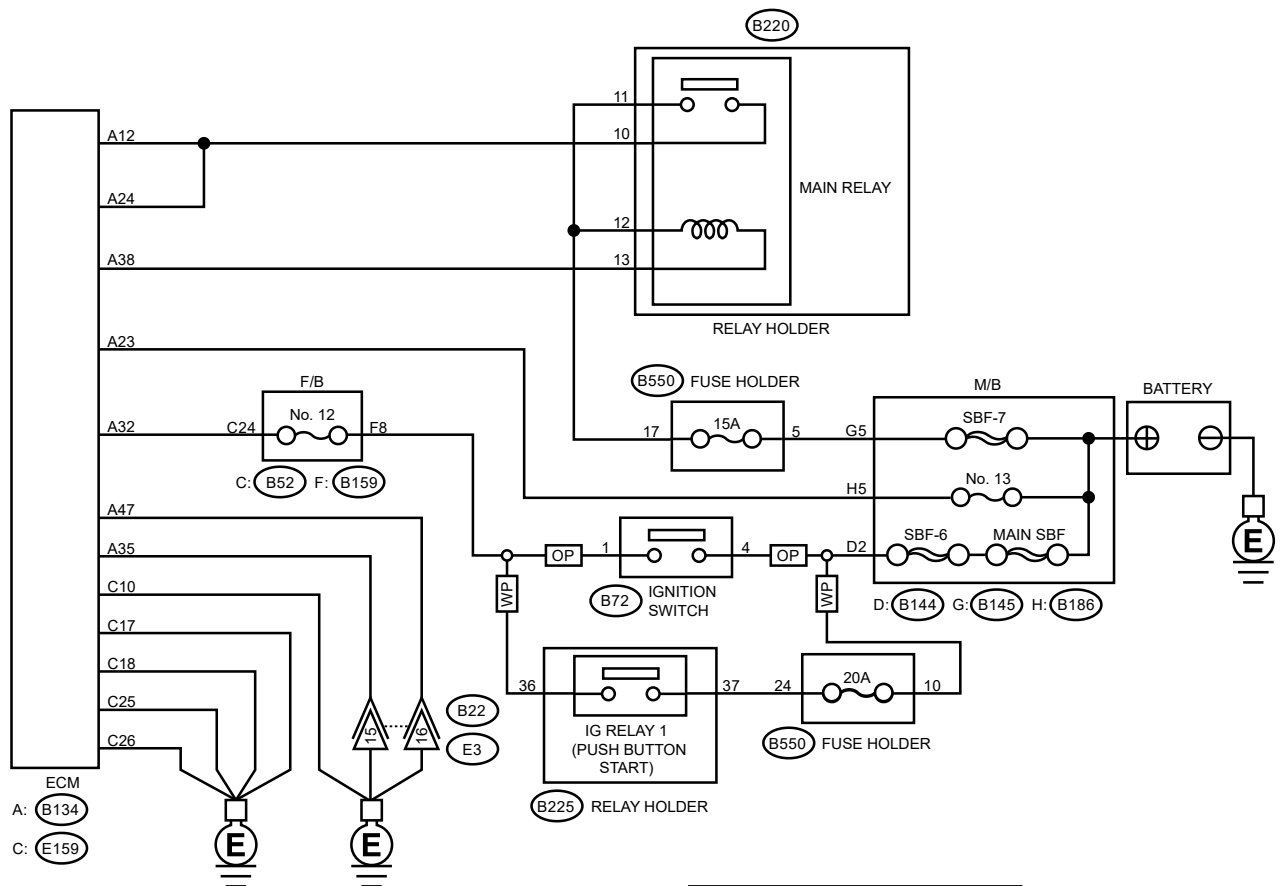
Caution:

- After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode. and Inspection Mode !\[\]\(e0657301a840725a62b5d9c03de7d165_img.jpg\) Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

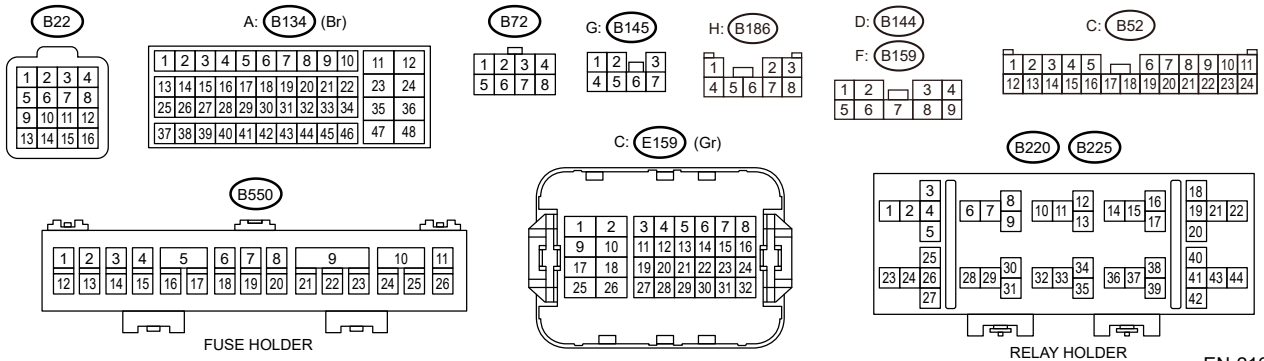
Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





OP : WITHOUT PUSH BUTTON START
 WP : WITH PUSH BUTTON START



EN-21611

1. CHECK ECM CONNECTOR.

Check the connecting condition of ECM connector.

Is the ECM connector correctly connected?

Yes

Go to 2.

No

Connect the ECM connector correctly.

2. CHECK HARNESS BETWEEN ECM AND MAIN RELAY CONNECTOR.


1. Turn the ignition switch to OFF.
2. Remove the main relay.
3. Disconnect the connector from ECM.
4. Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(B134) No. 38 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 3.](#)

No

Repair the short circuit to ground in harness between ECM connector and main relay connector.

3. CHECK HARNESS BETWEEN ECM AND MAIN RELAY CONNECTOR.

1. Install the main relay.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and engine ground.

Connector & terminal

(B134) No. 12 (+) — Engine ground (-):

(B134) No. 24 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

repair the harness and connector.

Note:

In this case, repair the following item:

- **Short circuit to power supply in harness between ECM connector and main relay connector**
- **Defective main relay**

No

Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Detect the main relay stuck to ON.

Judge as NG when ECM keeps operating for more than predetermined time although the main relay does not turn to OFF after ignition switch is turned to OFF.

2. COMPONENT DESCRIPTION

The main relay controls the current in the coil section to switch ON/OFF the ECM by receiving instructions from the ignition switch and Evaporative Leak Check Module.

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Main relay	OFF instruction

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once when the following driving cycle starts after the ignition switch is OFF.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
ECM status	In operation

Time needed for diagnosis: 2.5 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0700 TRANSMISSION CONTROL SYSTEM (MIL REQUEST)

Note:

For the diagnostic procedure, refer to CVT section.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS

Judge as NG when there is CAN communication with the TCM and there is a MIL lighting request.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
MIL lighting request from TCM	Yes

Time needed for diagnosis: 2560 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P081A STARTER DISABLE CIRCUIT LOW



DTC detecting condition:

Immediately at fault recognition


Trouble symptom:

Failure of engine to start

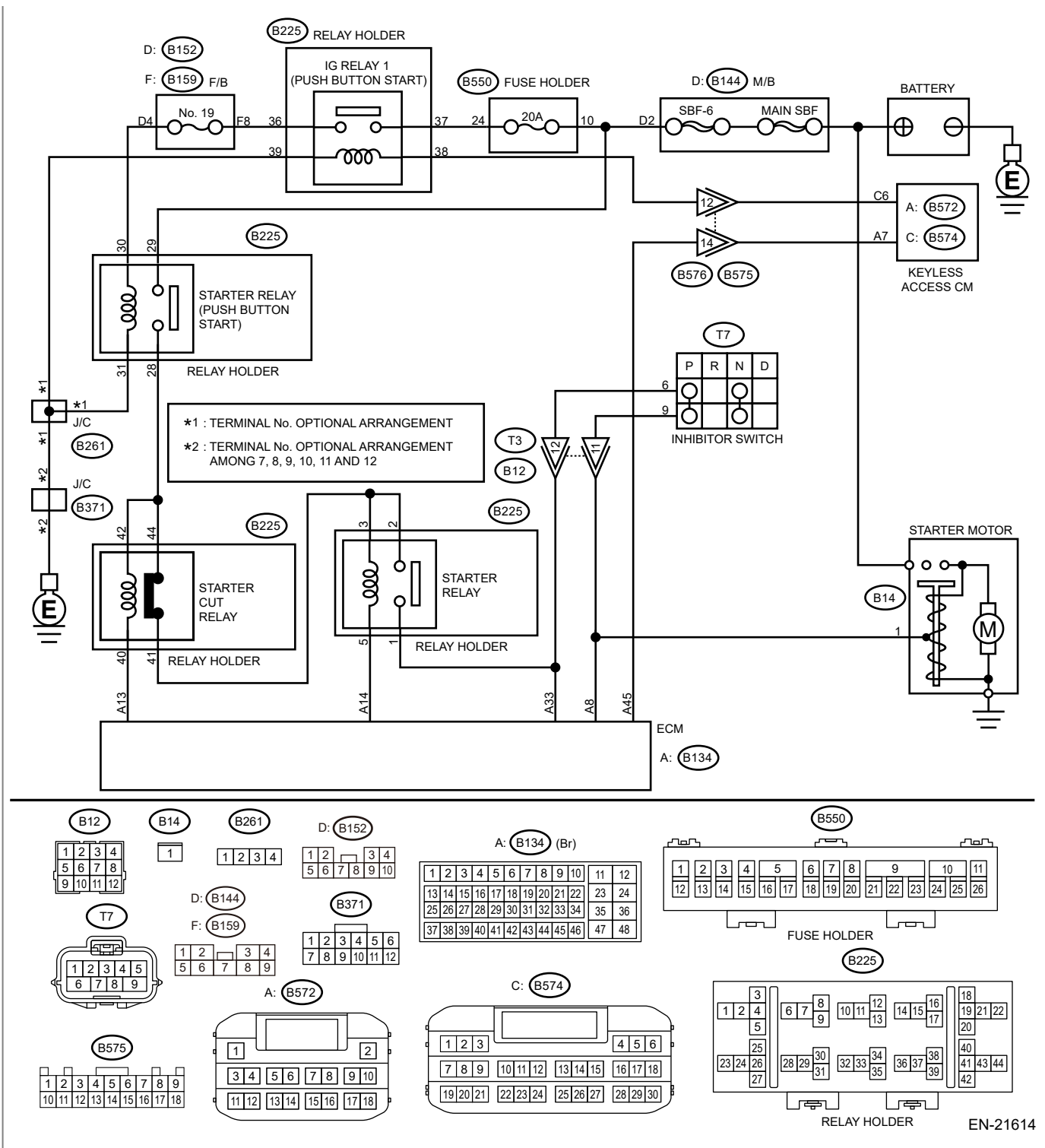
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System TURBO MODEL (WITH PUSH BUTTON START)  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM > TURBO MODEL \(WITH PUSH BUTTON START\).](#)





1. CHECK HARNESS BETWEEN STARTER RELAY (PUSH BUTTON START) CONNECTOR AND STARTER CUT RELAY CONNECTOR.

1. Turn the ignition to OFF.
2. Remove the starter cut relay.
3. Remove the starter relay (push button start).




- 4.** Measure the resistance of harness between starter relay (push button start) connector and starter cut relay connector.

Connector & terminal

(B225) No. 28 — (B225) No. 42:

Is the resistance less than 1 Ω ?

Yes

 [Go to 2.](#)

No

Repair the open circuit in harness between starter relay (push button start) connector and starter cut relay connector.

2. CHECK HARNESS BETWEEN ECM AND STARTER CUT RELAY CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM and starter cut relay connector.

Connector & terminal

(B134) No. 13 — (B225) No. 40:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit of harness between ECM and starter cut relay connector.

3. CHECK STARTER CUT RELAY.

1. Connect the battery to starter cut relay terminals No. 40 and No. 42.
2. Measure the resistance between starter cut relay terminals.

Terminals


No. 41 — No. 44:

Is the resistance 1 M Ω or more?

Yes

Repair the poor contact of ECM connector.

No

Replace the starter cut relay.  [Ref. to SECURITY AND LOCKS>Starter Cut Relay.](#)

1. OUTLINE OF DIAGNOSIS

Detect abnormal continuity in the starter cut relay.

Judge as NG when the starter cut relay output line is open.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 8 \text{ V}$
Vehicle speed	$< 1 \text{ km/h (0.6 MPH)}$
Engine speed	Increases from 0 rpm to 500 rpm or more
Starter cut relay	OFF

3. GENERAL DRIVING CYCLE

Perform the diagnosis only once when the engine condition is turned from before starting to after starting.

4. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Starter cut relay control signal that exceeds 3.2 V	Not detected

Time needed for diagnosis: 640 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0851 PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

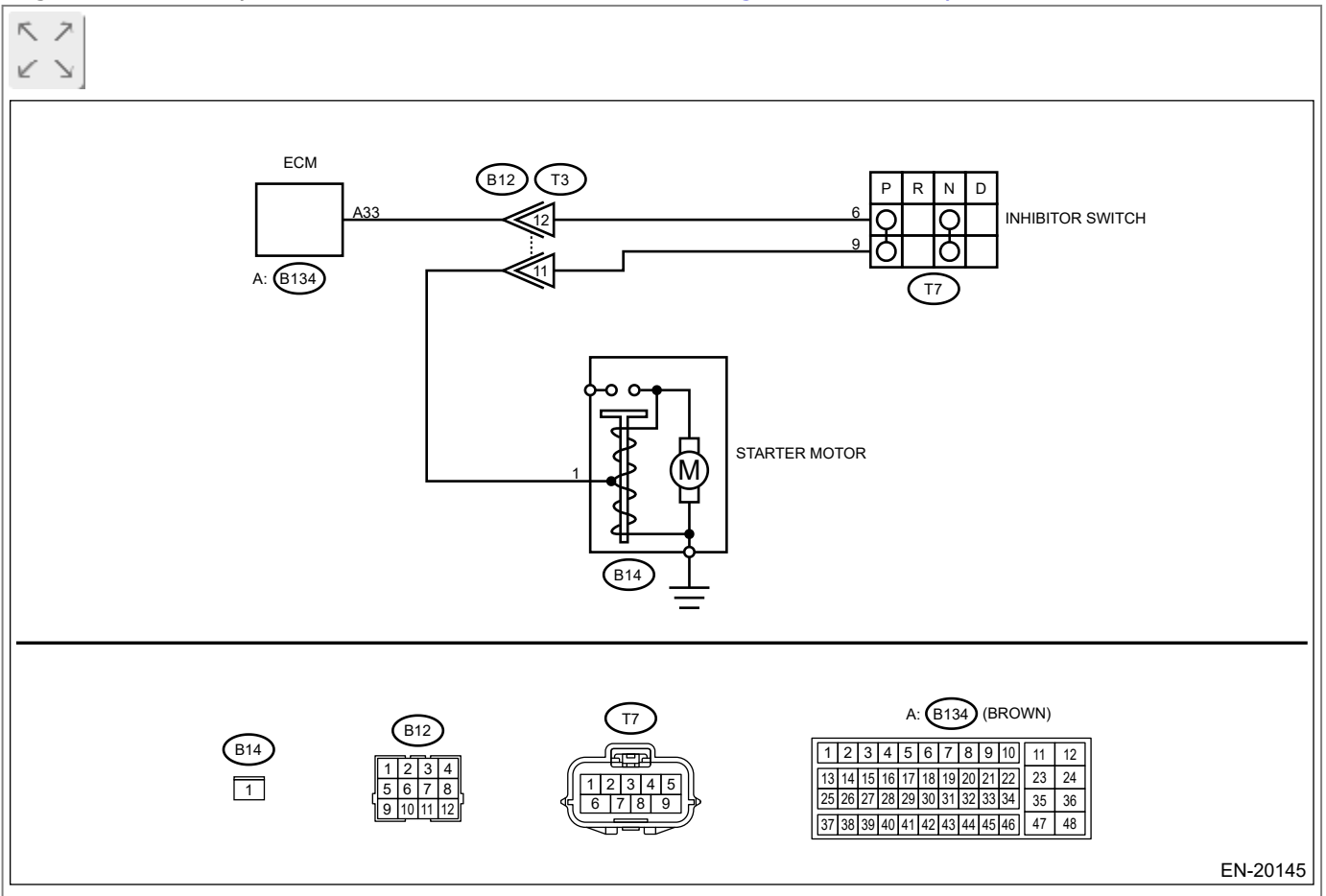
Improper idling

Caution:

- After servicing or replacing faulty parts, perform Clear Memory Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK SELECT CABLE.


Is there any fault in select cable?

Yes

Repair or adjust the select cable. Ref. to CONTROL SYSTEMS>Select

[Cable.](#)

No

 [Go to 2.](#)

2. CHECK INPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Place the select lever in other than "P" range and "N" range.
3. Measure the voltage between ECM and engine ground.

Connector & terminal


(B134) No. 33 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

Repair the poor contact of ECM connector.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND TRANSMISSION HARNESS CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from the transmission harness connector (T3).
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM and engine ground.

Connector & terminal

(B134) No. 33 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair the ground short circuit of harness between ECM and transmission harness connector.

4. CHECK TRANSMISSION HARNESS CONNECTOR.

1. Disconnect the connector from inhibitor switch.
2. Measure the resistance between transmission harness connector and engine ground.

Connector & terminal

(T3) No. 12 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

Replace the inhibitor switch.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Inhibitor Switch.](#)

No

Repair short circuit to ground in harness between transmission harness connector and inhibitor switch connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of neutral SW.

Judge as NG when the ECM neutral terminal input differs from the reception data from TCM.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Starter relay feedback voltage	< 1.5 V
Data received from TCM	≠ "P" range/"N" range

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously in 2 seconds after starting the engine.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Neutral position switch voltage	≤ 1 V

Time needed for diagnosis: 80 ms × 80 time(s)

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0852 PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

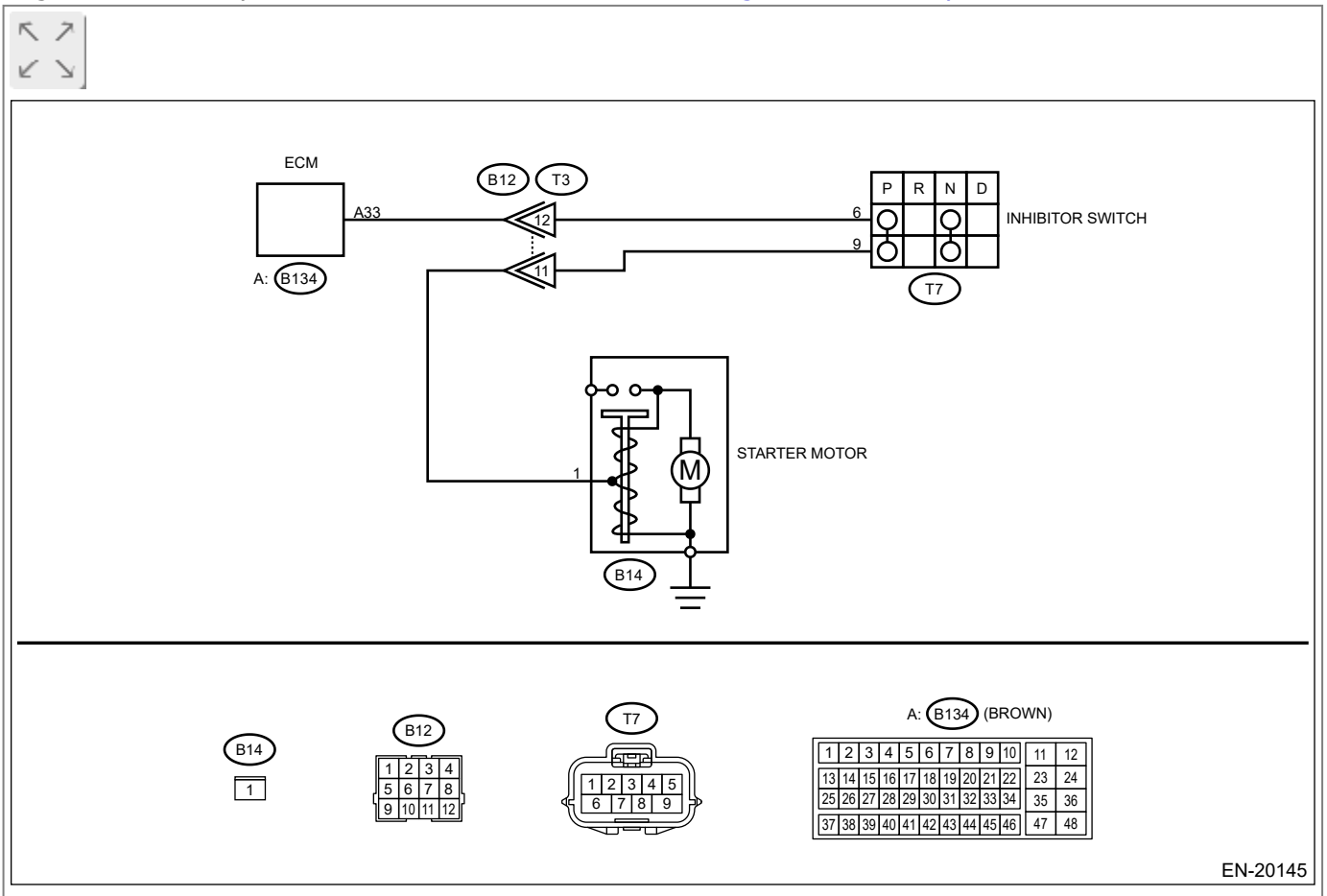
Improper idling

Caution:

- After servicing or replacing faulty parts, perform Clear Memory Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK SELECT CABLE.


Is there any fault in select cable?

Yes

Repair or adjust the select cable. Ref. to CONTROL SYSTEMS>Select

[Cable.](#)

No

 [Go to 2.](#)

2. CHECK INPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and engine ground with select lever at "P" range and "N" range.

Connector & terminal

(B134) No. 33 (+) — Engine ground (–):

Is the voltage less than 1 V?

Yes

Repair the poor contact of ECM connector.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from inhibitor switch.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and inhibitor switch connector.

Connector & terminal

(B134) No. 33 — (T7) No. 6:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and inhibitor switch connector**
- **Poor contact of coupling connector**

4. CHECK INHIBITOR SWITCH GROUND LINE.


Measure the resistance of harness between inhibitor switch connector and engine ground.

Connector & terminal

(T7) No. 9 – Engine ground:

Is the resistance less than 5 Ω ?

Yes

Replace the inhibitor switch.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Inhibitor Switch.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- Open circuit of harness between inhibitor switch connector and starter motor ground line
- Poor contact of coupling connector
- Poor contact of starter motor connector
- Poor contact of starter motor ground
- Starter motor

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of neutral SW.

Judge as NG when the ECM neutral terminal input differs from the reception data from TCM.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Starter relay feedback voltage	< 1.5 V
Data received from TCM	= "P" range/"N" range

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously in 2 seconds after starting the engine.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Neutral position switch voltage	≥ 6.6 V

Time needed for diagnosis: 80 ms \times 80 time(s)

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1134 A/F / O2 SENSOR BANK1 SENSOR1 SERIAL PERIPHERAL INTERFACE (SPI) COMMUNICATION

DTC detecting condition:

Immediately at fault recognition


Caution:

After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode>OPERATION.](#) and Inspection Mode  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode>PROCEDURE.](#)


1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

1. OUTLINE OF DIAGNOSIS

Judge as NG when the A/F sensor microcomputer operation is abnormal.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Communication status between CPU and A/F sensor microcomputer	Malfunction


Time needed for diagnosis: 80 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1160 THROTTLE RETURN SPRING

Note:

For the diagnostic procedure, refer to DTC P2101.  Ref. to [ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P2101 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE.](#)

1. OUTLINE OF DIAGNOSIS

Judge as NG when the throttle opening angle is out of specified value with ignition switch OFF.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Ignition switch	OFF
Continuous time when throttle motor control duty is 0%	= 7.82 s

3. GENERAL DRIVING CYCLE

Perform the diagnosis when the ignition switch is turned from ON to OFF.

4. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Throttle valve opening angle	< 13.9% or > 20.6%

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1191 FUEL RAIL PRESSURE SENSOR "A" CIRCUIT NO ACTIVITY DETECTED



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

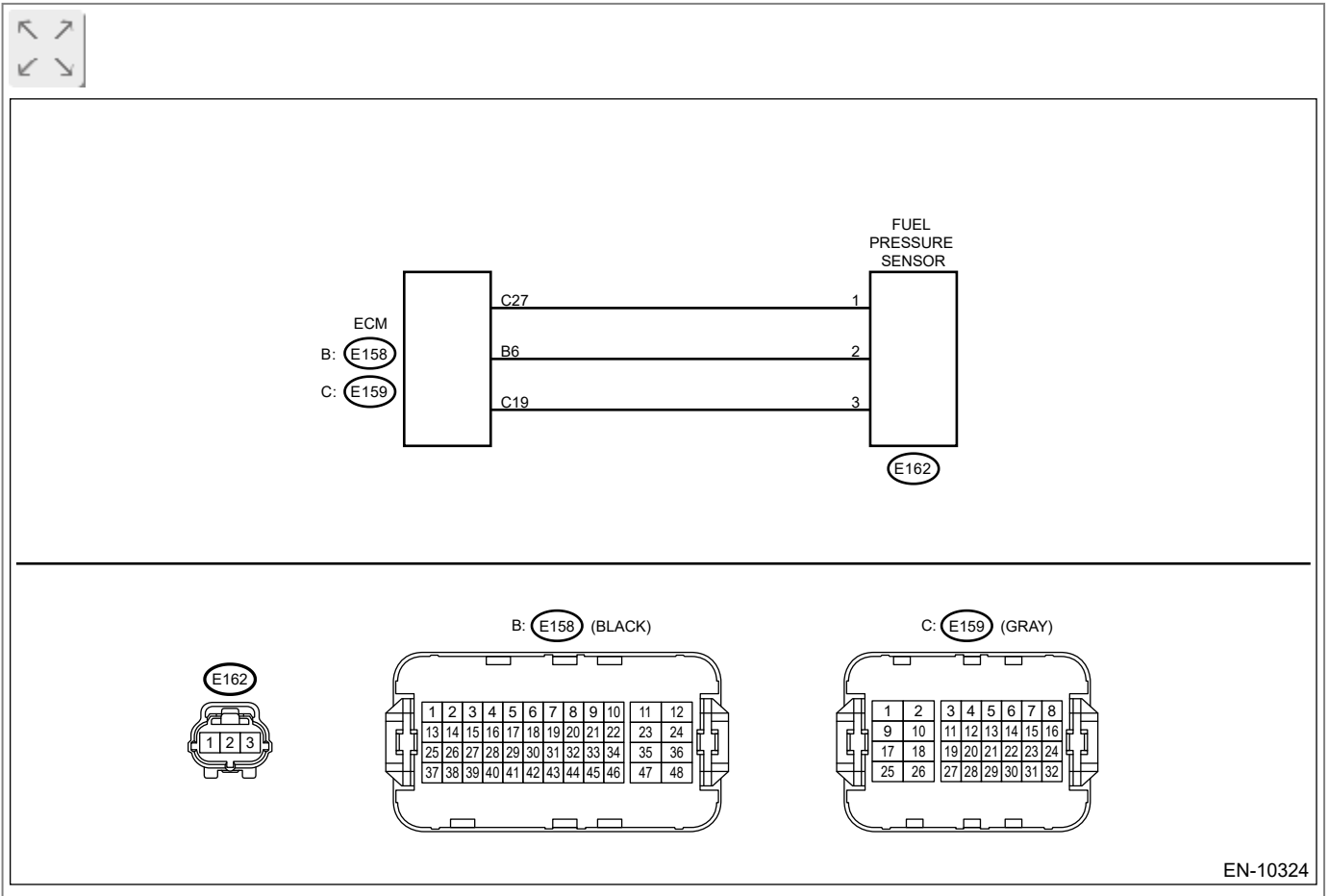
Improper idling

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



EN-10324

1. CHECK CURRENT DATA.

1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Fuel Rail Pressure A].

Note:

- **Subaru Select Monitor**
For detailed operation procedures, refer to "READ CURRENT DATA FOR HVAC SYSTEM".
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value in [Fuel Rail Pressure A] 2500 kPa (25.49 kgf/cm², 362.6 psi) or more?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

2. CHECK FUEL PRESSURE SENSOR POWER SUPPLY.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from the fuel pressure sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between fuel pressure sensor connector and engine ground.

Connector & terminal

(E162) No. 3 (+) — Engine ground (-):

Is the voltage 4.5 V or more?

Yes

 [Go to 3.](#)

No

 [Go to 6.](#)

3. CHECK FUEL PRESSURE SENSOR SIGNAL.

1. Connect all connectors.
2. Start the engine.
3. Using the Subaru Select Monitor or a general scan tool, read the value of [Fuel Rail Pressure A] during idling.

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".
- **General scan tool.**
For detailed operation procedures, refer to the general scan tool operation manual.

4. Measure the voltage between ECM connectors.

Connector & terminal


(E158) No. 6 (+) — (E159) No. 27 (-):

Is the voltage 0.75 — 1.5 V when the value of [Fuel Rail Pressure A] approx. 4000 kPa (40.79 kgf/cm², 580.2 psi)?

Yes

Repair the poor contact of ECM connector.

No

 [Go to 4.](#)

4. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the fuel pressure sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and fuel pressure sensor connector.


Connector & terminal

(E159) No. 27 — (E162) No. 1:

(E158) No. 6 — (E162) No. 2:

Is the resistance less than 1 Ω?

Yes

 [Go to 5.](#)

No

Repair the open circuit in harness between ECM connector and fuel pressure sensor connector.

5. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR.


Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(E158) No.6 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

Replace the fuel pressure sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pressure Sensor.](#)

No

Repair the ground short circuit of harness between ECM connector and fuel

No

pressure sensor connector.

6. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and fuel pressure sensor connector.

Connector & terminal

(E159) No.19 — (E162) No.3:

Is the resistance less than 1Ω?

Yes

 [Go to 7.](#)

No

Repair the open circuit in harness between ECM connector and fuel pressure sensor connector.

7. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR.

Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(E159) No.19 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

Repair the poor contact of ECM connector.

No

Repair the ground short circuit of harness between ECM connector and fuel pressure sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect the signal stuck of the fuel pressure sensor.

Judge as NG when the voltage change amount per unit time of the fuel pressure sensor does not exceed the threshold value.

2. EXECUTION CONDITION

Secondary Parameters	Execution
----------------------	-----------

	condition
Battery voltage	$\geq 10.9 \text{ V}$
Engine speed	$\geq 475 \text{ rpm}$
Fuel cut	Not performed

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after starting the engine.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Change amount per unit time of fuel pressure sensor voltage	$< 3.8 \text{ V/s}$

Time needed for diagnosis: 10 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1261 CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN

DTC detecting condition:

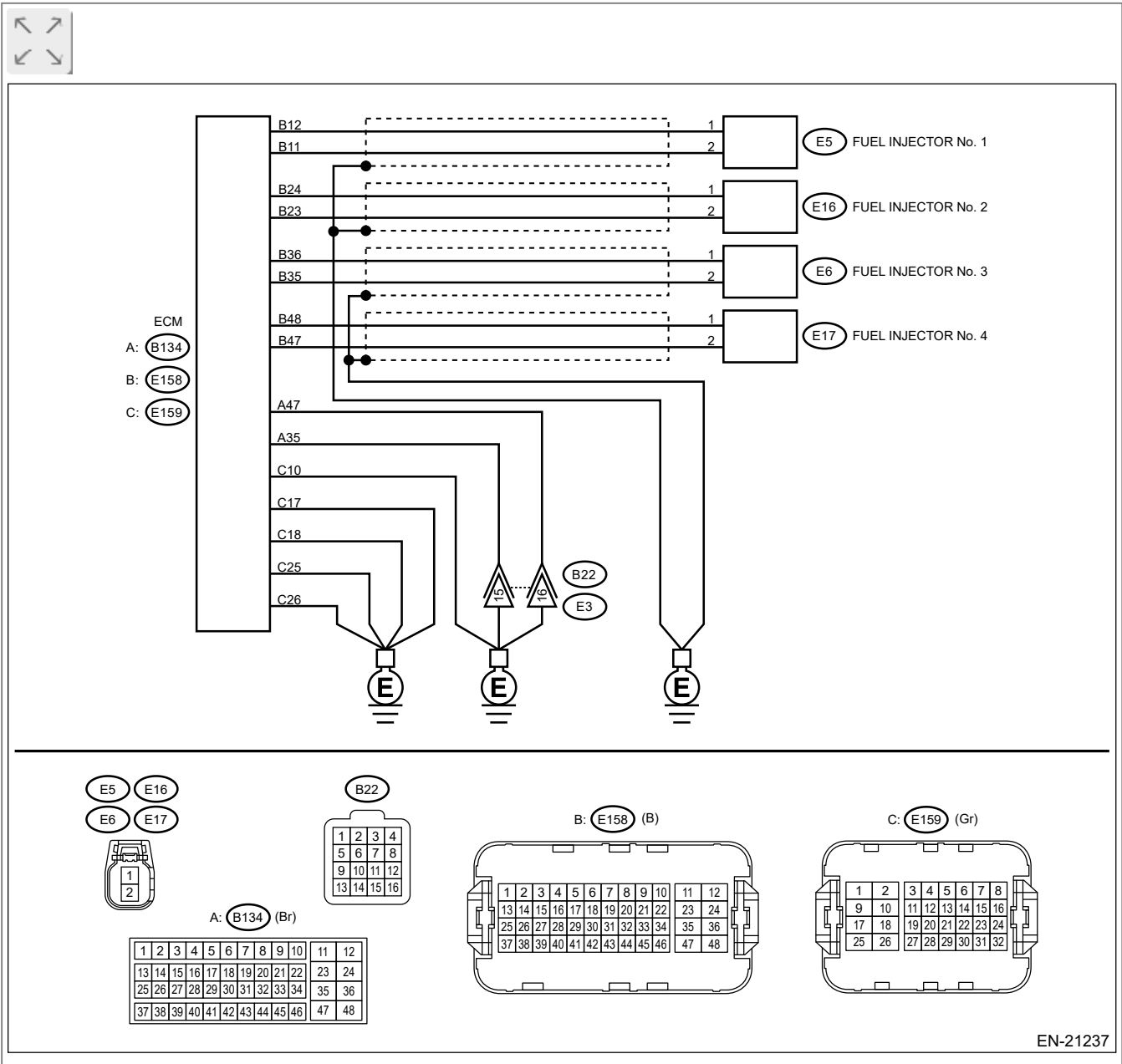
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM terminals on faulty fuel injectors.

Connector & terminal

#1 (E158) No. 11 — (E158) No. 12:

#2 (E158) No. 23 — (E158) No. 24:

#3 (E158) No. 35 — (E158) No. 36:

#4 (E158) No. 47 — (E158) No. 48:

Is the resistance 1.89 — 2.31 Ω (at 20°C (68°F))?

Yes

[Go to 2.](#)

No

[Go to 3.](#)

2. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.



Measure the resistance between ECM and engine ground on faulty injectors.

Connector & terminal

#1 (E158) No. 12 — Engine ground:

#1 (E158) No. 11 — Engine ground:

#2 (E158) No. 24 — Engine ground:

#2 (E158) No. 23 — Engine ground:

#3 (E158) No. 36 — Engine ground:

#3 (E158) No. 35 — Engine ground:

#4 (E158) No. 48 — Engine ground:

#4 (E158) No. 47 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

Repair the poor contact of ECM connector.

No

[Go to 3.](#)

3. CHECK FUEL INJECTOR.




Check the fuel injector on faulty cylinder. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Injector>INSPECTION.](#)

Are fuel injectors OK?

Yes

Repair the open or ground short circuit in harness between ECM and fuel injector connector.

No

Replace the faulty fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Injector.](#)

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of fuel injector circuit function.

Judge as NG when ECM detects any malfunction in the diagnostic items listed below.

Diagnostic item	Malfunction Criteria
Power supply short	ECM low side terminal voltage of the fuel injector circuit is high.
Ground short	ECM low side terminal voltage of the fuel injector circuit is low.
Open circuit	Fuel injector current is low.
Overcurrent	Fuel injector current is high.
Short circuit	The time when the fuel injector current reaches the target current is short.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 9.4 V
Engine speed	> 0 rpm
Fuel cut	Not performed

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

DIAGNOSIS FOR POWER SUPPLY SHORT

Judgment value

Malfunction Criteria	Threshold Value
Terminal voltage	≥ 4.1 V

DIAGNOSIS FOR GROUND SHORT

Judgment value

Malfunction Criteria	Threshold Value
Terminal voltage	≤ 0.8 V

DIAGNOSIS FOR OPEN CIRCUIT

Judgment value

Malfunction Criteria	Threshold Value
Fuel injector current	$\leq 0.5 \text{ A}$

DIAGNOSIS FOR OVERCURRENT**Judgment value**

Malfunction Criteria	Threshold Value
Fuel injector current	$\geq 22\text{A}$

DIAGNOSIS FOR SHORT CIRCUIT**Judgment value**

Malfunction Criteria	Threshold Value
Time for reaching target current	$\leq 0.075 \text{ ms}$


Time needed for diagnosis: TDC \times 50 times

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1262 CYLINDER 2 DIRECT FUEL INJECTOR CIRCUIT/OPEN

Note:

For the diagnostic procedure, refer to DTC P1261.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1261 CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN.](#)

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to DTC P1261.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1261 CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P1263 CYLINDER 3 DIRECT FUEL INJECTOR CIRCUIT/OPEN

Note:

For the diagnostic procedure, refer to DTC P1261.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1261 CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN.](#)

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to DTC P1261  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1261 CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P1264 CYLINDER 4 DIRECT FUEL INJECTOR CIRCUIT/OPEN

Note:

For the diagnostic procedure, refer to DTC P1261.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1261 CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P1261.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1261 CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN.](#)



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1449 EVAP SYSTEM CLOG DETECTED (AIR FILTER)

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.


Caution:

After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode>OPERATION.](#) and Inspection Mode  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode>PROCEDURE.](#)


1. CHECK FOR ANY OTHER DTC ON DISPLAY. 

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)


No

 [Go to 2.](#)


2. CHECK DRAIN TUBE B OF LEAK CHECK VALVE ASSEMBLY. 

Is the drain tube B of leak check valve assembly clogged?

Yes

Replace the drain tube B of leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly.](#)


No

 [Go to 3.](#)

3. CHECK DRAIN TUBE C, DRAIN PIPE AND DRAIN HOSE. 

Is the drain tube C, drain pipe or drain hose on the atmospheric release side of leak check valve assembly clogged?

Yes

Replace the drain tube C, drain pipe or drain hose.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Filler Pipe.](#)

No

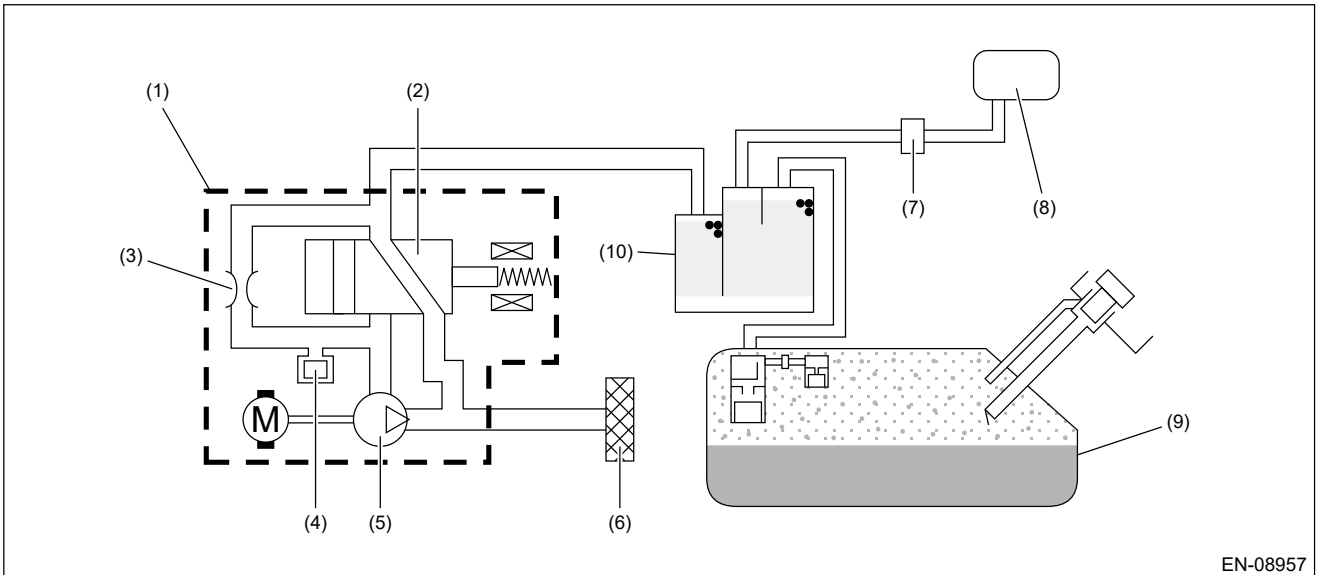
Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly.](#)

1. OUTLINE OF DIAGNOSIS

Detect the drain filter clogging by the pressure change during purge introduction.

Judge as drain filter clogging malfunction if the pressure in the evaporative emission system piping suddenly decreases by the purging.

2. COMPONENT DESCRIPTION



- | | | |
|---|----------------------------------|---------------|
| (1) Leak check valve ASSY | (5) Vacuum pump | (9) Fuel tank |
| (2) Switching valve | (6) Drain filter | (10) Canister |
| (3) Reference orifice (0.02 inch orifice) | (7) Purge control solenoid valve | |
| (4) Pressure sensor | (8) Intake manifold | |

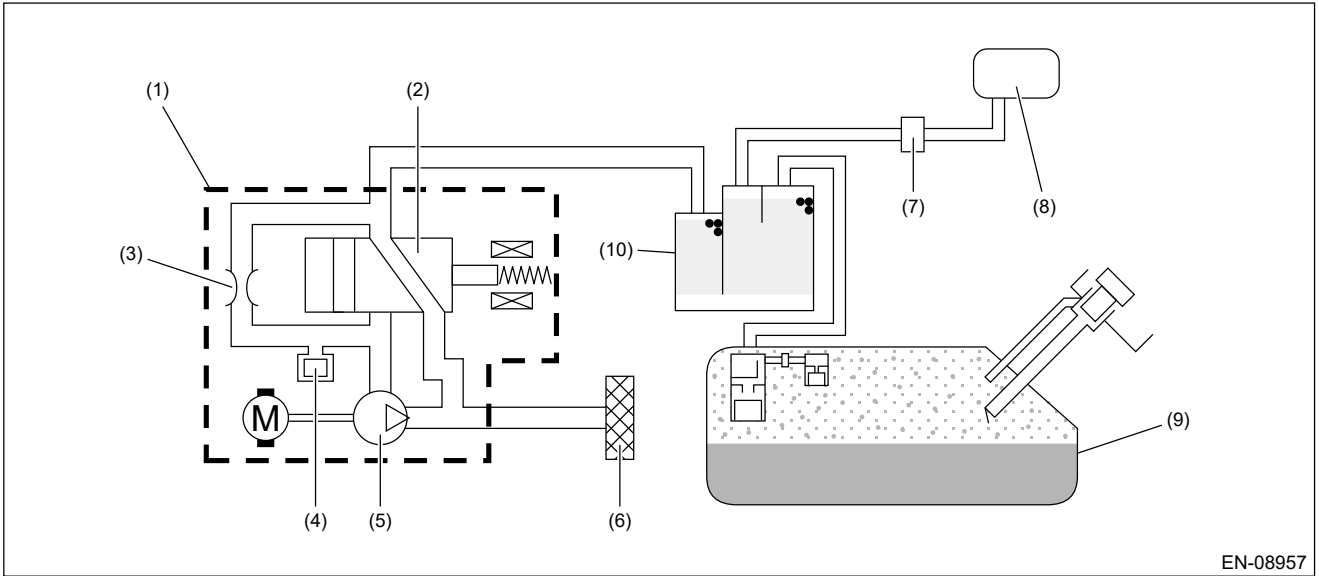
3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Elapsed time after starting the engine	≥ 20000 ms
Evaporative Leak Check Module vacuum pump	Not in operation
Evaporative Leak Check Module switching valve	Open

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously when purging is performed after 20000 ms have passed since the engine started.

5. DIAGNOSTIC METHOD



Calculate the difference between the Evaporative Leak Check Module pressure sensor output value of 5 seconds ago and the value at the present moment, and if the value is greater than the judgment value, detect as filter clogging trouble and judge as malfunction.

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Pressure sensor output value as of 5 seconds ago – Current pressure sensor output value	> 1370 Pa (10.3 mmHg, 0.4 inHg)

Time needed for diagnosis: 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1451 EVAP SYSTEM CLOG DETECTED (PIPE)

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

1. CHECK DRAIN TUBE BETWEEN CANISTER AND LEAK CHECK VALVE ASSEMBLY.

Is the drain tube between canister and leak check valve assembly clogged?

Yes

Replace the drain tube between the canister and leak check valve assembly.  Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES) (H4DOTC)>Leak Check Valve Assembly.



No

 Go to 2.



2. CHECK HOSE AND TUBE BETWEEN CANISTER AND FUEL TANK.

Are the hose and tube between the canister and fuel tank clogged?

Yes

Replace the hose or tube between the canister and fuel tank.  Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES) (H4DOTC)>Canister.  Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DOTC)>Fuel Tank.

No

Replace the canister.  Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES) (H4DOTC)>Canister.
After the operation is complete, go to the next step.  Go to 3.


3. CHECK EVAPORATIVE EMISSION CONTROL SYSTEM.

Perform drive cycle I. [Ref. to Target Not Found](#)

Is DTC P1451 displayed on the display?



Yes


Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly.](#)

No

End.

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to DTC P0455.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0455 EVAP SYSTEM \(CPC\) LEAK DETECTED \(LARGE LEAK\).](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1492 COIL 1 EGR "A" CONTROL CIRCUIT LOW


Note:

For the diagnostic procedure, refer to DTC P1498.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1498 COIL 4 EGR "A" CONTROL CIRCUIT LOW.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P1493 COIL 1 EGR "A" CONTROL CIRCUIT HIGH

Note:

For the diagnostic procedure, refer to DTC P1499.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1499 COIL 4 EGR "A" CONTROL CIRCUIT HIGH.](#)

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to DTC P1499.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1499 COIL 4 EGR "A" CONTROL CIRCUIT HIGH.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P1494 COIL 2 EGR "A" CONTROL CIRCUIT LOW

Note:

For the diagnostic procedure, refer to DTC P1498.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1498 COIL 4 EGR "A" CONTROL CIRCUIT LOW.](#)

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to DTC P1498.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1498 COIL 4 EGR "A" CONTROL CIRCUIT LOW.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC P1495 COIL 2 EGR "A" CONTROL CIRCUIT HIGH

Note:

For the diagnostic procedure, refer to DTC P1499.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1499 COIL 4 EGR "A" CONTROL CIRCUIT HIGH.](#)

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to DTC P1499.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1499 COIL 4 EGR "A" CONTROL CIRCUIT HIGH.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1496 COIL 3 EGR "A" CONTROL CIRCUIT LOW

Note:

For the diagnostic procedure, refer to DTC P1498.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1498 COIL 4 EGR "A" CONTROL CIRCUIT LOW.](#)

1. OUTLINE OF DIAGNOSIS


Note:

For the detection standard, refer to DTC P1498.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1498 COIL 4 EGR "A" CONTROL CIRCUIT LOW.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1497 COIL 3 EGR "A" CONTROL CIRCUIT HIGH

Note:

For the diagnostic procedure, refer to DTC P1499.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1499 COIL 4 EGR "A" CONTROL CIRCUIT HIGH.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P1499.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P1499 COIL 4 EGR "A" CONTROL CIRCUIT HIGH.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1498 COIL 4 EGR "A" CONTROL CIRCUIT LOW



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

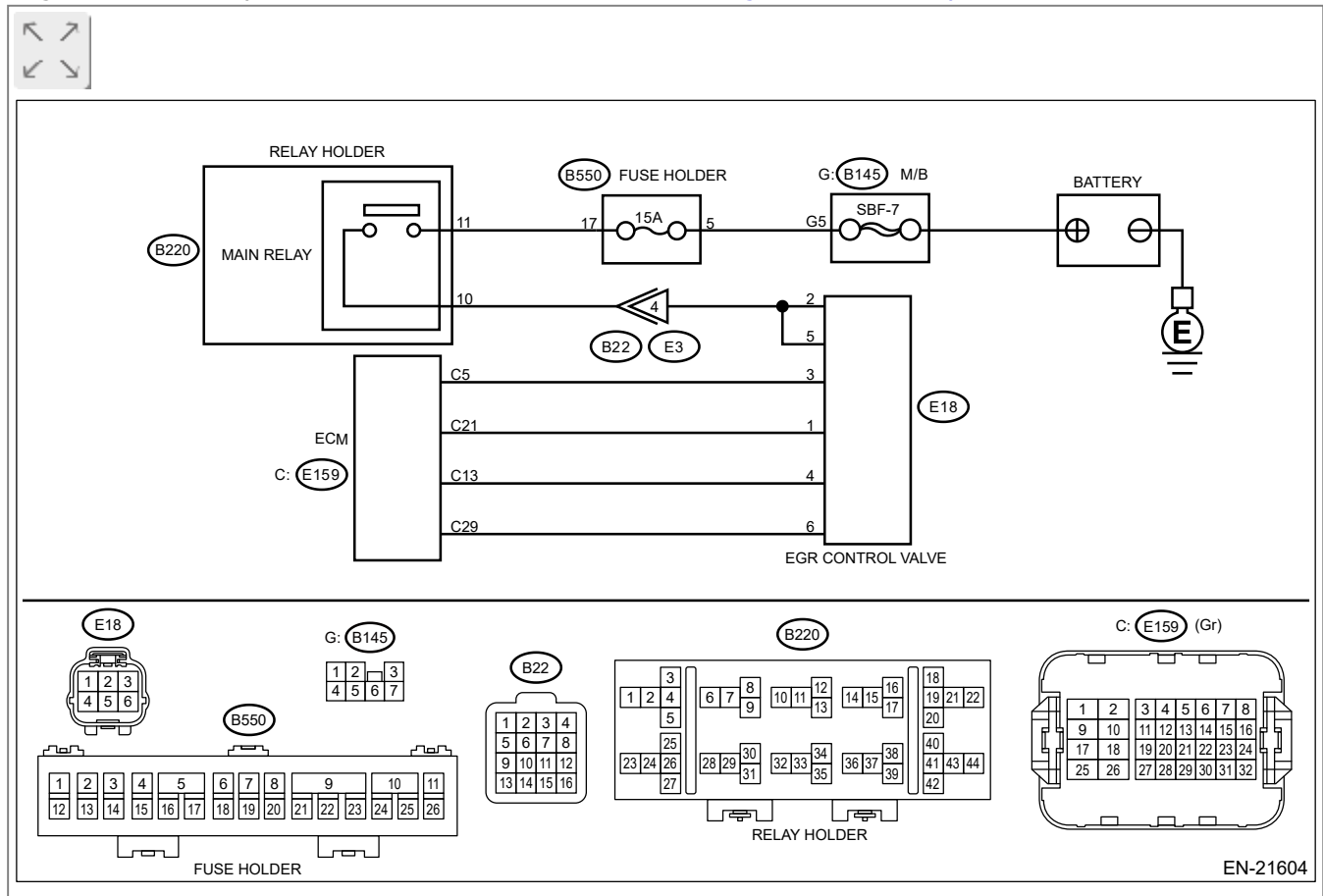
- Improper idling
- Poor driving performance
- Engine breathing

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK POWER SUPPLY TO EGR CONTROL VALVE.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the EGR control valve.

3. Turn the ignition switch to ON.
4. Measure the voltage between EGR control valve connector and engine ground.


Connector & terminal

(E18) No. 2 (+) — Engine ground (-):

(E18) No. 5 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between EGR control valve and main relay connector**
- **Poor contact of coupling connector**

2. CHECK HARNESS BETWEEN ECM AND EGR CONTROL VALVE CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM and EGR control valve connector.

Connector & terminal

DTC P1492; (E159) No. 5 — (E18) No. 3:

DTC P1494; (E159) No. 21 — (E18) No. 1:

DTC P1496; (E159) No. 13 — (E18) No. 4:

DTC P1498; (E159) No. 29 — (E18) No. 6:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit in harness between ECM and EGR control valve connector.

3. CHECK HARNESS BETWEEN ECM AND EGR CONTROL VALVE CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance between ECM and engine ground.

Connector & terminal

DTC P1492; (E159) No. 5 — Engine ground:

DTC P1494; (E159) No. 21 — Engine ground:

DTC P1496; (E159) No. 13 — Engine ground:
DTC P1498; (E159) No. 29 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

[Go to 4.](#)

No

Repair the ground short in harness between ECM and EGR control valve connector.

4. CHECK FOR POOR CONTACT.

Check poor contact between ECM and EGR control valve connector.

Is there poor contact in ECM or EGR control valve connector?

Yes

Repair the poor contact of ECM or EGR control valve connector.

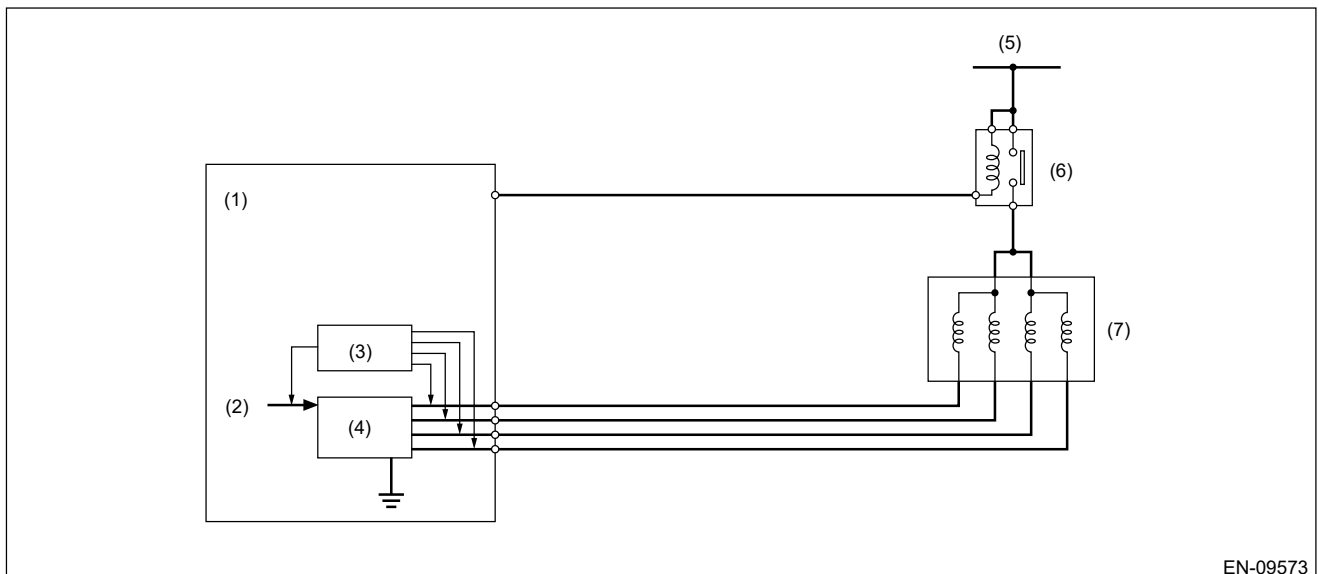
No

Replace EGR control valve. [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>EGR Control Valve.](#)

1. OUTLINE OF DIAGNOSIS

- Detects open or short circuit of EGR.
- Judge as NG when the ECM output level differs from the actual terminal level.

2. COMPONENT DESCRIPTION



EN-09573

(1) Engine control module (ECM)

(4) Switch circuit

(6) Main relay

(2) Computer unit (CPU)

(5) Battery voltage

(7) EGR control valve

(3) Detecting circuit

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
EGR control signal	OFF
Battery voltage	$\geq 10.9 \text{ V}$

4. GENERAL DRIVING CYCLE

Perform diagnosis continuously during EGR operation.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Terminal voltage	$\leq 2.2 \text{ V}$

Time needed for diagnosis: 2500 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1499 COIL 4 EGR "A" CONTROL CIRCUIT HIGH



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

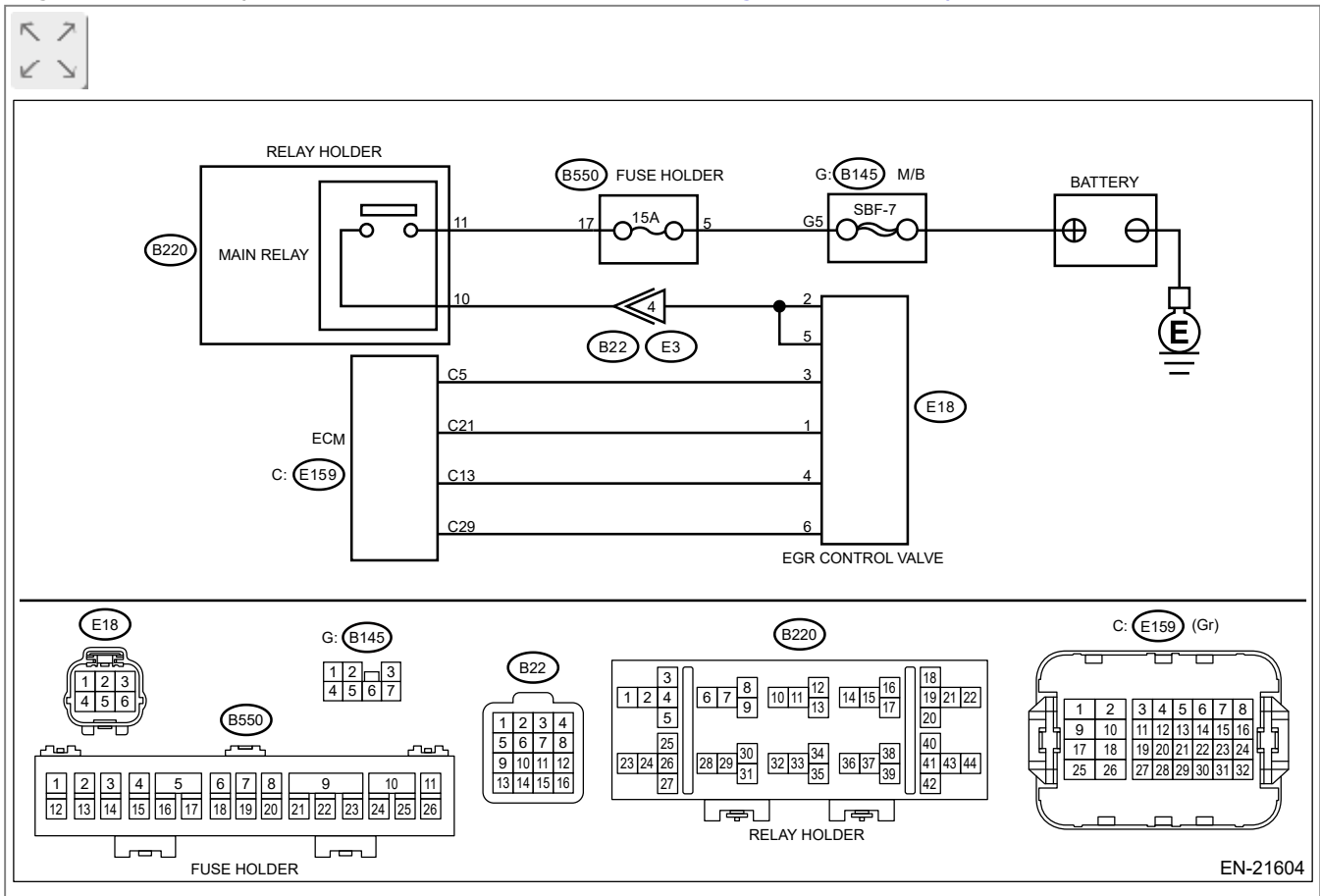
- Improper idling
- Poor driving performance
- Engine breathing

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND EGR CONTROL VALVE CONNECTOR.

1. Turn the ignition switch to OFF.

2. Disconnect the connector from the EGR control valve.
3. Disconnect the connector from ECM.
4. Turn the ignition switch to ON.
5. Measure the voltage between ECM and engine ground.

Connector & terminal

DTC P1493; (E159) No. 5 (+) — Engine ground (–):
DTC P1495; (E159) No. 21 (+) — Engine ground (–):
DTC P1497; (E159) No. 13 (+) — Engine ground (–):
DTC P1499; (E159) No. 29 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power in the harness between the ECM and EGR control valve connector.

No

 [Go to 2.](#)

2. CHECK EGR CONTROL VALVE.



Measure the resistance between EGR control valve terminals.

Terminals


DTC P1493; No. 2 — No. 3:
DTC P1495; No. 2 — No. 1:
DTC P1497; No. 5 — No. 4:
DTC P1499; No. 5 — No. 6:

Is the resistance 20 Ω or more?

Yes

Repair the poor contact of ECM connector.

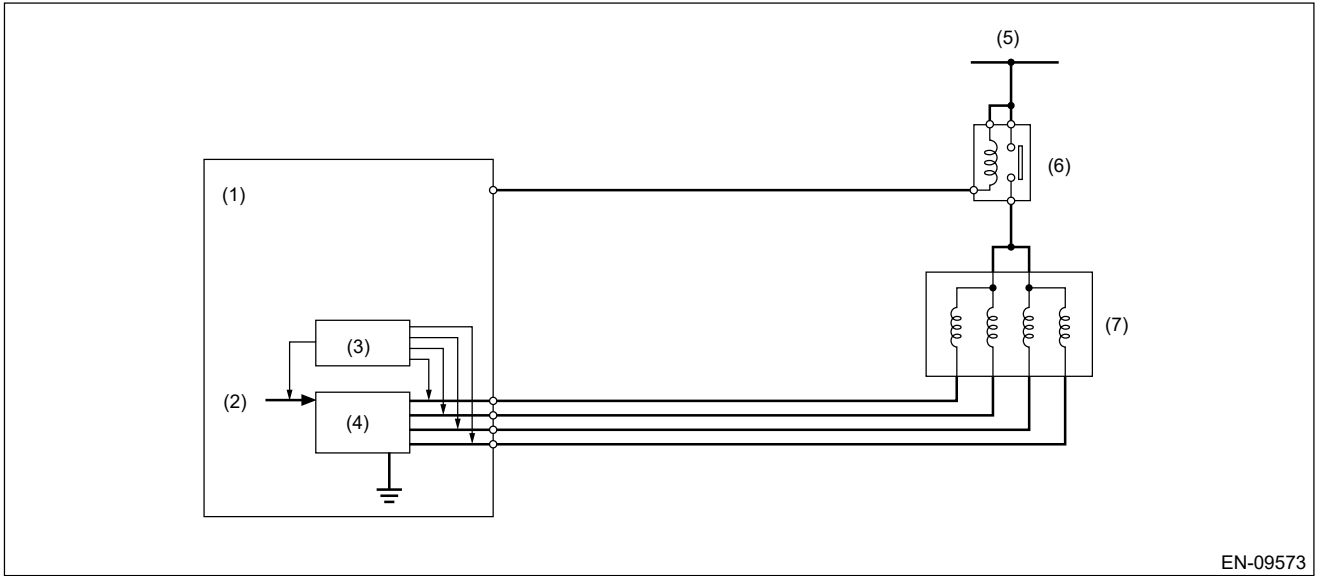
No

Replace EGR control valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>EGR Control Valve.](#)

1. OUTLINE OF DIAGNOSIS

- Detects open or short circuit of EGR.
- Judge as NG when the ECM output level differs from the actual terminal level.

2. COMPONENT DESCRIPTION



- (1) Engine control module (ECM) (4) Switch circuit (6) Main relay
 (2) Computer unit (CPU) (5) Battery voltage (7) EGR control valve
 (3) Detecting circuit

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
EGR control signal	ON
Battery voltage	$\geq 10.9 \text{ V}$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Terminal current	$\geq 5 \text{ A}$

Time needed for diagnosis: 2250 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1530 BATTERY CURRENT SENSOR CIRCUIT LOW

DTC detecting condition:

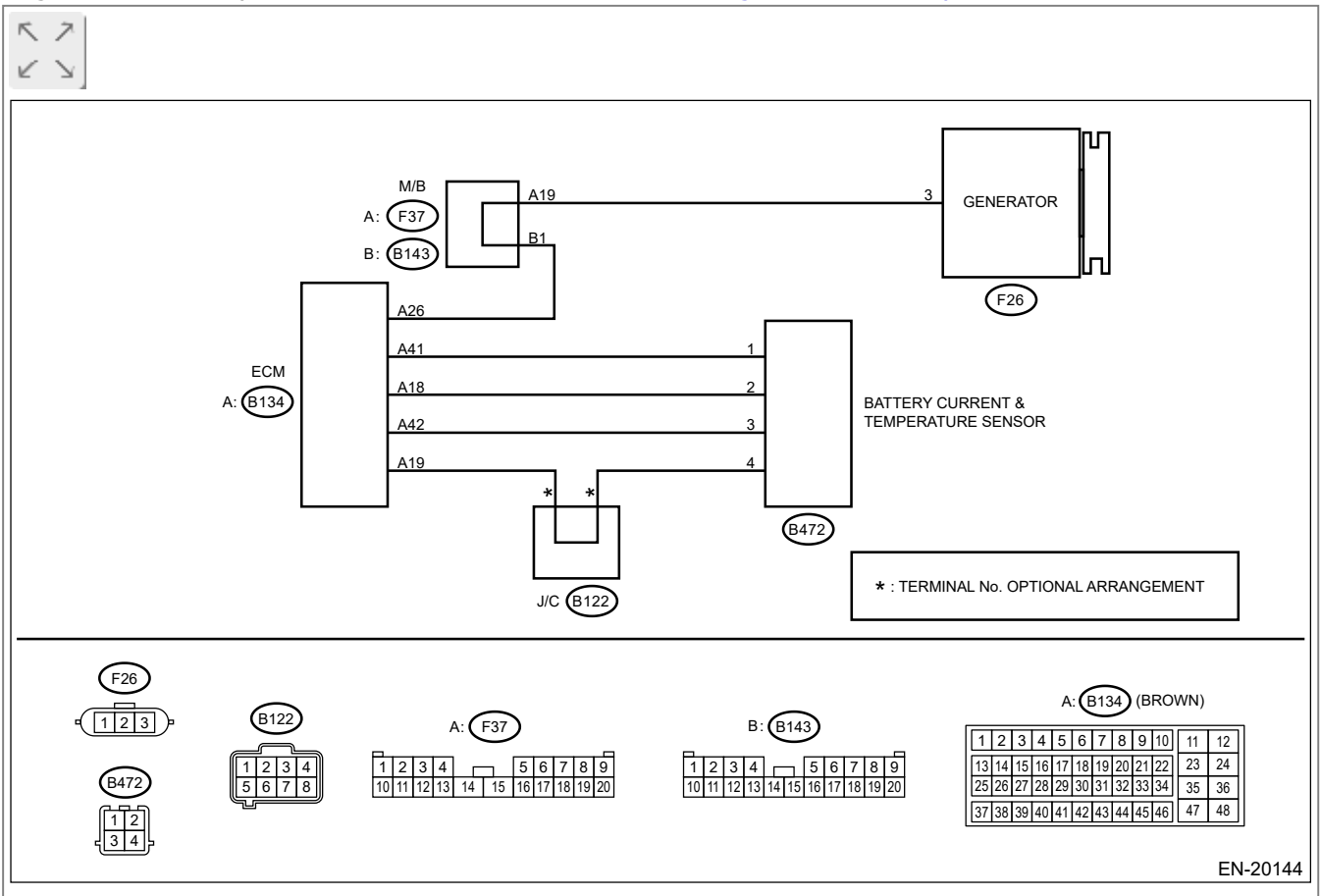
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK CURRENT DATA.

1. Start the engine.
2. Read the value of Battery current value using the Subaru Select Monitor.

Note:

For detailed procedures, refer to "Data Monitor".  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Subaru Select Monitor.

Is the value of Battery current value 100 A or more?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN ECM AND BATTERY CURRENT & TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the battery current & temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and battery current & temperature sensor connector.

Connector & terminal

(B134) No. 18 — (B472) No. 2:

(B134) No. 42 — (B472) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit of harness between ECM and battery current & temperature sensor connector.

3. CHECK HARNESS BETWEEN ECM AND BATTERY CURRENT & TEMPERATURE SENSOR CONNECTOR.

Measure the resistance between ECM and engine ground.

Connector & terminal

(B134) No. 18 — Engine ground:

(B134) No. 42 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair the ground short circuit of harness between ECM and battery current & temperature sensor connector.

4. CHECK FOR POOR CONTACT.




Check for poor contact between the ECM and battery current & temperature sensor connectors.

Is there poor contact of the ECM or battery current & temperature sensor connectors?

Yes

Repair any poor contact between the ECM or battery current & temperature sensor connectors.

No

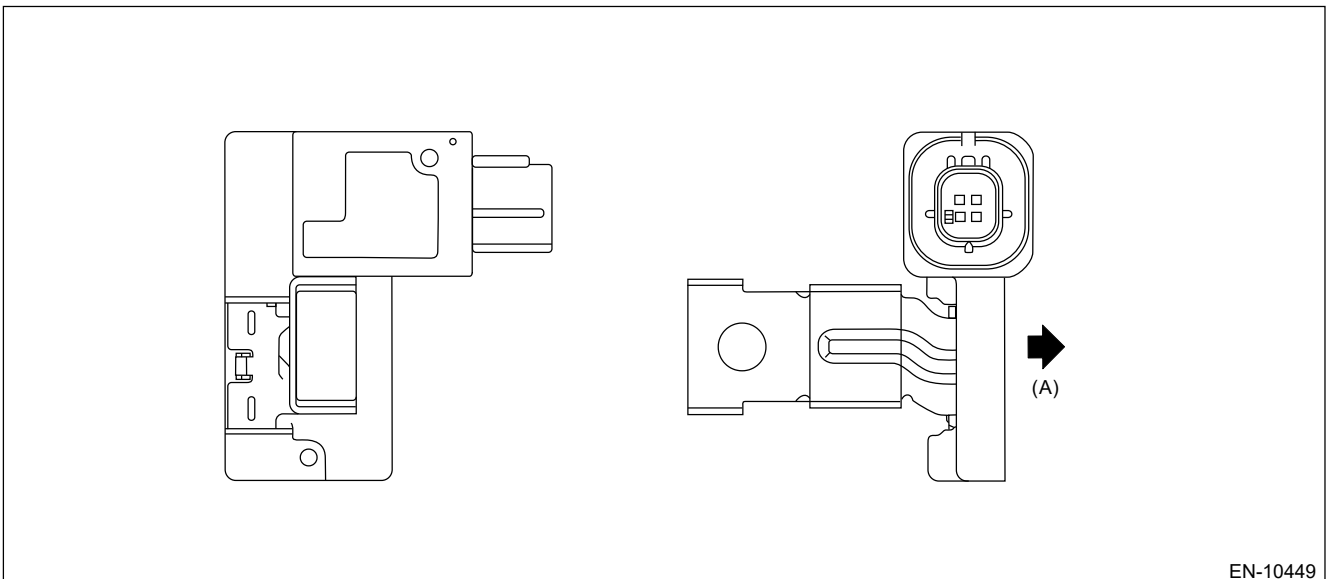
Replace the battery current & temperature sensor.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery Current & Temperature Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of battery current sensor.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(A) Positive direction of measured current

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Elapsed time after starting the engine	> 1000 ms
Engine speed	> 500 rpm

Ignition switch	ON
-----------------	----

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	< 0.226 V

Time needed for diagnosis: 500 ms

Malfunction indicator light illumination: Does not illuminate even when malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1531 BATTERY CURRENT SENSOR CIRCUIT HIGH

DTC detecting condition:

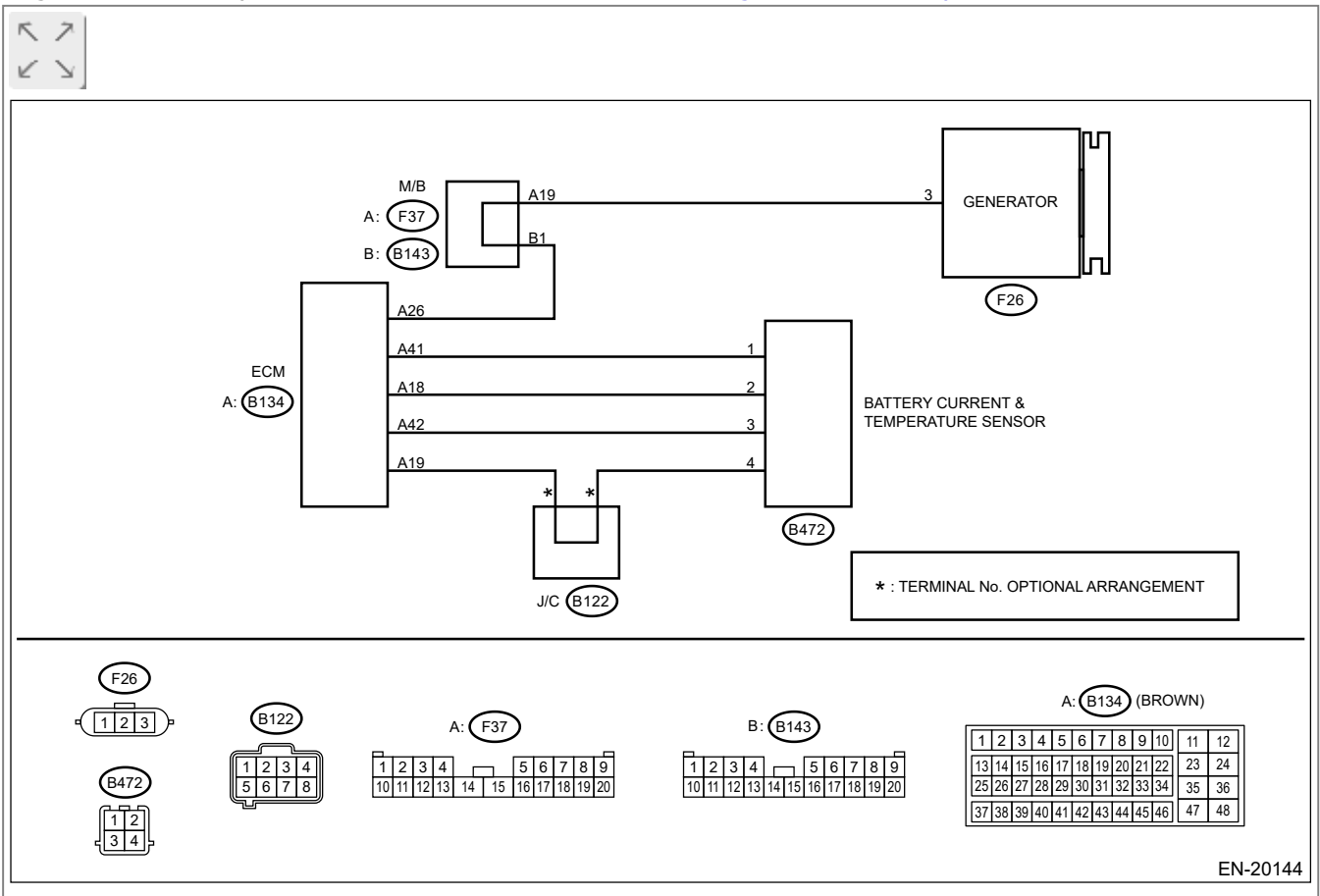
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK CURRENT DATA.


1. Start the engine.
2. Read the value of Battery current value using the Subaru Select Monitor.

Note:

For detailed procedures, refer to "Data Monitor".  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Subaru Select Monitor.

Is the value of battery current value -100 A or less?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN ECM AND BATTERY CURRENT & TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the battery current & temperature sensor.
3. Start the engine.
4. Read the value of Battery current value using the Subaru Select Monitor.

Note:

For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

Is the value of battery current value –100 A or less?

Yes

Repair the short circuit to power supply in harness between ECM and battery current & temperature sensor connector.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND BATTERY CURRENT & TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between battery current & temperature sensor connector and engine ground.

Connector & terminal

(B472) No. 4 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- Open circuit in harness between ECM and battery current & temperature sensor connector
- Poor contact of joint connector

4. CHECK FOR POOR CONTACT.



Check for poor contact of battery current & temperature sensor connector.

Is there poor contact of battery current & temperature sensor connector?

Yes

Repair the poor contact of battery current & temperature sensor connector.

No

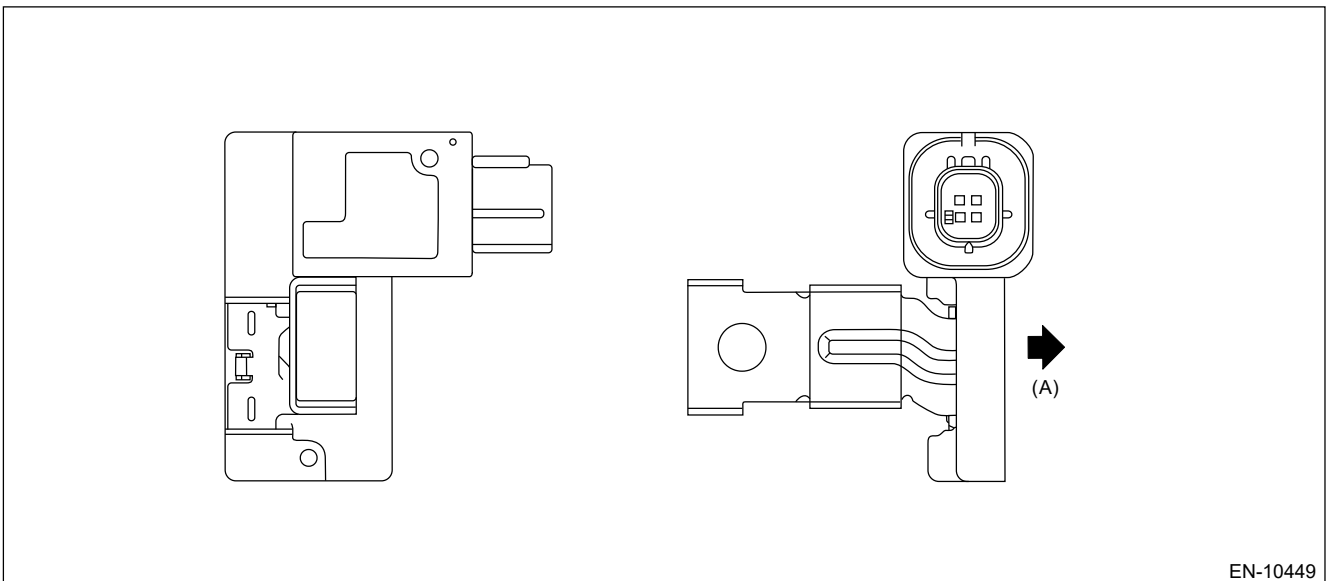
Replace the battery current & temperature sensor. [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery Current & Temperature Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of battery current sensor.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(A) Positive direction of measured current

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Elapsed time after starting the	> 1000 ms

engine	
Engine speed	> 500 rpm
Ignition switch	ON

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	≥ 4.875 V

Time needed for diagnosis: 500 ms

Malfunction indicator light illumination: Does not illuminate even when malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1532 BATTERY CHARGING SYSTEM

DTC detecting condition:

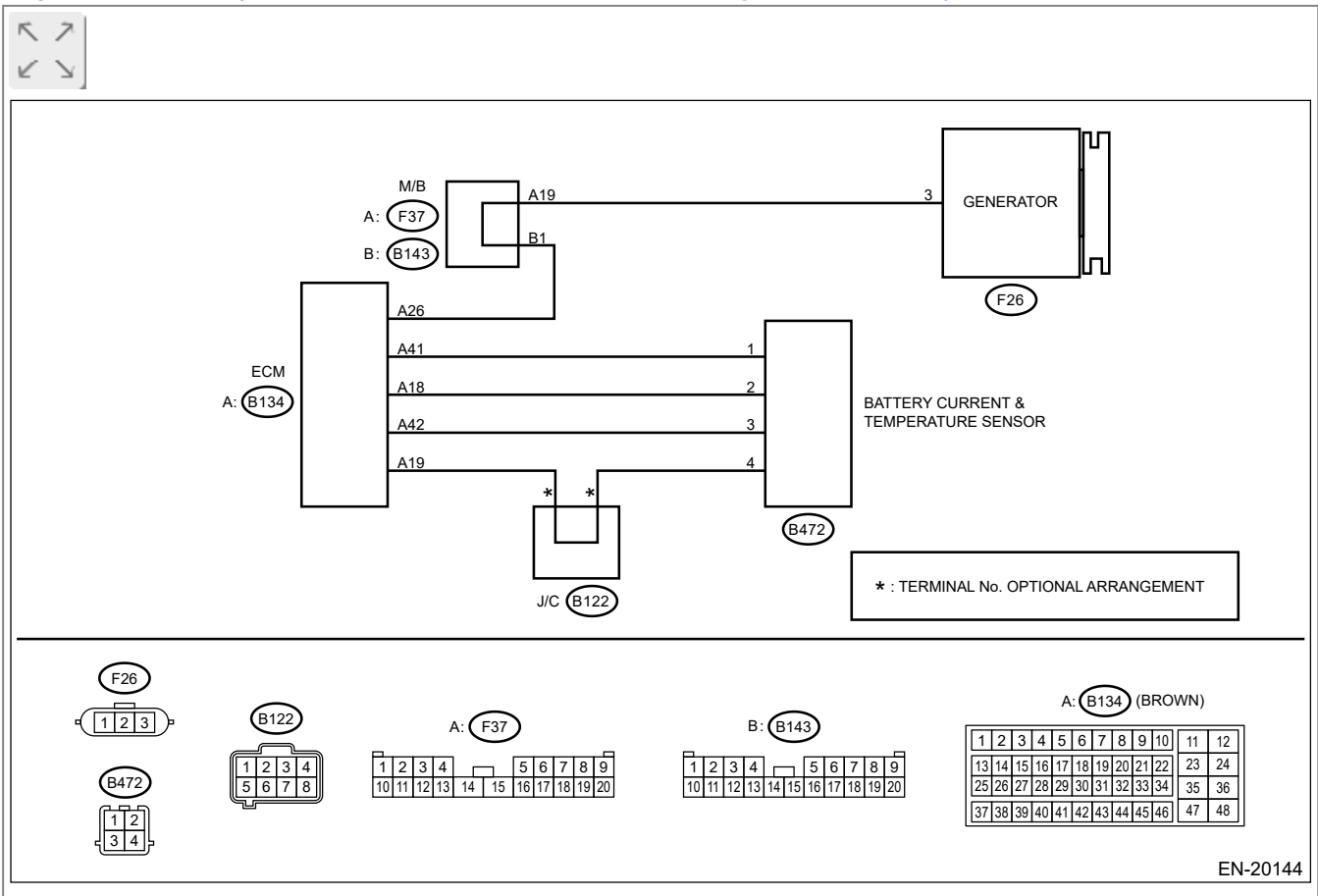
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



EN-20144

1. CHECK INSTALLATION CONDITION OF BATTERY.



Turn the ignition switch to OFF.

Are the positive and negative terminals of battery securely tightened?

Yes

Go to 2.

No

Tighten the positive and negative terminals of battery securely.

2. CHECK BATTERY TERMINAL.



Is there any connection of electrical parts to the positive and negative terminals of battery?

Yes

Remove the wiring of electrical parts connected to the positive and negative terminals of battery.

Note:

Direct connection with any electrical parts may cause the erroneous operation of battery current & temperature sensor.

No

[Go to 3.](#)

3. CHECK INSTALLATION CONDITION OF V-BELT.



Check the installation condition of V-belt. [Ref. to MECHANICAL\(H4DOTC\)>V-belt>INSPECTION.](#)

Is the V-belt installed properly?

Yes

[Go to 4.](#)

No

Install the V-belt properly. [Ref. to MECHANICAL\(H4DOTC\)>V-belt.](#)

4. CHECK BATTERY VOLTAGE.



1. Start the engine.
2. Select "High mode" from "Alternator control" in "System Operation Check Mode", and measure the battery voltage after 10 seconds or more have passed.

Note:

For detailed procedures, refer to "Active Test". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Active Test.](#)

3. Select "Low mode" from "Alternator control" in "System Operation Check Mode", and measure the battery voltage.

Caution:

Do not continue the "Low mode" operation for one minute or more.

Note:

For detailed procedures, refer to "Active Test". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Active Test.](#)

Does the battery voltage decrease from 13.9 — 14.8 V to 12.2 — 13.1 V while executing step 2) and step 3)?

Yes

 [Go to 7.](#)

No

 [Go to 5.](#)

5. CHECK HARNESS BETWEEN ECM AND GENERATOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the generator.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and generator connector.

Connector & terminal

(B134) No. 26 — (F26) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 6.](#)

No

Repair the open circuit of harness between ECM and generator connector.

6. CHECK HARNESS BETWEEN ECM AND GENERATOR CONNECTOR.

Measure the resistance between generator connector and engine ground.

Connector & terminal

(F26) No. 3 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 7.](#)

No

Repair the ground short circuit of harness between ECM and generator connector.


7. CHECK BATTERY CURRENT & TEMPERATURE SENSOR.

Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 8.](#)

8. CHECK HARNESS BETWEEN ECM AND BATTERY CURRENT & TEMPERATURE SENSOR CONNECTOR.

1. Disconnect the connectors from the battery current & temperature sensor.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM and battery current & temperature sensor connector.


Connector & terminal

(B134) No. 18 — (B472) No. 2:

(B134) No. 42 — (B472) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 9.](#)

No

Repair the open circuit of harness between ECM and battery current & temperature sensor connector.

9. CHECK HARNESS BETWEEN ECM AND BATTERY CURRENT & TEMPERATURE SENSOR CONNECTOR.

Measure the resistance between ECM and engine ground.


Connector & terminal

(B134) No. 18 — Engine ground:

(B134) No. 42 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 10.](#)

No

Repair the ground short circuit of harness between ECM and battery current & temperature sensor connector.

10. CHECK HARNESS BETWEEN ECM AND BATTERY CURRENT & TEMPERATURE SENSOR CONNECTOR.


Measure the resistance between ECM connectors.

Connector & terminal

(B134) No. 18 — (B134) No. 42:

Is the resistance 1 MΩ or more?

Yes

 [Go to 11.](#)

No

Repair the short circuit to power supply in harness between ECM and battery current & temperature sensor connector.

11. CHECK HARNESS BETWEEN ECM AND BATTERY CURRENT & TEMPERATURE SENSOR CONNECTOR.


1. Connect the connector to ECM.
2. Measure the resistance of harness between battery current & temperature sensor connector and engine ground.

Connector & terminal

(B472) No. 4 — Engine ground:

Is the resistance less than 5 Ω?

Yes

 [Go to 12.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and battery current & temperature sensor connector**
- **Poor contact of joint connector**

12. CHECK FOR POOR CONTACT.


Check for poor contact of battery current & temperature sensor connector.

Is there poor contact of battery current & temperature sensor connector?

Yes

Repair the poor contact of battery current & temperature sensor connector.

No

Replace the battery current & temperature sensor.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery Current & Temperature Sensor.](#)

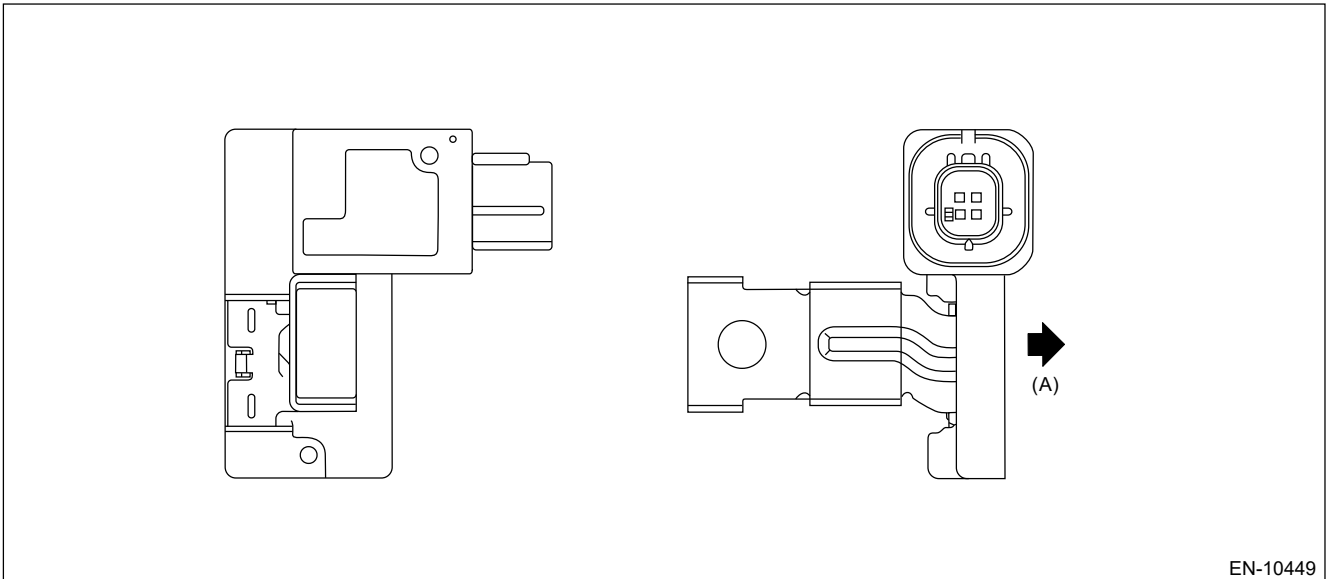
1. OUTLINE OF DIAGNOSIS

Detect the output property and malfunction of battery current sensor.

Judge as NG when there is no variation (stuck) under a condition where the battery current sensor output should have changed or when difference between output and battery current value is larger

than expected (characteristics malfunction).

2. COMPONENT DESCRIPTION



(A) Positive direction of measured current

3. EXECUTION CONDITION

- Stuck

Secondary Parameters	Execution condition
Ignition switch	ON
During switchover of regulating voltage	High condition judgment*1 ↔ Low condition judgment*2 However, the generator target duty has not experienced the following during switchover. $40\% \leq \text{Generator target duty} < 60\%$
*1 High condition judgment	
Continuous time during which all the conditions listed below are met	$\geq 5000 \text{ ms}$
• Battery voltage	$\geq 13.7 \text{ V}$
• Generator final output duty	$\geq 60\%$

• Engine speed	≥ 600 rpm
*2 Low condition judgment	
Continuous time during which all the conditions listed below are met	≥ 5000 ms
• Battery voltage	< 13.2 V
• Generator final output duty	< 40%
or	
• Engine speed	< 600 rpm

- Characteristics malfunction

Secondary Parameters	Execution condition
Ignition switch During switchover of regulating voltage	ON High condition judgment is established. Target duty ≥ 60% → target duty < 40% or Low condition judgment is established. Target duty < 40% → target duty ≥ 60%

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

- **Stuck**

Judge as NG when the following conditions are repeated 10 times or more.

Judgment value

Malfunction Criteria	Threshold Value
Difference between maximum value and minimum value in output voltage	< 0.07 V

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Does not illuminate even when malfunction occurs.

- **Characteristics malfunction (charge side)**

Within 30000 ms from "enable condition not met" to "enable condition met", judge as NG when the time required for meeting the following conditions exceeds the predetermined time.

(When NG judgment is performed, NG status is retained during that driving cycle.)

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$0 \text{ V} \leq \text{Output voltage} < 2.4 \text{ V}$
and	
Battery voltage	$< 13.2 \text{ V}$

Time needed for diagnosis: 26000 ms

Malfunction indicator light illumination: Does not illuminate even when malfunction occurs.

• Characteristics malfunction (discharge side)

Within 30000 ms from "enable condition not met" to "enable condition met", judge as NG when the time required for meeting the following conditions exceeds the predetermined time.

(Within 30000 ms from "enable condition not met" to "enable condition met", the target duty $\geq 60\%$ has not been experienced.)

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$2.6 \text{ V} \leq \text{Output voltage} < 5 \text{ V}$
and	
Battery voltage	$\geq 13.7 \text{ V}$

Time needed for diagnosis: 26000 ms

Malfunction indicator light illumination: Does not illuminate even when malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1603 ENGINE STALL HISTORY

DTC detecting condition:

Immediately at fault recognition

Caution:

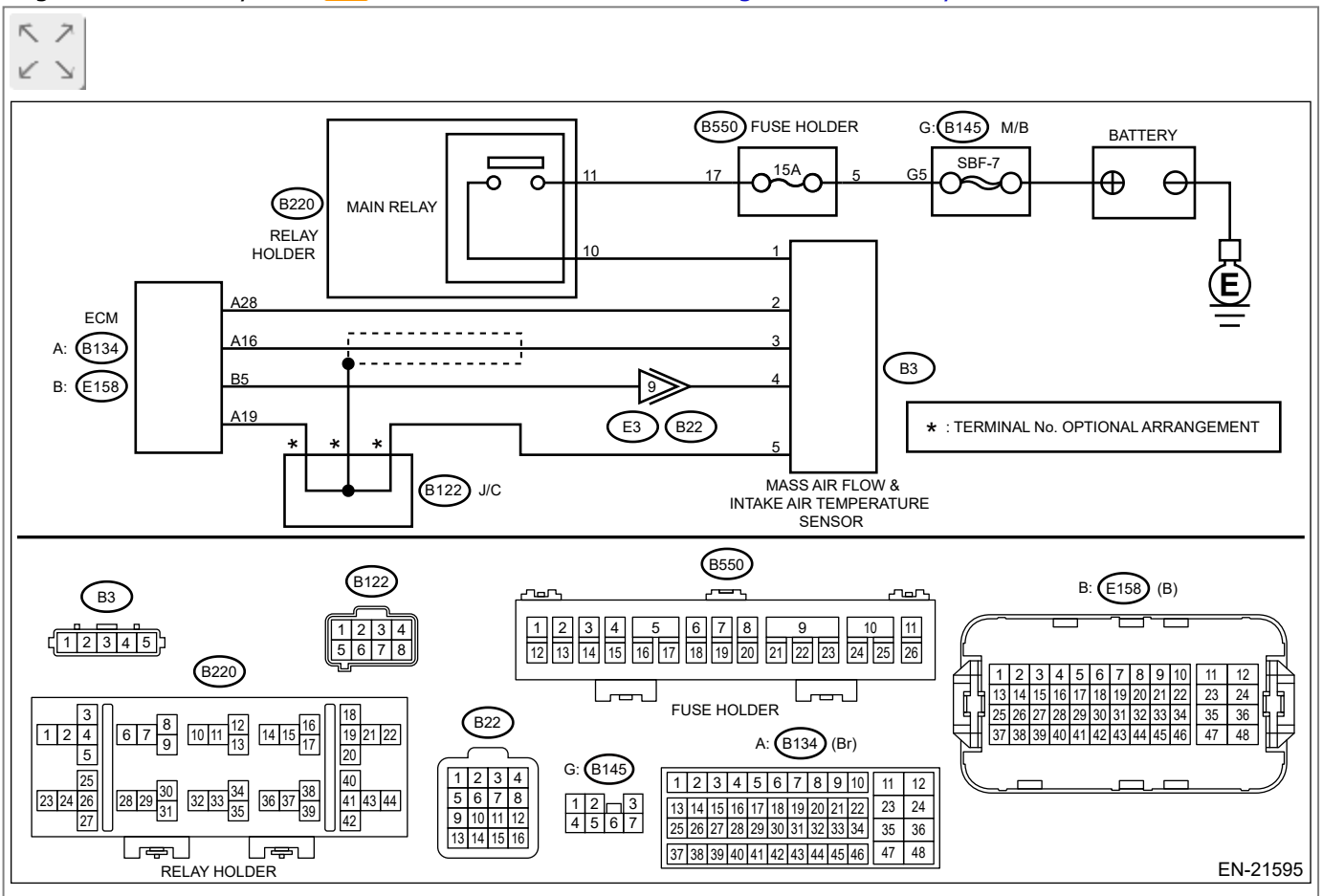
- After servicing or replacing faulty parts, perform **Clear Memory**  **Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode**  **Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- Use the check board when measuring the ECM terminal voltage and resistance.

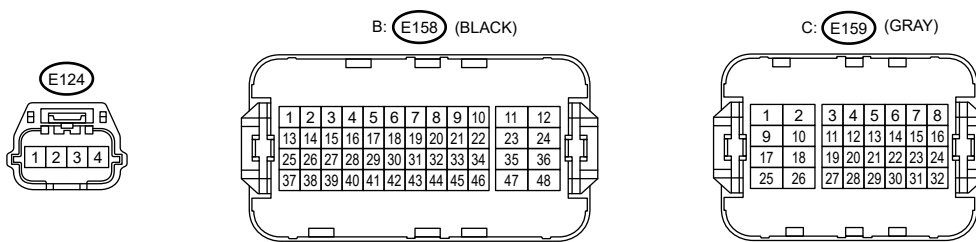
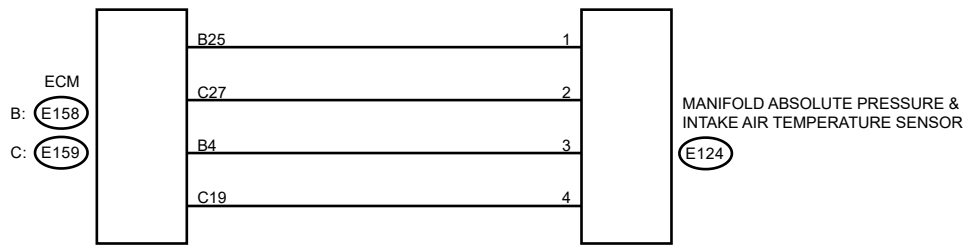
Note:

This DTC may be detected even if fault does not occur in the vehicle. If the customer does not ask for inspection, clear memory instead of inspection and return the vehicle to the user.

Wiring diagram:

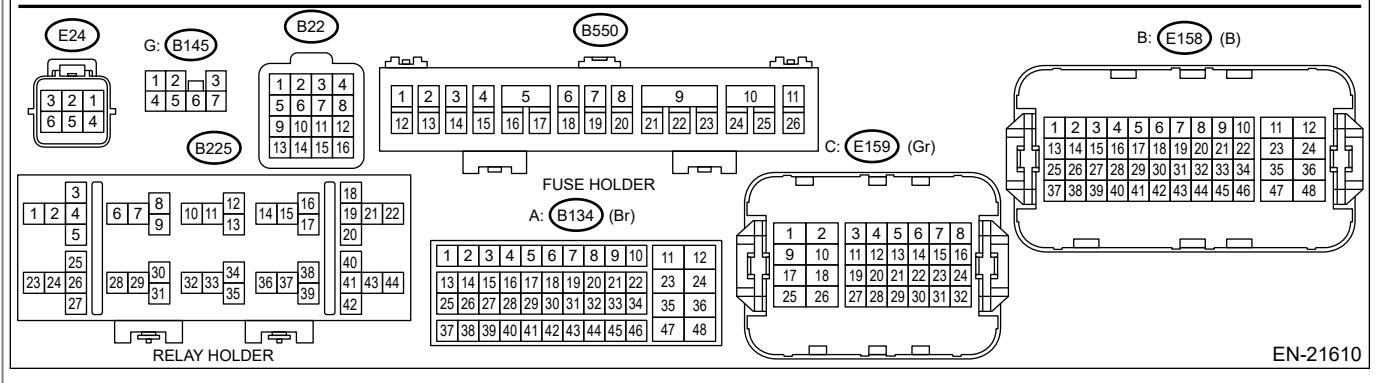
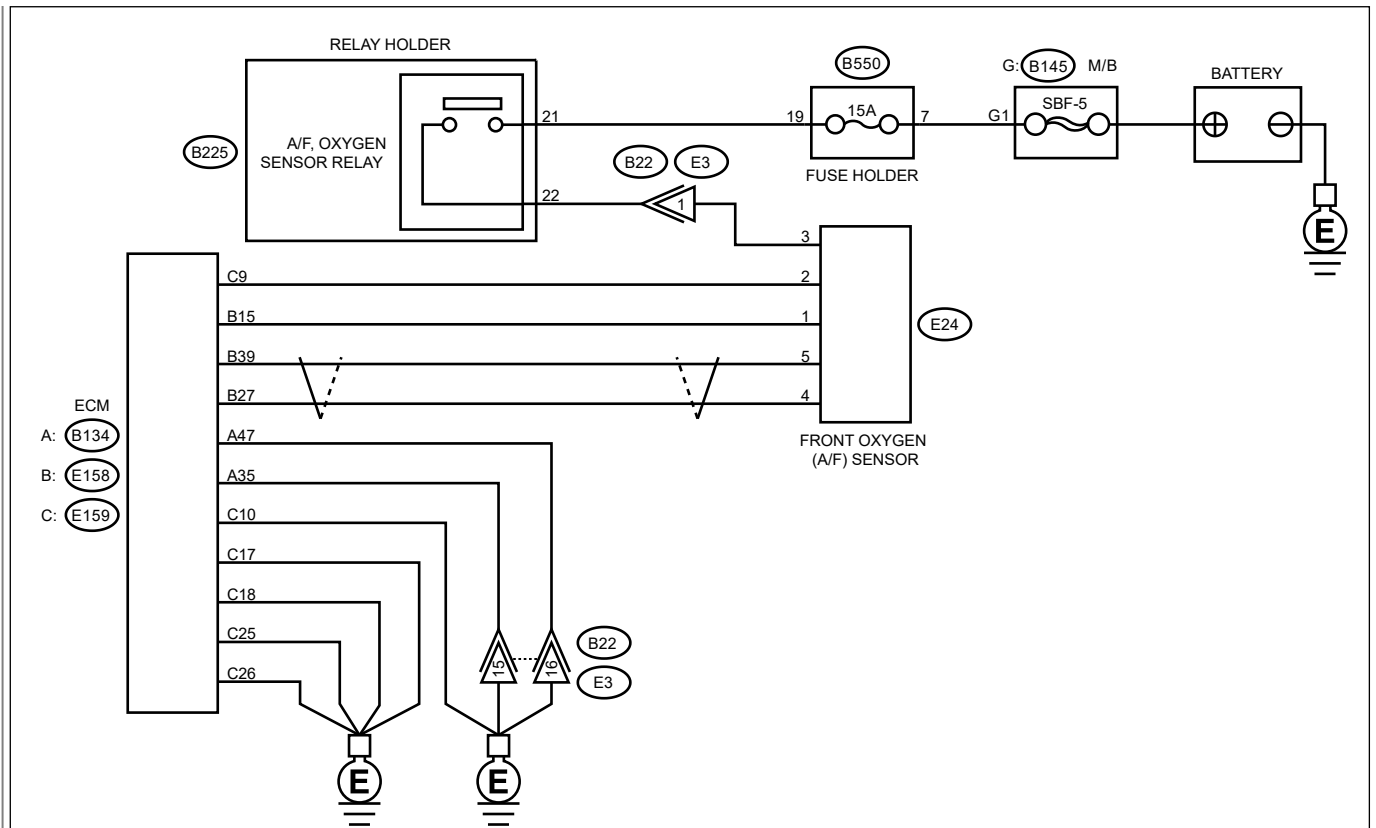
Engine Electrical System  **Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.**





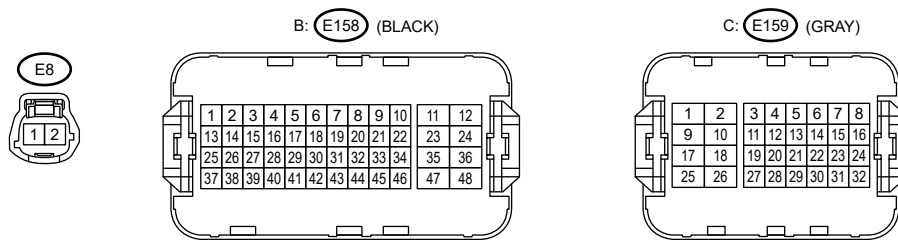
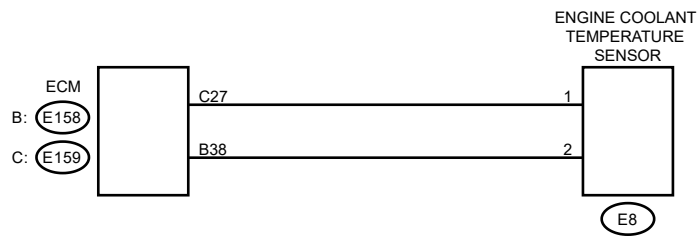
EN-10320



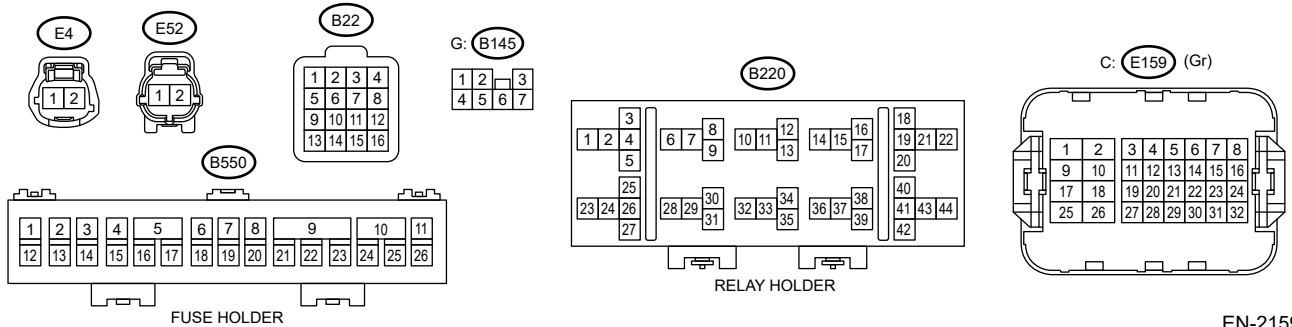
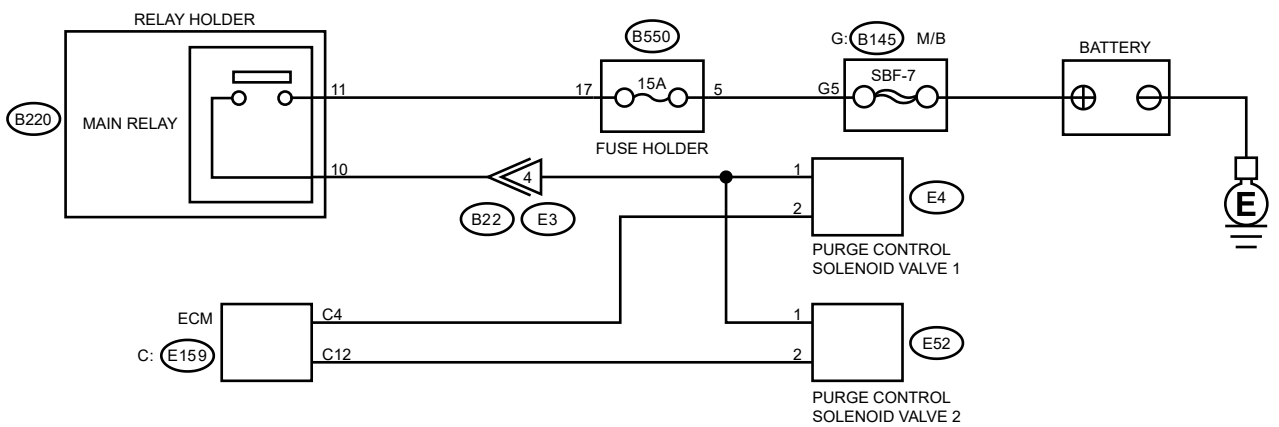


EN-21610



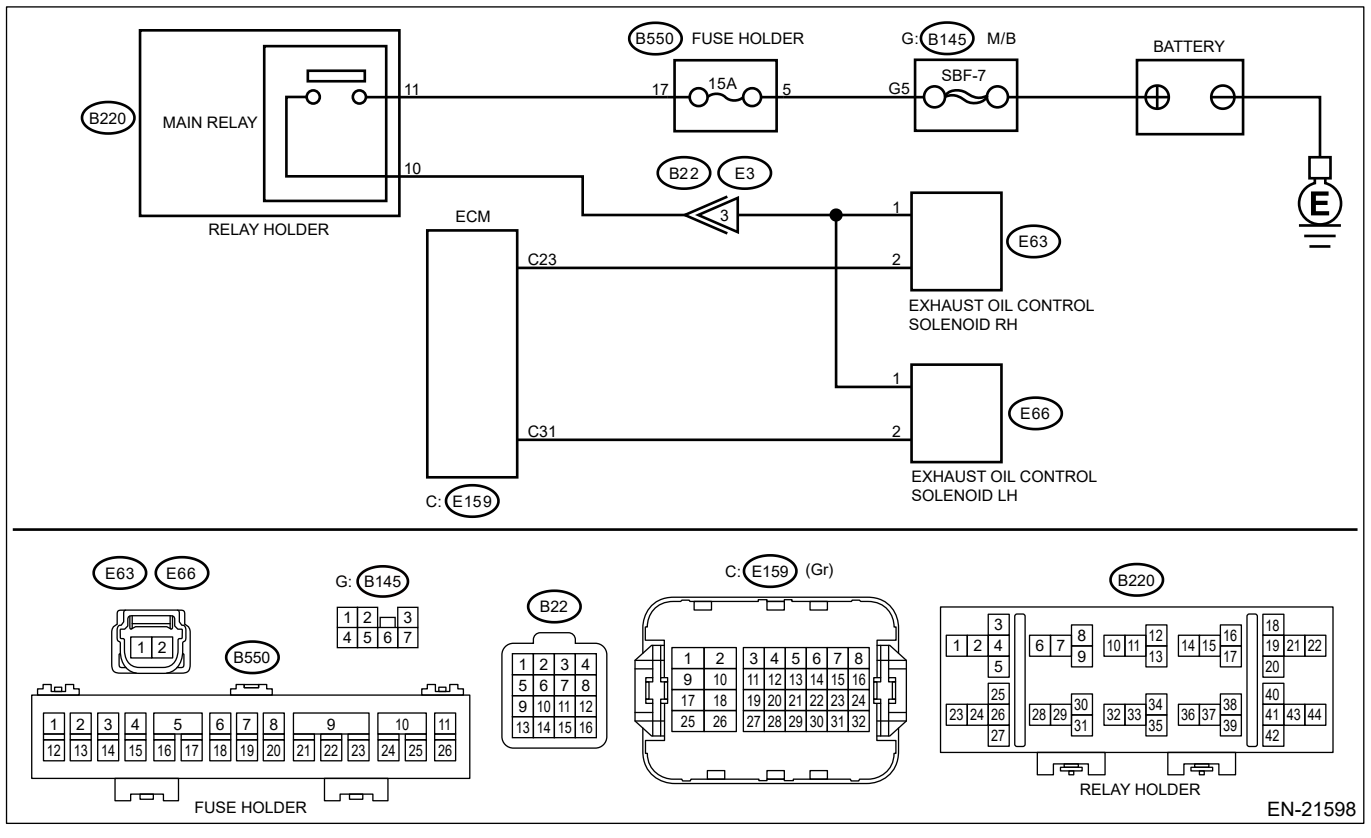
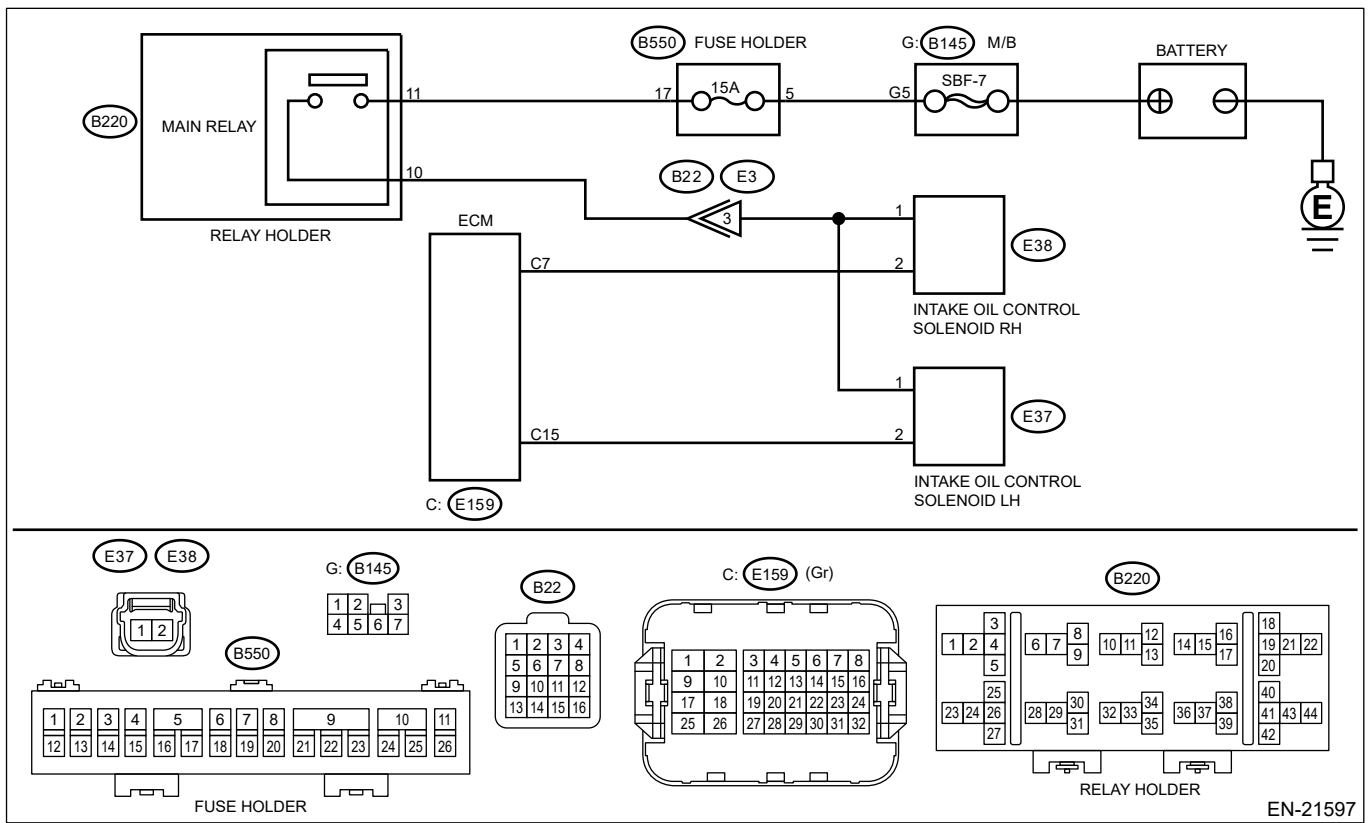


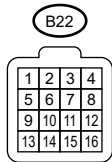
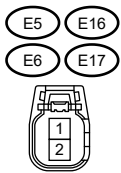
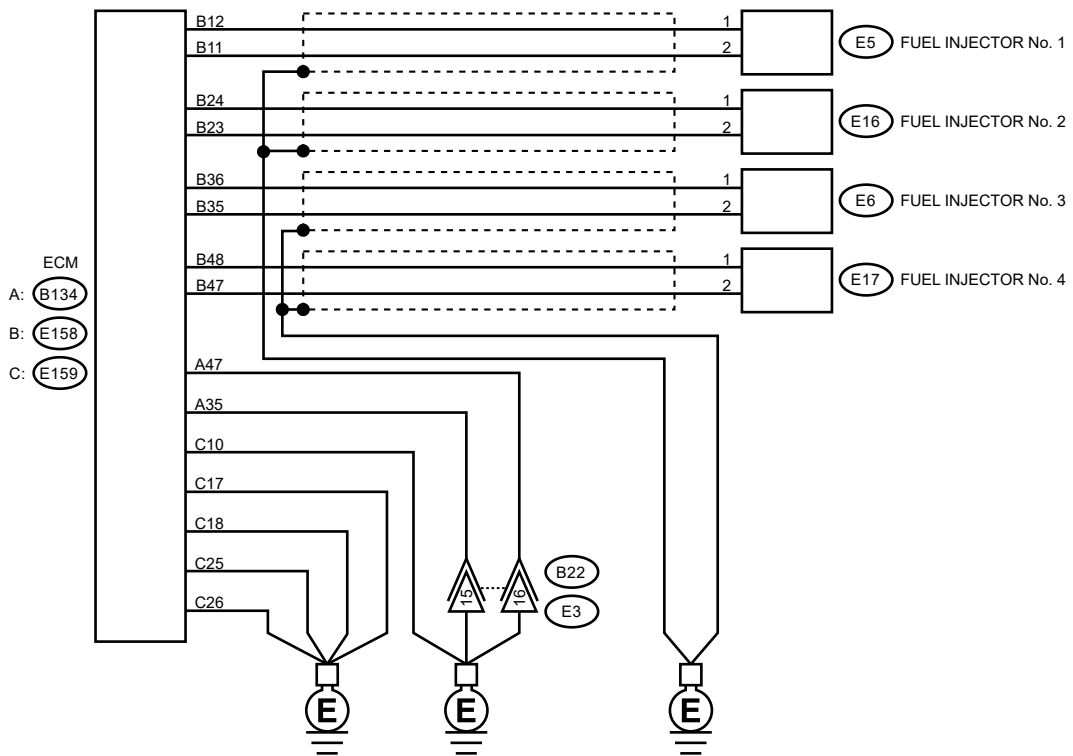
EN-10322



EN-21596



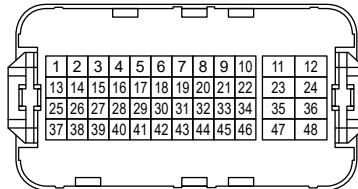




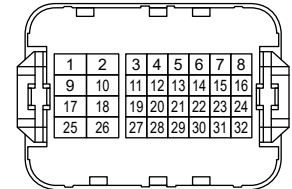
A: (B134) (Br)

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48

B: (E158) (B)



C: (E159) (Gr)



EN-21237

1. CHECK DTC.



Is any other DTC displayed?

Yes

Check DTC using "List of Diagnostic Trouble Code (DTC)". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


[Go to 2.](#)

2. CHECK FREEZE FRAME DATA.



Using the Subaru Select Monitor, read the value in [Fuel Level Input].

Note:


For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [Fuel Level Input] 16.4% or more?

Yes

 [Go to 3.](#)

No


Fuel may be run out. If the fault occurs after refueling, continue the diagnosis.  [Go to 3.](#)

3. CHECK FREEZE FRAME DATA.




Using the Subaru Select Monitor, read the value in [Control module voltage].

Note:



For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [Control module voltage] 11 V or more?

Yes

 [Go to 4.](#)

No




Check the battery and generator.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery>INSPECTION.](#)  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Generator>INSPECTION.](#)

4. CHECK FOR MALFUNCTION OCCURRENCE.



Did you ask the customer about the driving condition and engine speed status when the fault occurred?

Yes

- The engine speed dropped slowly and then the engine stalled during idling or deceleration:  [Go to 5.](#)
- The engine speed dropped rapidly and then the engine stalled during idling or deceleration:  [Go to 83.](#)
- The engine stalled during standing start, acceleration, or constant speed driving:  [Go to 89.](#)


No

Ask the customer about the driving condition and engine speed status when fault occurred.

5. CHECK FREEZE FRAME DATA.

1. Using the Subaru Select Monitor, read the values in [Short term fuel trim B1] and [Long term fuel trim B1].


Note:

For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)



2. Obtain the sum values of [Short term fuel trim B1] and [Long term fuel trim B1] in each freeze frame data.

Is the sum value of [Short term fuel trim B1] and [Long term fuel trim B1] within $\pm 15\%$ in each freeze frame data?

Yes

 [Go to 56.](#)

No


- More than 15% in each freeze frame data:  [Go to 6.](#)
- Less than -15% in any one of freeze frame data:  [Go to 40.](#)

6. CHECK AIR INTAKE SYSTEM.

Check the installing condition of the air intake system.

Are there holes, loose bolts or disconnection of hose on air intake system?


Yes

Repair the air intake system.  [Ref. to INTAKE \(INDUCTION\) \(H4DOTC\)>General Description.](#)

No


 [Go to 7.](#)

7. CHECK PURGE CONTROL SOLENOID VALVE.


Check purge control solenoid valve 1 and purge control solenoid valve 2.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Purge Control Solenoid Valve>INSPECTION.](#)

Are the purge control solenoid valve 1 and the purge control solenoid valve 2 normal?

Yes

 [Go to 8.](#)


No

Replace the faulty purge control solenoid valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Purge Control Solenoid Valve.](#)

8. CHECK FREEZE FRAME DATA.


Using the Subaru Select Monitor, read the value in [Stop Light Switch].

Note:

For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [Stop Light Switch] OFF in all freeze frame data?

Yes

 [Go to 11.](#)

No

 [Go to 9.](#)

9. CHECK CURRENT DATA.

1. Start the engine and warm up completely.
2. Read the value of [Short term fuel trim B1] both when the brake pedal is released and depressed using Subaru Select Monitor.

Note:


For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Does the value of [Short term fuel trim B1] with the brake pedal depressed increase by 10% or more compared to when the pedal is released?

Yes

Replace the brake booster.  [Ref. to BRAKE>Brake Booster.](#)

No

 [Go to 10.](#)

10. CHECK CURRENT DATA.

1. Start the engine and warm up completely.

2. While reproducing the faulty condition of the vehicle, read the values of [Short term fuel trim B1] and [Long term fuel trim B1] using the Subaru Select Monitor.

3. **Note:**

For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

4. Obtain the sum values of [Short term fuel trim B1] and [Long term fuel trim B1].

Is the sum value of [Short term fuel trim B1] and [Long term fuel trim B1] within $\pm 15\%$?


Yes

 [Go to 11.](#)

No


Replace the brake booster.  [Ref. to BRAKE>Brake Booster.](#)

11. CHECK IGNITION SYSTEM.


Check the ignition system.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostics for Engine Starting Failure>IGNITION CONTROL SYSTEM.](#)

Is the ignition system normal?

Yes

 [Go to 12.](#)


No

Repair the ignition system.  [Ref. to IGNITION\(H4DOTC\)>General Description.](#)

12. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the value in [A/F Sensor #1].

Note:


For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [A/F Sensor #1] 1.00 or more?

Yes


 [Go to 17.](#)

No

 [Go to 13.](#)


13. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.




Check the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor>INSPECTION.](#)

Is the mass air flow and intake air temperature sensor normal?

Yes

 [Go to 14.](#)

No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

14. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR CONNECTOR AND BETWEEN ECM CONNECTOR AND MANIFOLD ABSOLUTE PRESSURE & INTAKE AIR TEMPERATURE SENSOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the manifold absolute pressure and intake air temperature sensor.
3. Disconnect the connectors from the mass air flow and intake air temperature sensor.
4. Disconnect the connector from ECM.
5. Measure the resistance of harness between ECM connector and air flow & intake air temperature sensor connector, and between ECM connector and manifold absolute pressure & intake air temperature sensor.

Connector & terminal

(B134) No. 16 — (B3) No. 3:

(B134) No. 28 — (B3) No. 2:

(E159) No. 19 — (E124) No. 4:

(E158) No. 25 — (E124) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 15.](#)

No

Repair the open circuit in harness between ECM connector and air flow & intake air temperature sensor connector and between ECM connector and manifold absolute pressure & intake air temperature sensor.

15. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR CONNECTOR AND MANIFOLD ABSOLUTE PRESSURE & INTAKE AIR TEMPERATURE SENSOR.



Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(B134) No. 16 — Engine ground:

(B134) No. 28 — Engine ground:

(E158) No. 25 — Engine ground:

(E159) No. 19 — Engine ground:

Is the resistance 1 MΩ or more?

Yes


 [Go to 16.](#)

No


Repair the short circuit to ground in harness between ECM connector and air flow & intake air temperature sensor connector and between ECM connector and manifold absolute pressure & intake air temperature sensor.

16. CHECK CURRENT DATA.




1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor, read the value of [Calculated load value], then compare it with the reference value of [Calculated load value] listed in "Data Monitor" in "Subaru Select Monitor" under "Subaru Select Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Note:


- **The value of Calculated load value changes depending on how the engine internal parts settle in. If the value is out of standard, judge it again by comparing the vehicle with another one with the same specifications and similar conditions such as travel distance.**
- **For detailed procedures, refer to "Data Monitor".**  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Does the value of [Calculated load value] fall between 90 — 110% of the value described in the list?

Yes

 [Go to 21.](#)


No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL](#)

17. CHECK FRONT OXYGEN (A/F) SENSOR DATA.


1. Start the engine and warm up completely.
2. Raise the engine speed up to 2,500 rpm and maintain it for approx. three minutes.
3. Release the accelerator pedal and idle the engine.
4. Using [Injection Quantity Control] in [Active Test], read the value of [A/F Sensor #1] at the increase rate of both 12% and –12%.

Note:


- Perform the operation immediately after the engine comes into idling condition, otherwise the front oxygen (A/F) sensor will be cooled.
- For detailed procedures, refer to "Active Test".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Active Test.](#)

Does the value of [A/F Sensor #1] change to less than 0.88 at the increase rate of 12%, and to 1.12 or more at the rate of –12%?

Yes

 [Go to 21.](#)

No

 [Go to 18.](#)

18. CHECK POWER SUPPLY TO FRONT OXYGEN (A/F) SENSOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between front oxygen (A/F) sensor connector and engine ground.

Connector & terminal

(E24) No. 3 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 19.](#)

No

Repair the power supply line.

Note:

In this case, repair the following item:

- Open circuit in harness between A/F, oxygen sensor relay and front oxygen (A/F) sensor connector
- Poor contact of A/F, oxygen sensor relay connector

- **Poor contact of coupling connector**
- **Malfunction of A/F, oxygen sensor relay**

19. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

Connector & terminal

- (E158) No. 15 — (E24) No. 1:
- (E158) No. 27 — (E24) No. 4:
- (E158) No. 39 — (E24) No. 5:
- (E159) No. 9 — (E24) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 20.](#)

No

Repair the open circuit of harness between ECM connector and front oxygen (A/F) sensor connector.

20. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

Measure the resistance between the ECM connector and engine ground.

Note:


Connect all connectors after measurement.

Connector & terminal

- (E158) No. 15 — Engine ground:
- (E158) No. 27 — Engine ground:
- (E158) No. 39 — Engine ground:
- (E159) No. 9 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 21.](#)


No

Repair the short circuit to ground in harness between ECM connector and front oxygen (A/F) sensor connector.

21. CHECK FREEZE FRAME DATA.


Using the Subaru Select Monitor, read the values in [Coolant Temp.] and [Ambient air temperature].

Note:

For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [Coolant Temp.] 120°C (24°F) or more? Or is the value of [Coolant Temp.] 15°C (27°F) or more lower than that of [Ambient air temperature]?

Yes

 [Go to 22.](#)

No


 [Go to 25.](#)

22. CHECK ENGINE COOLANT TEMPERATURE SENSOR.


Check the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Coolant Temperature Sensor>INSPECTION.](#)

Is the engine coolant temperature sensor normal?

Yes

 [Go to 23.](#)

No

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Coolant Temperature Sensor.](#)

23. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the engine coolant temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and engine coolant temperature sensor connector.


Connector & terminal

(E159) No. 27 — (E8) No. 1:

(E158) No. 38 — (E8) No. 2:

Is the resistance less than 1 Ω?

Yes

 [Go to 24.](#)

No

Repair the open circuit of the harness between the ECM connector and engine coolant temperature sensor connector.

24. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.

Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.


Connector & terminal

(E158) No. 38 — Engine ground:

(E159) No. 27 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 25.](#)


No

Repair the short circuit to ground in harness between ECM connector and engine coolant temperature sensor connector.

25. CHECK FREEZE FRAME DATA.


Using the Subaru Select Monitor, read the value in [Evap Purge Flow].

Note:


For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [Evap Purge Flow] 0% in all freeze frame data?

Yes

 [Go to 35.](#)

No

 [Go to 26.](#)

26. CHECK PURGE CONTROL SOLENOID VALVE 1.

1. On the [Active Test] item, select [CPC Solenoid 2] and switch over between ON/OFF.


Note:

For detailed procedures, refer to "Active Test".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Active Test.](#)


2. Check if the ventilation changes according to ON/OFF switching operation.

Does the ventilation of purge control solenoid valve 1 change correctly?

Yes

 [Go to 30.](#)

No

 [Go to 27.](#)

27. CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE 1 CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from purge control solenoid valve 1.
3. Turn the ignition switch to ON.
4. Measure the voltage between purge control solenoid valve 1 connector and engine ground.

Connector & terminal

(E4) No. 1 (+) – Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 28.](#)

No

Repair the power supply circuit.

28. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE 1 CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and purge control solenoid valve 1 connector.

Connector & terminal

(E159) No. 4 – (E4) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 29.](#)

Repair the open circuit in harness between ECM connector and purge control

No

solenoid valve 1 connector.

29. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE 1 CONNECTOR.




Measure the resistance between the purge control solenoid valve 1 connector and engine ground.

Connector & terminal

(E4) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 30.](#)

No


Repair the ground short circuit of harness between ECM connector and purge control solenoid valve 1 connector.

30. CHECK PURGE CONTROL SOLENOID VALVE 2.



1. Connect all connectors.
2. On the [Active Test] item, select [CPC Solenoid 2] and switch over between ON/OFF.


Note:

For detailed procedures, refer to "Active Test".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Active Test.](#)


3. Check if the ventilation changes according to ON/OFF switching operation.

Does the ventilation of purge control solenoid valve 2 change correctly?

Yes

 [Go to 35.](#)

No

 [Go to 31.](#)

31. CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE 2 CONNECTOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from purge control solenoid valve 2.
3. Turn the ignition switch to ON.
4. Measure the voltage between purge control solenoid valve 2 connector and engine ground.

Connector & terminal

(E52) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 32.](#)

No

Repair the power supply circuit.

32. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE 2 CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and purge control solenoid valve 2 connector.

Connector & terminal

(E159) No. 12 — (E52) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 33.](#)

No

Repair the open circuit in harness between ECM connector and purge control solenoid valve 2 connector.

33. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE 2 CONNECTOR.

Measure the resistance between the purge control solenoid valve 2 connector and engine ground.

Note:


Connect all connectors after measurement.

Connector & terminal

(E52) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 34.](#)

No

Repair the ground short circuit of harness between ECM connector and purge control solenoid valve 2 connector.

34. CHECK FOR POOR CONTACT.



Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes

Repair the poor contact of ECM connector.

No

Replace the ECM. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

35. CHECK OF FUEL PUMP.



1. On the [Active Test] item, select [Fuel Pump Relay] and switch over between ON/OFF.

Note:

For detailed procedures, refer to "Active Test". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Active Test.](#)

2. Check if operating sound occurs in the fuel pump according to ON/OFF switching operation.

Does the fuel pump emit operating sound?

Yes

[Go to 37.](#)

No

[Go to 36.](#)

36. CHECK OF FUEL PUMP.



Check fuel pump. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pump>INSPECTION.](#)

Is the fuel pump normal?

Yes

Check fuel pump system. [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0230 FUEL PUMP PRIMARY CIRCUIT.](#)

No

Replace the fuel pump. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Pump.](#)

37. CHECK FUEL TANK.



Check if any foreign matters such as iron powder exist in the fuel tank.

Is there any foreign matter in the fuel tank?

Yes

Remove foreign matter from the fuel tank.

No

[Go to 38.](#)

38. CHECK FUEL PRESSURE.



Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.

Measure the fuel pressure. [Ref. to MECHANICAL\(H4DOTC\)>Fuel Pressure>INSPECTION.](#)

Caution:

Release fuel pressure before removing the fuel pressure gauge.

Is the measured value 340 — 400 kPa (3.5 — 4.1 kgf/cm², 49 — 58 psi)?

Yes

[Go to 39.](#)

No

Check the fuel pump and fuel delivery line. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pump>INSPECTION.](#) [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Delivery and Evaporation Lines>INSPECTION.](#)

39. CHECK FREEZE FRAME DATA.



Using the Subaru Select Monitor, read the values in [Fuel Rail Pressure A] and [Commanded Fuel Rail Pressure A].

Note:

For detailed operation procedures, refer to "Freeze Frame Data". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)


Is the value in [Fuel Rail Pressure A] synchronized with the one in [Commanded Fuel Rail Pressure A] in all freeze frame data?




Yes

Clear the memory to complete.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)

No


Check the high-pressure fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>High Pressure Fuel Pump>INSPECTION.](#)

40. CHECK IGNITION SYSTEM.


Check the ignition system.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostics for Engine Starting Failure>IGNITION CONTROL SYSTEM.](#)

Is the ignition system normal?


Yes

 [Go to 41.](#)


No

Repair the ignition system.  [Ref. to IGNITION\(H4DOTC\)>General Description.](#)

41. CHECK FREEZE FRAME DATA.


Using the Subaru Select Monitor, read the value of Calculated load value, then compare it with the reference value of [Calculated load value] listed in "Data Monitor" under "Subaru Select Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Note:


- **The value of Calculated load value changes depending on how the engine internal parts settle in. If the value is out of standard, judge it again by comparing the vehicle with another one with the same specifications and similar conditions such as travel distance.**
- **For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)**

Is the value of Calculated load value 110% or more of the value described in the list?

Yes

 [Go to 43.](#)


No

 [Go to 42.](#)

42. CHECK FREEZE FRAME DATA.


Using the Subaru Select Monitor, read the value in [A/F Sensor #1].

Note:

For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value in [A/F Sensor #1] less than 1.00?



Yes

 [Go to 47.](#)

No


 [Go to 52.](#)

43. CHECK AIR FLOW & INTAKE AIR TEMPERATURE SENSOR AND MANIFOLD ABSOLUTE PRESSURE & INTAKE AIR TEMPERATURE SENSOR.



Check air flow & intake air temperature sensor and manifold absolute pressure & intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Manifold Absolute Pressure and Intake Air Temperature Sensor>INSPECTION.](#)

Are air flow & intake air temperature sensor and manifold absolute pressure & intake air temperature sensor normal?

Yes

 [Go to 44.](#)

No

Replace air flow & intake air temperature sensor or manifold absolute pressure & intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Manifold Absolute Pressure and Intake Air Temperature Sensor.](#)

44. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR AND MANIFOLD ABSOLUTE PRESSURE & INTAKE AIR TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the manifold absolute pressure and intake air temperature sensor.
3. Disconnect the connectors from the mass air flow and intake air temperature sensor.
4. Disconnect the connector from ECM.

- 5.** Measure the resistance of harness between ECM connector and air flow & intake air temperature sensor connector, and between ECM connector and manifold absolute pressure & intake air temperature sensor.

Connector & terminal

(B134) No. 16 — (B3) No. 3:


(B134) No. 28 — (B3) No. 2:

(E159) No. 19 — (E124) No. 4:

(E158) No. 25 — (E124) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 45.](#)

No

Repair the open circuit in harness between ECM connector and air flow & intake air temperature sensor connector and between ECM connector and manifold absolute pressure & intake air temperature sensor.

45. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR AND MANIFOLD ABSOLUTE PRESSURE & INTAKE AIR TEMPERATURE SENSOR CONNECTOR.



Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(B134) No. 16 — Engine ground:

(B134) No. 28 — Engine ground:

(E158) No. 25 — Engine ground:

(E159) No. 19 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 46.](#)


No

Repair the short circuit to ground in harness between ECM connector and air flow & intake air temperature sensor connector and between ECM connector and manifold absolute pressure & intake air temperature sensor.


46. CHECK CURRENT DATA.



1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor, read the value of [Calculated load value], then compare it with the reference value of [Calculated load value] listed in "Data Monitor"


under "Subaru Select Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Note:


- **The value of Calculated load value changes depending on how the engine internal parts settle in. If the value is out of standard, judge it again by comparing the vehicle with another one with the same specifications and similar conditions such as travel distance.**
- **For detailed procedures, refer to "Data Monitor".**  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Does the value of [Calculated load value] fall between 90 — 110% of the value described in the list?

Yes

 [Go to 47.](#)


No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

47. CHECK CURRENT DATA.


1. Start the engine and warm up completely.
2. Raise the engine speed up to 2,500rpm and maintain it for approx. three minutes.
3. Release the accelerator pedal and idle the engine.
4. Using [Injection Quantity Control] in [Active Test], read the value of [A/F Sensor #1] at the increase rate of both 12% and –12%.

Note:


- **Perform the operation immediately after the engine comes into idling condition, otherwise the front oxygen (A/F) sensor will be cooled.**
- **For detailed procedures, refer to "Active Test".**  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Active Test.](#)

Does the value of [A/F Sensor #1] change to less than 0.88 at the increase rate of 12%, and to 1.12 or more at the rate of –12%?

Yes

 [Go to 52.](#)


No

 [Go to 48.](#)

48. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the value in [A/F Sensor #1 Resistance].

Note:


For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [A/F Sensor #1 Resistance] 500 Ω or more?

Yes

Replace the front oxygen (A/F) sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Front Oxygen \(A/F\) Sensor.](#)

No

 [Go to 49.](#)

49. CHECK POWER SUPPLY TO FRONT OXYGEN (A/F) SENSOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between front oxygen (A/F) sensor connector and engine ground.

Connector & terminal

(E24) No. 3 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 50.](#)

No

Repair the power supply line.

Note:

In this case, repair the following item:

- Open circuit in harness between A/F, oxygen sensor relay and front oxygen (A/F) sensor connector
- Poor contact of A/F, oxygen sensor relay connector
- Poor contact of coupling connector
- Malfunction of A/F, oxygen sensor relay

50. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

Connector & terminal

(E158) No. 15 — (E24) No. 1:


(E158) No. 27 — (E24) No. 4:

(E158) No. 39 — (E24) No. 5:

(E159) No. 9 — (E24) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 51.](#)

No

Repair the open circuit of harness between ECM connector and front oxygen (A/F) sensor connector.

51. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E158) No. 15 — Engine ground:


(E158) No. 27 — Engine ground:

(E158) No. 39 — Engine ground:

(E159) No. 9 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 52.](#)


No

Repair the short circuit to ground in harness between ECM connector and front oxygen (A/F) sensor connector.

52. CHECK FREEZE FRAME DATA.


Using the Subaru Select Monitor, read the values in [Coolant Temp.] and [Ambient air temperature].

Note:

For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [Coolant Temp.] 120°C (248°F) or more? Or is the value of [Coolant Temp.] lower than that of [Ambient air temperature] by 15°C (27°F) or more?

Yes

 [Go to 53.](#)

No


Clear the memory to complete.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Clear Memory Mode.](#)

53. CHECK ENGINE COOLANT TEMPERATURE SENSOR.


Check the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Coolant Temperature Sensor>INSPECTION.](#)

Is the engine coolant temperature sensor normal?

Yes

 [Go to 54.](#)

No

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Coolant Temperature Sensor.](#)

54. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the engine coolant temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and engine coolant temperature sensor connector.


Connector & terminal

(E159) No. 27 — (E8) No. 1:

(E158) No. 38 — (E8) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 55.](#)

No

Repair the open circuit of the harness between the ECM connector and engine coolant temperature sensor connector.

55. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.

Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E158) No. 38 — Engine ground:

(E159) No. 27 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

Even if DTC is detected, it has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.


Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No


Repair the short circuit to ground in harness between ECM connector and engine coolant temperature sensor connector.

56. CHECK IGNITION SYSTEM.


Check the ignition system.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostics for Engine Starting Failure>IGNITION CONTROL SYSTEM.](#)

Is the ignition system normal?

Yes

 [Go to 57.](#)


No

Repair the ignition system.  [Ref. to IGNITION\(H4DOTC\)>General Description.](#)

57. CHECK FREEZE FRAME DATA.

1. Using the Subaru Select Monitor, read the values of the Freeze Frame Data in [Idle Mass Air Flow Feedback correct], [ISC Learning Value] and [Idle dirty throttle correct].

Note:

For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

2. Obtain the sum values of [Idle Mass Air Flow Feedback correct], [ISC Learning Value] and [Idle dirty throttle correct].
3. Start the engine and warm up completely.
4. Using Subaru Select Monitor, read the values of Idle Mass Air Flow Feedback correct, ISC Learning Value and Idle dirty throttle correct in current data at normal idling.


Note:

For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)


5. Obtain the sum values of [Idle Mass Air Flow Feedback correct], [ISC Learning Value] and [Idle dirty throttle correct].

Is the sum value of freeze frame data less than 80% of the sum value of current data?

Yes

 [Go to 58.](#)

No

 [Go to 60.](#)

58. CHECK AIR INTAKE SYSTEM.


Check the installing condition of the air intake system.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes









Repair the air intake system.  [Ref. to INTAKE \(INDUCTION\) \(H4DOTC\)>General Description.](#)

No

 [Go to 59.](#)


59. CHECK AIR INTAKE SYSTEM.

Check the air intake system related parts.

- Brake booster:  [Ref. to BRAKE>Brake Booster>INSPECTION.](#)
- Mass air flow and intake air temperature sensor:  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor>INSPECTION.](#)
- PCV pipe:  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\) \(H4DOTC\)>PCV Pipe>INSPECTION.](#)
- PCV connector:  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\) \(H4DOTC\)>PCV Connector>INSPECTION.](#)
- PCV hose:  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\) \(H4DOTC\)>PCV Hose>INSPECTION.](#)
- PCV hose assembly:  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>PCV Hose>INSPECTION.](#)
- PCV valve:  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\) \(H4DOTC\)>PCV Valve>INSPECTION.](#)
- Purge control solenoid valve 1 and purge control solenoid valve 2:  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Purge Control Solenoid Valve>INSPECTION.](#)

Are all of the air intake system related parts normal?

Yes

 [Go to 78.](#)


No

Replace the parts if defective.

60. CHECK FREEZE FRAME DATA.

1. Using the Subaru Select Monitor, read the values in [VVT Adv. Ang. Amount R], [VVT Advance Target Angle Amount R], [VVT Adv. Ang. Amount L], [VVT Advance Target Angle Amount L], [Exh. VVT Retard Ang. R], [Ex VVT Retard Target Angle R], [Exh. VVT Retard Ang. L] and [Ex VVT Retard Target Angle L].


Note:

For detailed operation procedures, refer to "Freeze Frame Data".  **[Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)**

2. Using the Subaru Select Monitor, compare the respective values between the followings: [VVT Adv. Ang. Amount R] and [VVT Advance Target Angle Amount R], [VVT Adv. Ang. Amount L] and [VVT Advance Target Angle Amount L], [Exh. VVT Retard Ang. R] and [Ex VVT Retard Target Angle R], [Exh. VVT Retard Ang. L] and [Ex VVT Retard Target Angle L].

Does all of the advance angle amount and retard angle amount synchronize with their target values?

Yes

 [Go to 78.](#)

No

Diagnose the part that does not synchronize.

- Intake RH:  [Go to 61.](#)
- Intake LH:  [Go to 65.](#)
- Exhaust RH:  [Go to 69.](#)
- Exhaust LH:  [Go to 74.](#)

61. CHECK POWER SUPPLY TO THE INTAKE OIL CONTROL SOLENOID RH.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake oil control solenoid RH.
3. Turn the ignition switch to ON.
4. Measure the voltage between intake oil control solenoid RH connector and engine ground.

Connector & terminal

(E38) No. 1 (+) — Engine ground (—):

Is the voltage 10 V or more?

Yes

 [Go to 62.](#)

No

Repair the power supply circuit.

62. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and intake oil control solenoid RH.

Connector & terminal

(E159) No. 7 — (E38) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 63.](#)

No

Repair the open circuit in harness between ECM connector and intake oil control solenoid RH connector.

63. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH CONNECTOR.

Measure the resistance between intake oil control solenoid RH connector and engine ground.

Note:


Connect all connectors after measurement.

Connector & terminal

(E38) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 64.](#)

No

Repair the short circuit to ground in harness between ECM connector and intake oil control solenoid RH connector.

64. CHECK INTAKE OIL CONTROL SOLENOID RH.



Check the intake oil control solenoid RH. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Oil Control Solenoid>INSPECTION.](#)

Is the intake oil control solenoid RH normal?

Yes

Replace the intake cam sprocket RH. [Ref. to MECHANICAL\(H4DOTC\)>Cam Sprocket.](#)

No

Replace the intake oil control solenoid RH. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)

65. CHECK POWER SUPPLY TO THE INTAKE OIL CONTROL SOLENOID LH.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake oil control solenoid LH.
3. Turn the ignition switch to ON.
4. Measure the voltage between intake oil control solenoid LH connector and engine ground.

Connector & terminal

(E37) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

[Go to 66.](#)

No

Repair the power supply circuit.

66. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH CONNECTOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and intake oil control solenoid LH.

Connector & terminal

(E159) No. 15 — (E37) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 67.](#)

No

Repair the open circuit in harness between ECM connector and intake oil control solenoid LH connector.

67. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH CONNECTOR.

Measure the resistance between intake oil control solenoid LH connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E37) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 68.](#)

No


Repair the short circuit to ground in harness between ECM connector and intake oil control solenoid LH connector.

68. CHECK INTAKE OIL CONTROL SOLENOID LH.


Check the intake oil control solenoid LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Oil Control Solenoid>INSPECTION.](#)

Is the intake oil control solenoid LH normal?

Yes

Replace the intake cam sprocket LH.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Sprocket.](#)

No

Replace the intake oil control solenoid LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)

69. CHECK POWER SUPPLY TO THE EXHAUST OIL CONTROL SOLENOID RH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the exhaust oil control solenoid RH.
3. Turn the ignition switch to ON.
4. Measure the voltage between exhaust oil control solenoid RH connector and engine


ground.

Connector & terminal

(E63) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 70.](#)

No

Repair the power supply circuit.

70. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and exhaust oil control solenoid RH.

Connector & terminal

(E159) No. 23 — (E63) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 71.](#)

No

Repair the open circuit in harness between ECM connector and exhaust oil control solenoid RH connector.

71. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH CONNECTOR.

Measure the resistance between exhaust oil control solenoid RH connector and engine ground.

Note:


Connect all connectors after measurement.

Connector & terminal

(E63) No. 2 — Engine ground

Is the resistance 1 M Ω or more?

Yes

 [Go to 73.](#)

No


Repair the short circuit to ground in harness between ECM connector and

exhaust oil control solenoid RH connector.

72. CHECK FREEZE FRAME DATA.


Using the Subaru Select Monitor, read the values in [Vehicle Speed Sensor], [Engine Speed] and [AT turbine speed].

Note:


For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is there any freeze frame data indicating that the value of [Vehicle Speed Sensor] is less than 30 km/h (18.6 MPH), and that the difference in values between [Engine Speed] and [AT turbine speed] is less than 100 rpm?


Yes

Repair the CVT.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>General Description.](#)

No


 [Go to 88.](#)

73. CHECK EXHAUST OIL CONTROL SOLENOID RH.


Check the exhaust oil control solenoid RH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Oil Control Solenoid>INSPECTION.](#)

Is the exhaust oil control solenoid RH normal?

Yes

Replace the exhaust cam sprocket RH.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Sprocket.](#)

No

Replace the exhaust oil control solenoid RH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)

74. CHECK POWER SUPPLY TO THE EXHAUST OIL CONTROL SOLENOID LH.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from the exhaust oil control solenoid LH.
3. Turn the ignition switch to ON.
4. Measure the voltage between exhaust oil control solenoid LH connector and engine ground.

Connector & terminal

(E66) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 75.](#)

No

Repair the power supply circuit.

75. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and exhaust oil control solenoid LH.

Connector & terminal

(E159) No. 31 — (E66) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 76.](#)

No

Repair the open circuit in harness between ECM connector and exhaust oil control solenoid LH connector.

76. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH CONNECTOR.

Measure the resistance between exhaust oil control solenoid LH connector and engine ground.

Note:


Connect all connectors after measurement.

Connector & terminal

(E66) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?


Yes

 [Go to 77.](#)

No


Repair the short circuit to ground in harness between ECM connector and exhaust oil control solenoid LH connector.

77. CHECK EXHAUST OIL CONTROL SOLENOID LH.


Check the exhaust oil control solenoid LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Oil Control Solenoid>INSPECTION.](#)

Is the exhaust oil control solenoid LH normal?

Yes

Replace the exhaust cam sprocket LH.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Sprocket.](#)

No


Replace the exhaust oil control solenoid LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)

78. CHECK ENGINE COOLANT TEMPERATURE SENSOR.


Check the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Coolant Temperature Sensor>INSPECTION.](#)

Is the engine coolant temperature sensor normal?

Yes

 [Go to 79.](#)

No

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Coolant Temperature Sensor.](#)

79. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the engine coolant temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and engine coolant temperature sensor connector.


Connector & terminal

(E159) No. 27 — (E8) No. 1:

(E158) No. 38 — (E8) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 80.](#)

No

Repair the open circuit of the harness between the ECM connector and engine coolant temperature sensor connector.

80. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.



Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E158) No. 38 — Engine ground:

(E159) No. 27 — Engine ground:

Is the resistance 1 MΩ or more?

Yes


 [Go to 81.](#)

No

Repair the short circuit to ground in harness between ECM connector and engine coolant temperature sensor connector.


81. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.




Check the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor>INSPECTION.](#)

Is the mass air flow and intake air temperature sensor normal?

Yes


 [Go to 82.](#)

No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

82. CHECK MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR.




Check the manifold absolute pressure and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Manifold Absolute Pressure and Intake Air Temperature Sensor>INSPECTION.](#)

Is the manifold absolute pressure and intake air temperature sensor normal?

Yes

Clear the memory to complete.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Clear Memory Mode.](#)

No

Check the manifold absolute pressure and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Manifold Absolute Pressure and Intake Air Temperature Sensor.](#)

83. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and fuel injector connector.

Connector & terminal

- #1 (E158) No. 12 — (E5) No. 1:
- #1 (E158) No. 11 — (E5) No. 2:
- #2 (E158) No. 24 — (E16) No. 1:
- #2 (E158) No. 23 — (E16) No. 2:
- #3 (E158) No. 36 — (E6) No. 1:
- #3 (E158) No. 35 — (E6) No. 2:
- #4 (E158) No. 48 — (E17) No. 1:
- #4 (E158) No. 47 — (E17) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 84.](#)

No

Repair the open circuit of the harness between the ECM connector and fuel injector connector.

84. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.


Connector & terminal

- #1 (E158) No. 12 — Engine ground:
- #1 (E158) No. 11 — Engine ground:

- #2 (E158) No. 24 — Engine ground:
- #2 (E158) No. 23 — Engine ground:
- #3 (E158) No. 36 — Engine ground:
- #3 (E158) No. 35 — Engine ground:
- #4 (E158) No. 48 — Engine ground:
- #4 (E158) No. 47 — Engine ground:

Is the resistance 1 MΩ or more?


Yes

 [Go to 85.](#)

No


Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

85. CHECK IGNITION SYSTEM.


Check the ignition system.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostics for Engine Starting Failure>IGNITION CONTROL SYSTEM.](#)

Is the ignition system normal?

Yes

 [Go to 86.](#)


No

Repair the ignition system.  [Ref. to IGNITION\(H4DOTC\)>General Description.](#)

86. CHECK FREEZE FRAME DATA.


Using the Subaru Select Monitor, read the values in [A/C Compressor Signal] and [Idle A/C load correct].

Note:


For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Do both values of [A/C Compressor Signal] and [Idle A/C load correct] increase?

Yes

Check the air conditioner.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostics with Phenomenon.](#)


No


 [Go to 87.](#)

87. CHECK FREEZE FRAME DATA.

1. Using the Subaru Select Monitor, read the value in [Electric Load Feedback Val].

Note:

For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)


2. Compare the value of [Electric Load Feedback Val] with that of ISC Learning Value, which is described in "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Note:


For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Is the value of [Electric Load Feedback Val] 20% or more compared to that of ISC Learning Value?


Yes

Check the generator and power assisted system.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Generator.](#)

No

 [Go to 72.](#)

88. CHECK DTC.

Is DTC of CVT displayed?  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".

No

Even if DTC is detected, it has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.


Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

89. CHECK FREEZE FRAME DATA.


Using the Subaru Select Monitor, read the values in [Calculated load value] and [Relative Throttle Position].

Note:


For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [Calculated load value] decreasing while that of [Relative Throttle Position] is increasing?


Yes

 [Go to 90.](#)

No


 [Go to 94.](#)

90. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.


Check the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor>INSPECTION.](#)

Is the mass air flow and intake air temperature sensor normal?

Yes

 [Go to 91.](#)

No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

91. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the mass air flow and intake air temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and the mass air flow and intake air temperature sensor connector.


Connector & terminal

(B134) No. 16 — (B3) No. 3:

(B134) No. 28 — (B3) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 92.](#)

No

Repair the open circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

92. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR.



Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(B134) No. 16 — Engine ground:

(B134) No. 28 — Engine ground:

Is the resistance 1 MΩ or more?

Yes


 [Go to 93.](#)

No


Repair the ground short circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

93. CHECK CURRENT DATA.




1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor, read the value of [Calculated load value], then compare it with the reference value of [Calculated load value] listed in "Data Monitor" under "Subaru Select Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Note:


- **The value of Calculated load value changes depending on how the engine internal parts settle in. If the value is out of standard, judge it again by comparing the vehicle with another one with the same specifications and similar conditions such as travel distance.**
- **For detailed procedures, refer to "Data Monitor".**  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Does the value of [Calculated load value] fall between 90 — 110% of the value described in the list?

Yes

 [Go to 94.](#)

No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air](#)

94. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and fuel injector connector.

Connector & terminal

- #1 (E158) No. 12 — (E5) No. 1:
- #1 (E158) No. 11 — (E5) No. 2:
- #2 (E158) No. 24 — (E16) No. 1:
- #2 (E158) No. 23 — (E16) No. 2:
- #3 (E158) No. 36 — (E6) No. 1:
- #3 (E158) No. 35 — (E6) No. 2:
- #4 (E158) No. 48 — (E17) No. 1:
- #4 (E158) No. 47 — (E17) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 95.](#)

No

Repair the open circuit of the harness between the ECM connector and fuel injector connector.

95. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

Measure the resistance between the ECM connector and engine ground.

Note:


Connect all connectors after measurement.

Connector & terminal

- #1 (E158) No. 12 — Engine ground:
- #1 (E158) No. 11 — Engine ground:
- #2 (E158) No. 24 — Engine ground:
- #2 (E158) No. 23 — Engine ground:
- #3 (E158) No. 36 — Engine ground:
- #3 (E158) No. 35 — Engine ground:
- #4 (E158) No. 48 — Engine ground:
- #4 (E158) No. 47 — Engine ground:

Is the resistance 1 M Ω or more?


Yes

 [Go to 96.](#)

No


Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

96. CHECK IGNITION SYSTEM.


Check the ignition system.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostics for Engine Starting Failure>IGNITION CONTROL SYSTEM.](#)

Is the ignition system normal?

Yes

 [Go to 97.](#)

No

Repair the ignition system.  [Ref. to IGNITION\(H4DOTC\)>General Description.](#)

97. CHECK OF FUEL PUMP.

1. On the [Active Test] item, select [Fuel Pump Control (ON/OFF Dr.)] and switch over between ON/OFF for the fuel pump.


Note:

For detailed procedures, refer to "Active Test".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Active Test.](#)


2. Check if operating sound occurs in the fuel pump according to ON/OFF switching operation.

Does the fuel pump emit operating sound?


Yes

 [Go to 99.](#)

No


 [Go to 98.](#)

98. CHECK OF FUEL PUMP.


Check fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pump>INSPECTION.](#)

Is the fuel pump normal?

Yes

Check fuel pump system.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0230 FUEL PUMP PRIMARY CIRCUIT.](#)

No

Replace the fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Pump.](#)

99. CHECK FUEL TANK.


Check if any foreign matters such as iron powder exist in the fuel tank.

Is there any foreign matter in the fuel tank?

Yes

Remove foreign matter from the fuel tank.

No

 [Go to 100.](#)


100. CHECK FUEL PRESSURE.

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.


Measure the fuel pressure.  [Ref. to MECHANICAL\(H4DOTC\)>Fuel Pressure>INSPECTION.](#)

Caution:



Release fuel pressure before removing the fuel pressure gauge.

Is the measured value 340 — 400 kPa (3.5 — 4.1 kgf/cm², 49 — 58 psi)?

Yes

 [Go to 101.](#)


No

Check the fuel pump and fuel delivery line.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pump>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Delivery and Evaporation Lines>INSPECTION.](#)

101. CHECK FREEZE FRAME DATA.


Using the Subaru Select Monitor, read the values in [Fuel Rail Pressure A] and [Commanded Fuel Rail Pressure A].

Note:

For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value in [Fuel Rail Pressure A] synchronized with the one in [Commanded Fuel Rail Pressure A] in all freeze frame data?

Yes

 [Go to 102.](#)

No

Check the high-pressure fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>High Pressure Fuel Pump>INSPECTION.](#)

102. CHECK ENGINE RUNNING CONDITION.


Check the engine running condition using the cylinder monitor for the respective cylinders in the Subaru Select Monitor.

Note:

For detailed operation procedures, refer to "PC application help for Subaru Select Monitor".

Is there a large difference in the speed between each cylinder?

Yes

It is possible that the compression pressure of the engine is not sufficient. Check the engine.  [Ref. to MECHANICAL\(H4DOTC\)>Symptoms and causes>INSPECTION.](#)

No

Clear the memory to complete.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)

1. OUTLINE OF DIAGNOSIS

Judge as NG when the engine stops except by operating the ignition switch after starting the engine.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Engine condition	After engine starting

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously after the enable conditions have been established.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Engine speed	< 300 rpm

Time needed for diagnosis: 60 ms

Malfunction Indicator Light Illumination: Does not illuminate.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1604 STARTABILITY MALFUNCTION

DTC detecting condition:

Immediately at fault recognition

Caution:

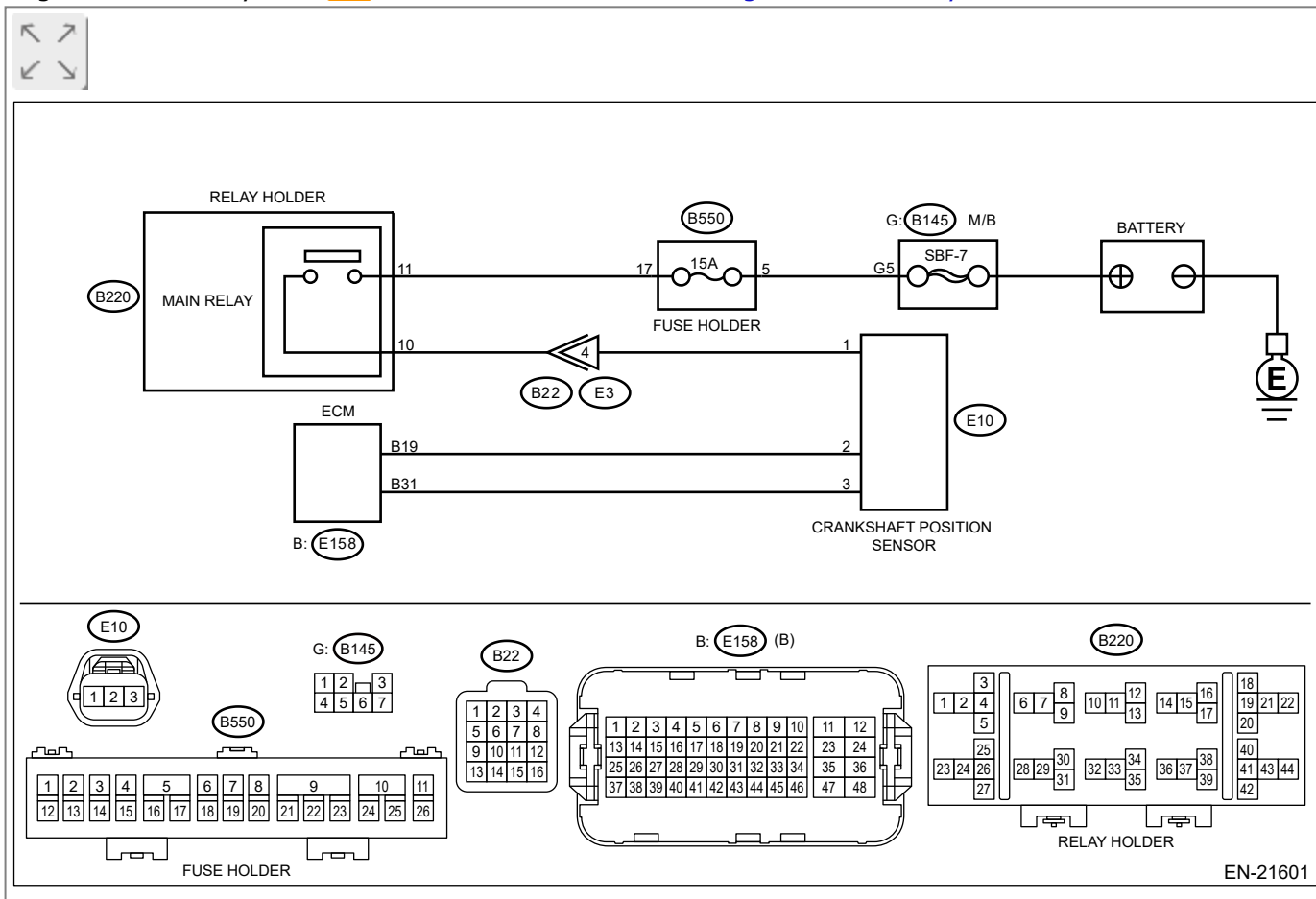
- After servicing or replacing faulty parts, perform **Clear Memory**  Ref. to **ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode**  Ref. to **ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- Use the check board when measuring the ECM terminal voltage and resistance.

Note:

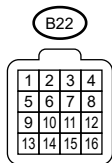
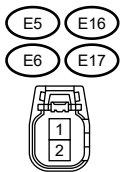
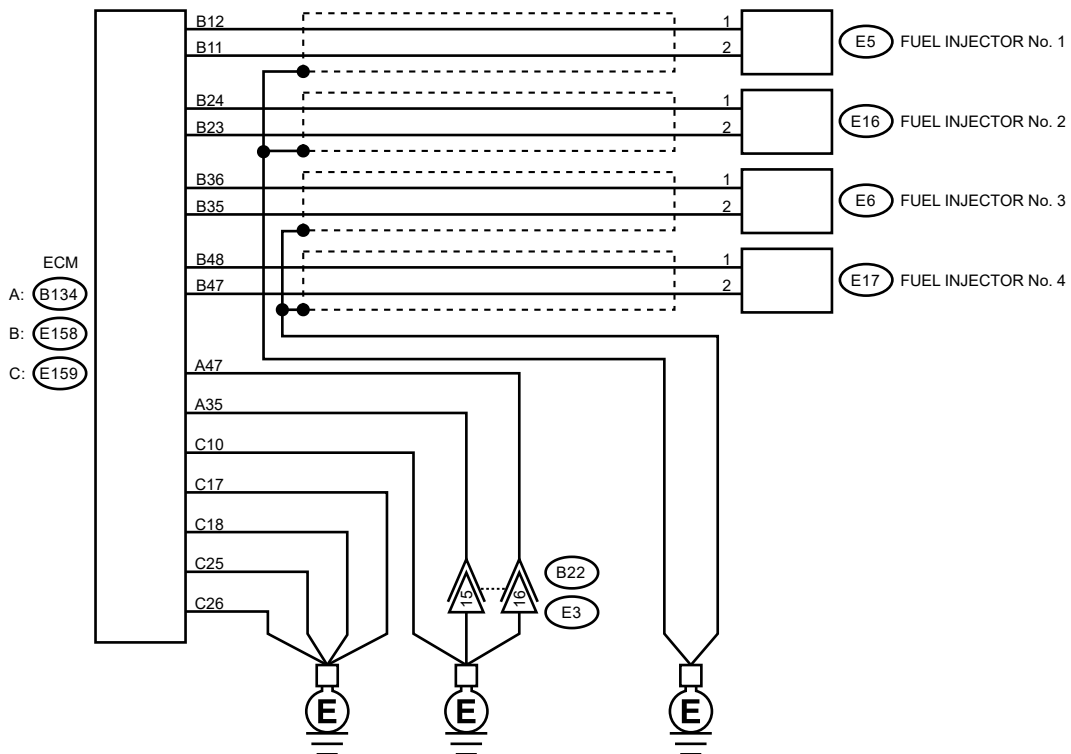
This DTC may be detected even if fault does not occur in the vehicle. If the customer does not ask for inspection, clear memory instead of inspection and return the vehicle to the user.

Wiring diagram

Engine Electrical System  Ref. to **WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.**



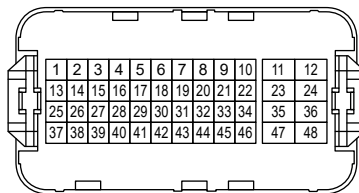
EN-21601



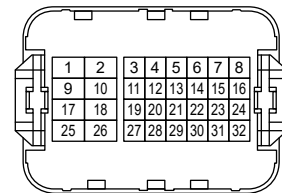
A: B134 (Br)

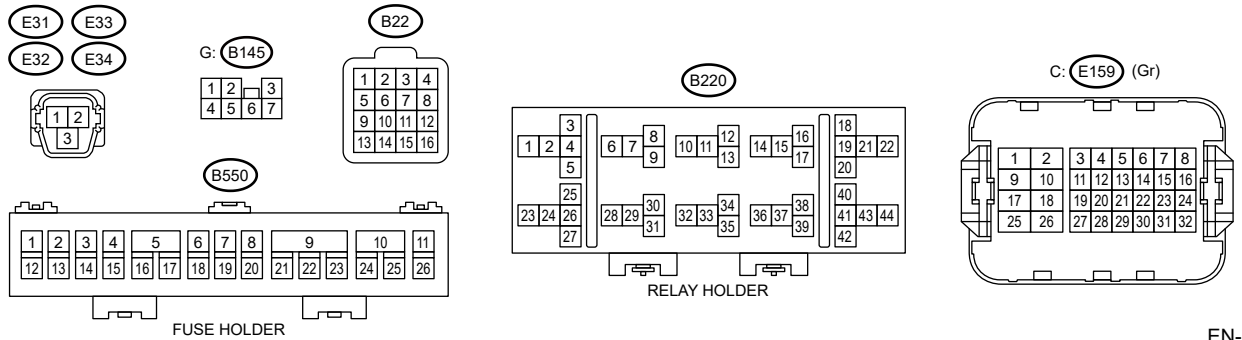
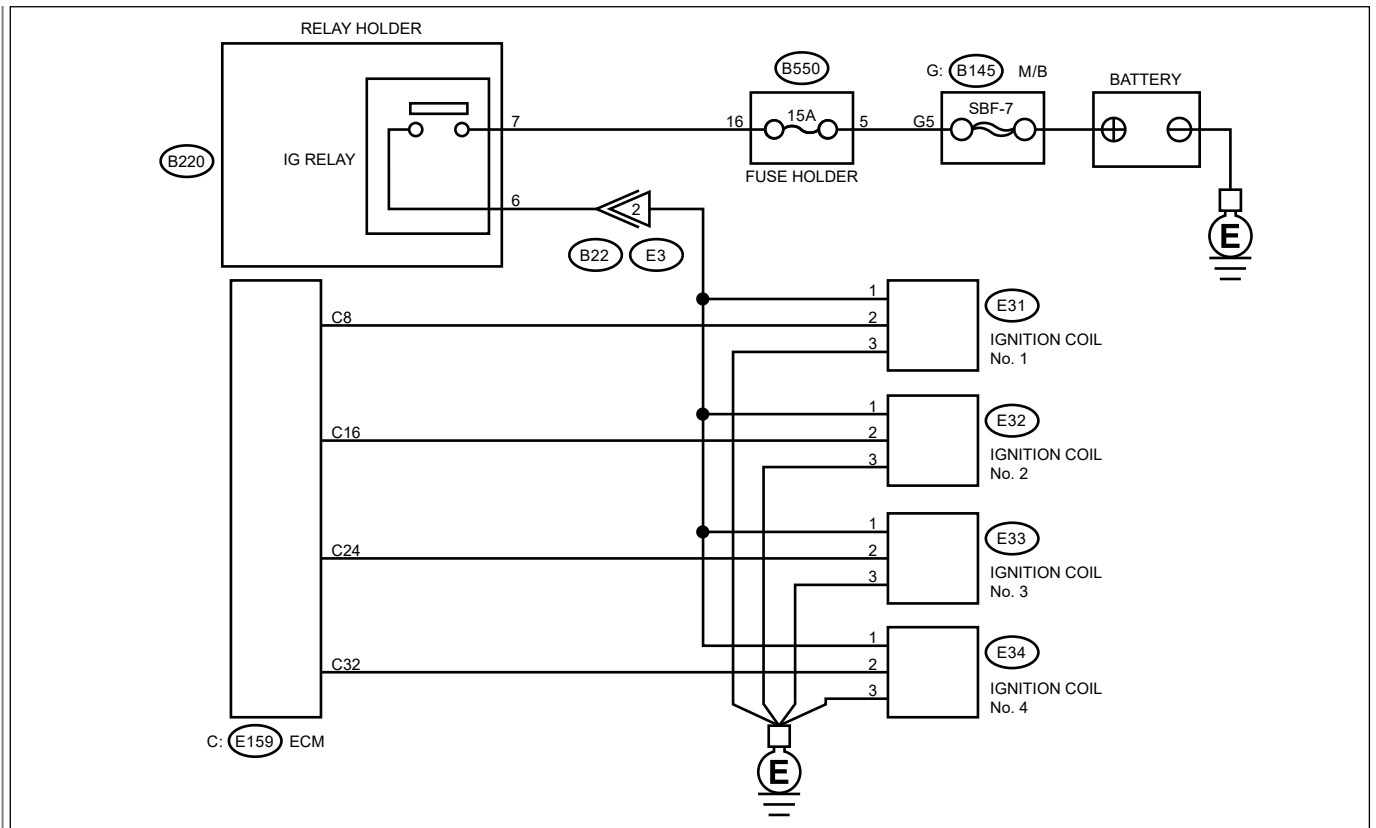
1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48

B: E158 (B)



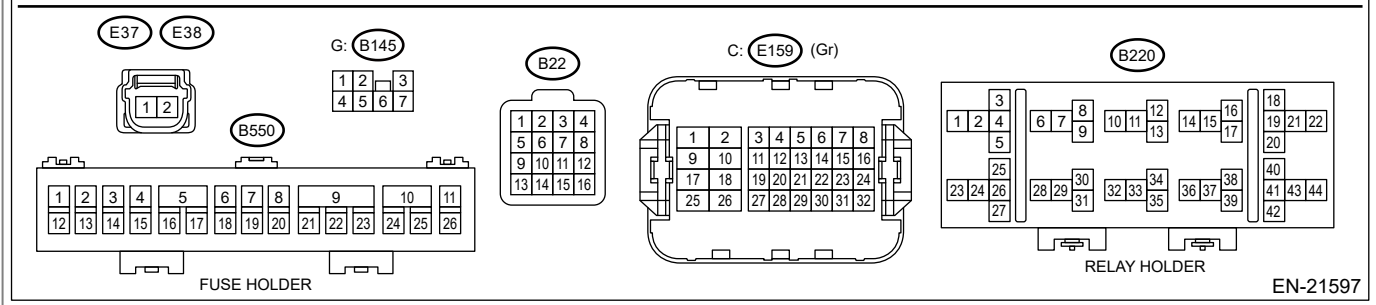
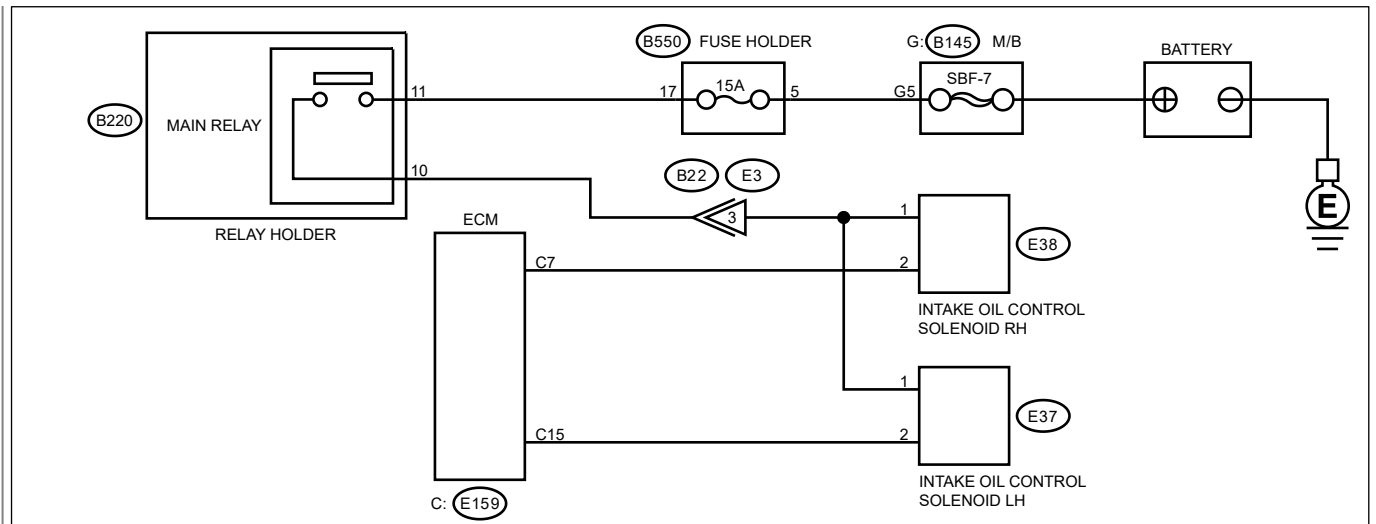
C: E159 (Gr)



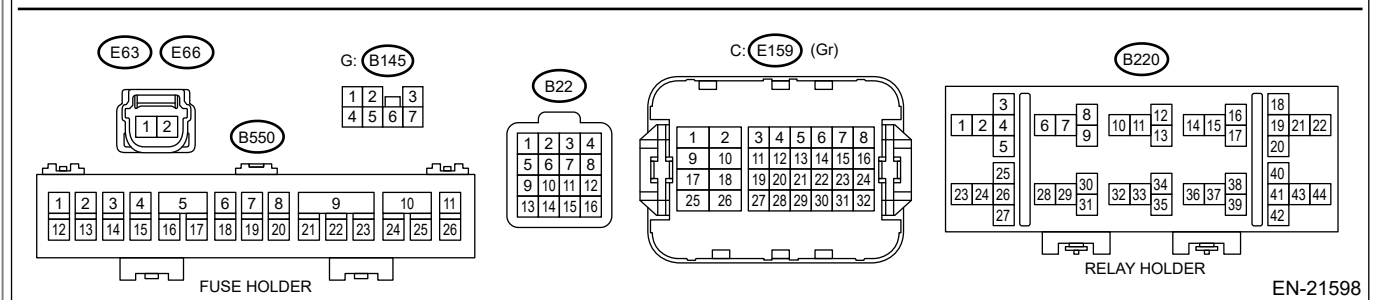
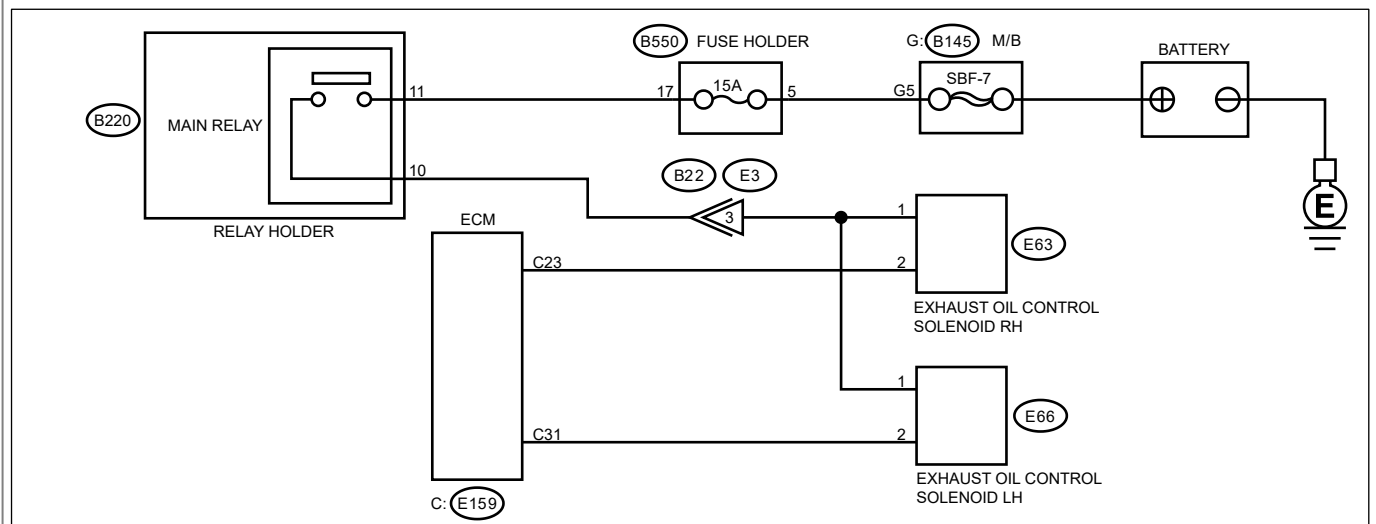


EN-21606



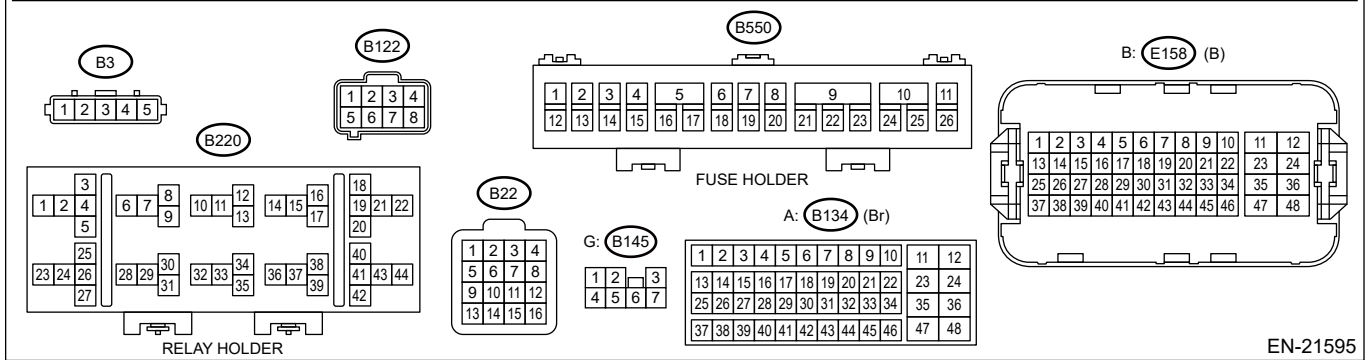
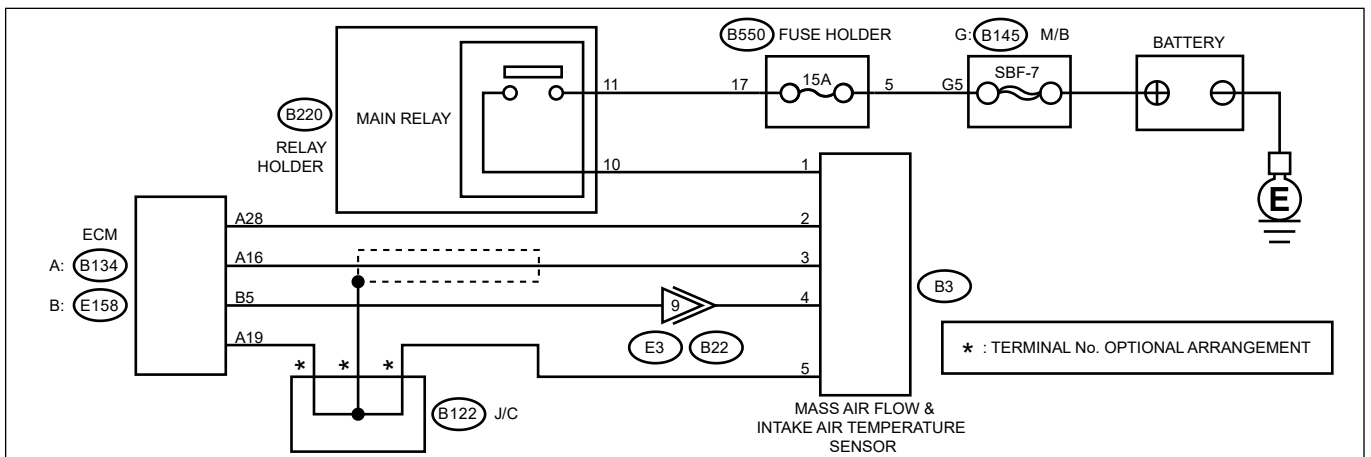


EN-21597

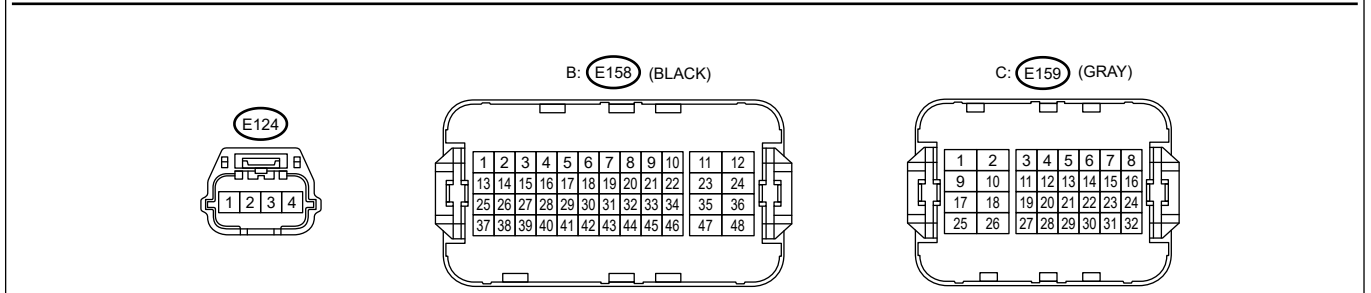
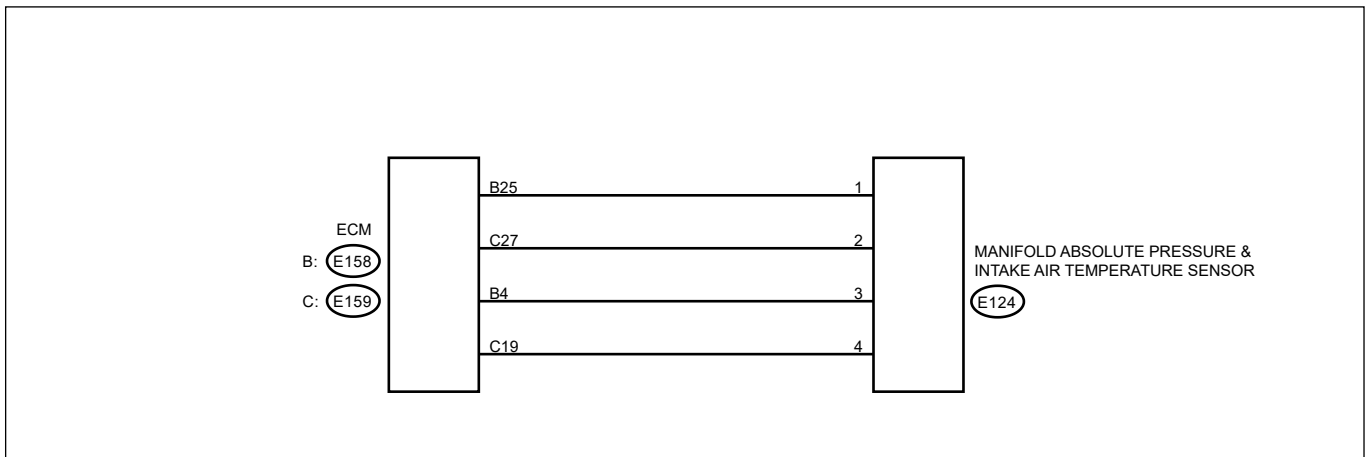


EN-21598

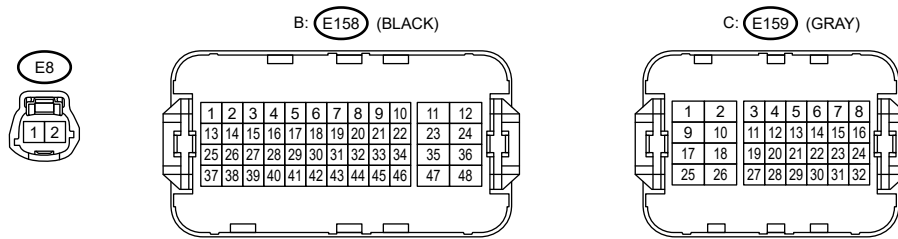
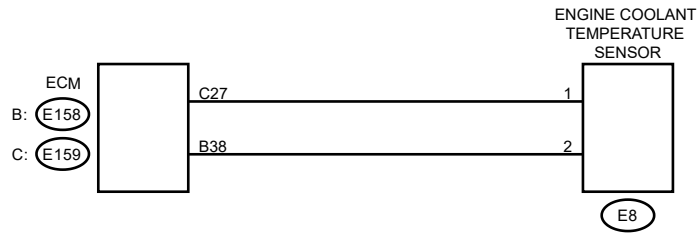




EN-21595

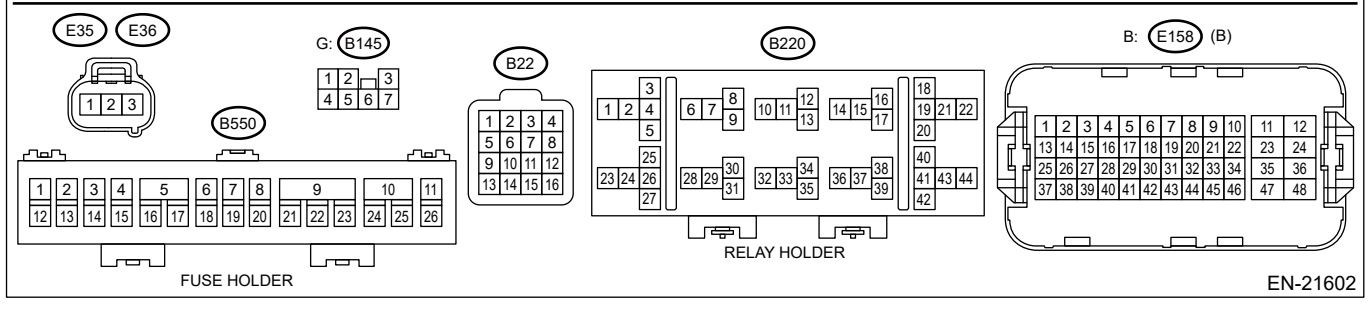
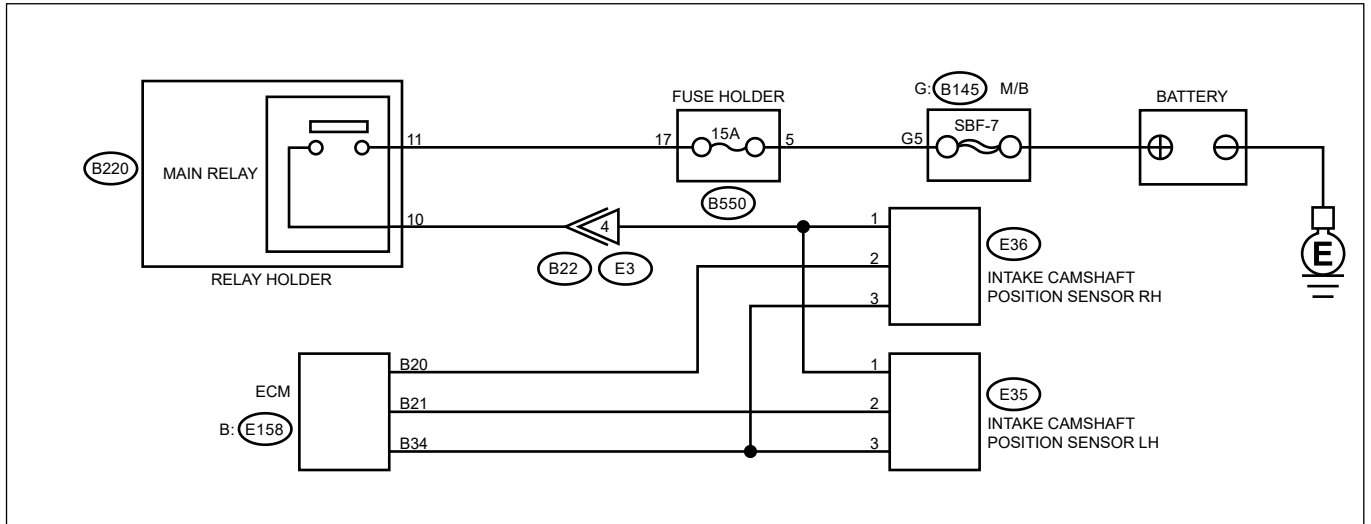


EN-10320

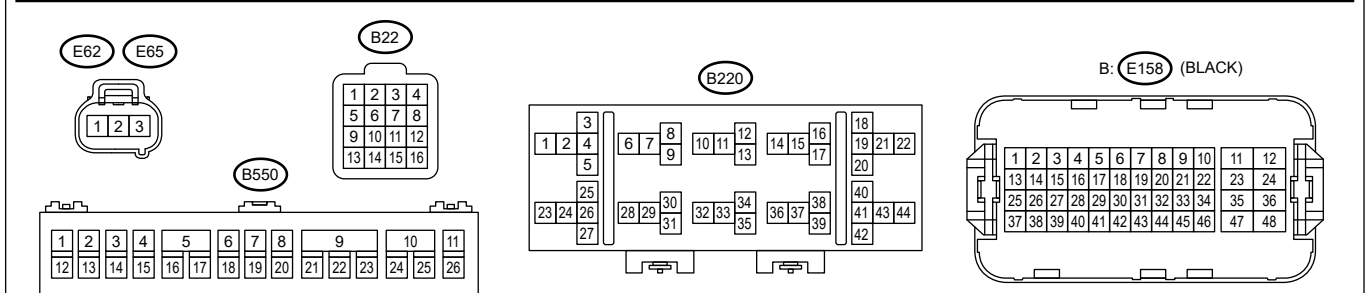
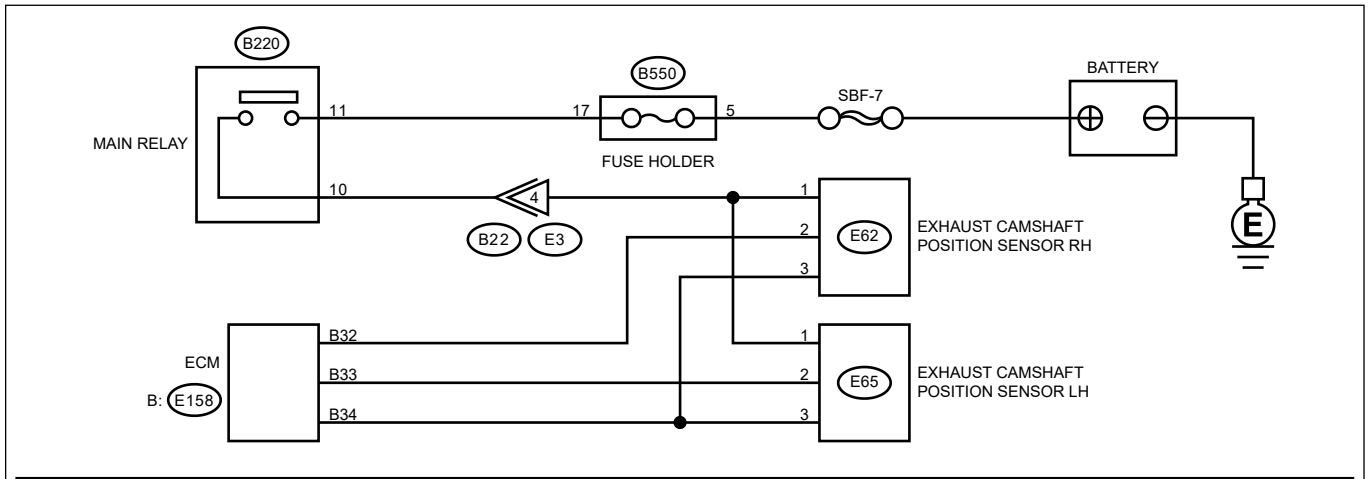


EN-10322





EN-21602



EN-20143

1. CHECK DTC.

Is any other DTC displayed?

Yes

Check DTC using "List of Diagnostic Trouble Code (DTC)". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 2.](#)

2. CHECK IMMOBILIZER.

Check the immobilizer. [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is the immobilizer normal?

Yes

[Go to 3.](#)

No

Repair the immobilizer. [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

3. CHECK FOR MALFUNCTION OCCURRENCE.

Is it possible to reproduce the faulty phenomenon or to identify the faulty condition?

Yes

[Go to 30.](#)

No

[Go to 4.](#)

4. CHECK FREEZE FRAME DATA.



Using the Subaru Select Monitor, read the values in [Engine Speed] and [Control module voltage].

Note:



For detailed operation procedures, refer to "Freeze Frame Data". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [Engine Speed] 0 rpm?

Yes

- When the value of [Control module voltage] is less than 5 V: Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery>INSPECTION.](#)
- When the value of [Control module voltage] is 5 V or more:  [Go to 5.](#)


No

- When the value of [Engine Speed] is less than 250 rpm:  [Go to 12.](#)
- When the value of [Engine Speed] is 250 rpm or more:  [Go to 20.](#)

5. CHECK FREEZE FRAME DATA.


Using the Subaru Select Monitor, read the value in [Control module voltage].

Note:



For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [Control module voltage] less than 9 V?

Yes

It is possible that the engine friction is too large. Check the engine.  [Ref. to MECHANICAL\(H4DOTC\)>Symptoms and causes>INSPECTION.](#)

No

- When the value of [Control module voltage] changes in any one of freeze frame data:  [Go to 6.](#)
- When the value of [Control module voltage] does not change in all freeze frame data: Check the starter motor circuit.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostics for Engine Starting Failure>STARTER MOTOR CIRCUIT.](#)


6. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.

Is the crankshaft position sensor installed correctly?


Yes

 [Go to 7.](#)

No


Install the crankshaft position sensor correctly.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor>INSTALLATION.](#)

7. CHECK CRANKSHAFT POSITION SENSOR.

Check the crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Crankshaft Position Sensor>INSPECTION.](#)

Is the crankshaft position sensor normal?

Yes

 [Go to 8.](#)

No

Replace the crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor.](#)

8. CHECK POWER SUPPLY TO CRANKSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the crankshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between crankshaft position sensor connector and engine ground.

Connector & terminal

(E10) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 9.](#)

No

Repair the power supply circuit.

9. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and crankshaft position sensor connector.


Connector & terminal

(E158) No. 19 — (E10) No. 2:

(E158) No. 31 — (E10) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 10.](#)

No

Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.

10. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.

Measure the resistance between crankshaft position sensor connector and engine ground.

Note:

Connect all connectors after measurement.


Connector & terminal

(E10) No. 2 – Engine ground:

(E10) No. 3 – Engine ground:

Is the resistance 1 MΩ or more?


Yes

 [Go to 11.](#)

No


Repair short circuit to ground in harness between ECM connector and crankshaft position sensor connector.

11. CHECK FOR MALFUNCTION OCCURRENCE.


1. Replace the crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Crankshaft Position Sensor.](#)
2. Check that the fault is removed.

Is the fault removed?

Yes

Clear the memory to complete.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Clear Memory Mode.](#)


No

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

12. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the values in [Coolant Temp.], [Ambient air temperature] and fuel pump duty.

Note:

For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [Coolant Temp.] 120°C (248°F) or more? Or is the value of [Coolant Temp.] lower than that of [Ambient air temperature] by 15°C (27°F) or more?

Yes

Replace the engine coolant temperature sensor. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Coolant Temperature Sensor.](#)

No

- When the value of Fuel Pump Duty is 60% or more: [Go to 13.](#)
- When the value of Fuel Pump Duty is less than 60%: Check the fuel pump system. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0230 FUEL PUMP PRIMARY CIRCUIT.](#)

13. CHECK OF FUEL PUMP.

1. On the [Active Test] item, select [Fuel Pump Relay] and perform [Fuel Pump Control (ON/OFF Dr.)].

Note:

For detailed procedures, refer to "Active Test". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Active Test.](#)

2. Check if operating sound occurs in the fuel pump according to ON/OFF switching operation.

Does the fuel pump emit operating sound?

Yes

[Go to 15.](#)

No

[Go to 14.](#)

14. CHECK OF FUEL PUMP.

Check fuel pump. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pump>INSPECTION.](#)

Is the fuel pump normal?

Yes

Check fuel pump system. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0230 FUEL PUMP PRIMARY CIRCUIT.](#)

No

Replace the fuel pump. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pump.](#)

15. CHECK FUEL TANK.



Check if any foreign matters such as iron powder exist in the fuel tank.

Is there any foreign matter in the fuel tank?

Yes

Remove foreign matter from the fuel tank.

No

[Go to 16.](#)

16. CHECK FUEL PRESSURE.



Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.

Measure the fuel pressure. [Ref. to MECHANICAL\(H4DOTC\)>Fuel Pressure>INSPECTION.](#)

Caution:

Release fuel pressure before removing the fuel pressure gauge.

Is the measured value 340 — 400 kPa (3.5 — 4.1 kgf/cm², 49 — 58 psi)?

Yes

[Go to 17.](#)

No

Check the fuel pump and fuel delivery line. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pump>INSPECTION.](#) [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Delivery and Evaporation Lines>INSPECTION.](#)

17. CHECK FREEZE FRAME DATA.



Using the Subaru Select Monitor, read the values in [Fuel Rail Pressure A] and [Commanded Fuel Rail Pressure A].


Note:

For detailed operation procedures, refer to "Freeze Frame Data". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value in [Fuel Rail Pressure A] synchronized with the one in [Commanded Fuel Rail Pressure A] in all freeze frame data?



Yes

 [Go to 18.](#)

No

Check the high-pressure fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>High Pressure Fuel Pump>INSPECTION.](#)

18. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and fuel injector connector.

Connector & terminal

- #1 (E158) No. 12 — (E5) No. 1:
- #1 (E158) No. 11 — (E5) No. 2:
- #2 (E158) No. 24 — (E16) No. 1:
- #2 (E158) No. 23 — (E16) No. 2:
- #3 (E158) No. 36 — (E6) No. 1:
- #3 (E158) No. 35 — (E6) No. 2:
- #4 (E158) No. 48 — (E17) No. 1:
- #4 (E158) No. 47 — (E17) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 19.](#)

No

Repair the open circuit of the harness between the ECM connector and fuel injector connector.

19. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal


- #1 (E158) No. 12 — Engine ground:
- #1 (E158) No. 11 — Engine ground:
- #2 (E158) No. 24 — Engine ground:
- #2 (E158) No. 23 — Engine ground:
- #3 (E158) No. 36 — Engine ground:
- #3 (E158) No. 35 — Engine ground:

#4 (E158) No. 48 — Engine ground:

#4 (E158) No. 47 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 29.](#)


No

Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

20. CHECK FREEZE FRAME DATA.


Using the Subaru Select Monitor, read the values in [Coolant Temp.], [Ambient air temperature] and [Engine Speed].

Note:



For detailed operation procedures, refer to “Freeze Frame Data”.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [Coolant Temp.] 120°C (248°F) or more? Or is the value of [Coolant Temp.] lower than that of [Ambient air temperature] by 15°C (27°F) or more?


Yes

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Coolant Temperature Sensor.](#)

No


- When the minimum value of [Engine Speed] is less than 300 rpm:  [Go to 21.](#)
- When the minimum value of [Engine Speed] is 300 rpm or more: It is possible that the engine compression pressure is not sufficient. Check the engine.  [Ref. to MECHANICAL\(H4DOTC\)>Symptoms and causes>INSPECTION.](#)

21. CHECK FUEL INJECTOR.


Check fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Injector>INSPECTION.](#)

Is there any deposit in the fuel injectors?

Yes

Replace the fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Injector.](#)

No

 [Go to 22.](#)

22. CHECK FUEL TANK.



Check if any foreign matters such as iron powder exist in the fuel tank.

Is there any foreign matter in the fuel tank?

Yes

Remove foreign matter from the fuel tank.

No

[Go to 23.](#)

23. CHECK FREEZE FRAME DATA.



Using the Subaru Select Monitor, read the value in [Coolant Temp.].

Note:

For detailed operation procedures, refer to "Freeze Frame Data". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value of [Coolant Temp.] 40 – 90°C (104 – 194°F)?

Yes

[Go to 25.](#)

No

[Go to 24.](#)

24. CHECK FUEL PRESSURE.



Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.

Measure the fuel pressure five minutes after the engine is stopped. [Ref. to MECHANICAL\(H4DOTC\)>Fuel Pressure>INSPECTION.](#)

Caution:


Release fuel pressure before removing the fuel pressure gauge.

Note:


If the engine does not start, measure the fuel pressure five minutes after cranking is completed.

Is the measured value 147 kPa (1.5 kgf/cm², 21 psi) or more?

Yes

 [Go to 29.](#)

No

Replace the pressure regulator.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Filter.](#)

25. CHECK FUEL INJECTOR.


1. After the engine is stopped, scavenge inside of the intake manifold by applying compressed air.
2. Measure the HC concentration inside the intake manifold 15 minutes after scavenging is completed.

Note:


Remove the vacuum hose D between intake manifold and purge solenoid valve B and perform measurement.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>General Description>COMPONENT > FUEL INJECTOR 2.](#)

Is the HC concentration less than 4,000 ppm?


Yes

 [Go to 27.](#)

No


 [Go to 26.](#)

26. CHECK FUEL INJECTOR.


Check fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Injector>INSPECTION.](#)

Are fuel injectors OK?


Yes

 [Go to 27.](#)

No


Replace the fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Injector.](#)

27. CHECK THROTTLE BODY.


Check throttle body.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Throttle Body>INSPECTION.](#)

Is there any deposit in the throttle body?

Yes

Replace the throttle body.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Throttle Body.](#)

No


 [Go to 28.](#)

28. CHECK AIR INTAKE SYSTEM.


Check the installing condition of the air intake system.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes

Repair the air intake system.  [Ref. to INTAKE \(INDUCTION\) \(H4DOTC\)>General Description.](#)

No

 [Go to 29.](#)


29. CHECK FOR MALFUNCTION OCCURRENCE.

Is the fault removed?

Yes

Clear the memory to complete.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Clear Memory Mode.](#)





No

 [Go to 30.](#)


30. CHECK FOR MALFUNCTION OCCURRENCE.

Does cranking occur?

Yes

- When the engine speed is abnormal during cranking:  [Go to 37.](#)
- When an initial combustion does not occur:  [Go to 40.](#)
- When the engine stalls immediately after engine start:  [Go to 57.](#)
- When the engine takes time to start:  [Go to 80.](#)

No

 [Go to 31.](#)

31. CHECK FOR MALFUNCTION OCCURRENCE.

Does the sound occur by a protruding starter pinion gear during cranking?

Yes

- When the starter motor does not rotate: [🔗 Go to 32.](#)
- When the starter motor rotates but does not engage: [🔗 Go to 34.](#)

No

[🔗 Go to 35.](#)

32. CHECK BATTERY.

Check the battery. [🔗 Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery>INSPECTION.](#)

Is the battery OK?

Yes

[🔗 Go to 33.](#)

No

Charge or replace the battery. [🔗 Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)

33. CHECK ENGINE MAIN BODY.

Using the ST, rotate the crankshaft.

ST 18252AA000 CRANKSHAFT SOCKET

Does the crankshaft rotate smoothly?

Yes

Check the starter motor. [🔗 Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Starter>INSPECTION.](#)

Note:

It is possible that the engine friction increased temporarily. Check if any foreign matter is mixed in engine oil. If a foreign matter is found, check the engine. [🔗 Ref. to MECHANICAL\(H4DOTC\)>Symptoms and causes>INSPECTION.](#)

No

It is possible that the engine friction is too large. Check the engine. [🔗 Ref. to MECHANICAL\(H4DOTC\)>Symptoms and causes>INSPECTION.](#)

34. CHECK STARTER MOTOR.


Check the starter motor.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Starter>INSPECTION.](#)

Is there any wear or damage in the starter pinion gear?

Yes


Repair the starter motor.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Starter.](#)

No

CVT model: Replace the torque converter assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Torque Converter Assembly.](#)


35. CHECK BATTERY.




Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery>INSPECTION.](#)

Is the battery OK?

Yes

 [Go to 36.](#)

No

Charge or replace the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)


36. CHECK STARTER MOTOR.



Check the starter motor.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Starter>INSPECTION.](#)

Is the starter motor OK?

Yes

Check the starter motor circuit.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostics for Engine Starting Failure>STARTER MOTOR CIRCUIT.](#)

No

Repair the starter motor.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Starter.](#)

37. CHECK CURRENT DATA.




Using the Subaru Select Monitor, read the value of [Engine Speed] during cranking.

Note:


For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Is the value of [Engine Speed] 300 rpm or more?


Yes

It is possible that the compression pressure of the engine is not sufficient. Check the engine.  [Ref. to MECHANICAL\(H4DOTC\)>Symptoms and causes>INSPECTION.](#)

No


 [Go to 38.](#)

38. CHECK BATTERY.


Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery>INSPECTION.](#)

Is the battery OK?

Yes

 [Go to 39.](#)

No

Charge or replace the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)

39. CHECK ENGINE MAIN BODY.

Using the ST, rotate the crankshaft.


ST 18252AA000 CRANKSHAFT SOCKET

Does the crankshaft rotate smoothly?


Yes

Check the starter motor.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Starter>INSPECTION.](#)

Note:

It is possible that the engine friction increased temporarily. Check if any foreign matter is mixed in engine oil. If a foreign matter is found, check the engine.  [Ref. to MECHANICAL\(H4DOTC\)>Symptoms and causes>INSPECTION.](#)

No

It is possible that the engine friction is too large. Check the engine.  [Ref. to MECHANICAL\(H4DOTC\)>Symptoms and causes>INSPECTION.](#)

40. CHECK OPERATION OF EACH FUEL INJECTOR.



Using a sound scope, check each fuel injector for operation sound during cranking.

Does the fuel injector emit operating sound?

Yes

[Go to 41.](#)

No

[Go to 54.](#)

41. CHECK FUEL PRESSURE.



Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.

Measure the fuel pressure. [Ref. to MECHANICAL\(H4DOTC\)>Fuel Pressure>INSPECTION.](#)

Caution:

Release fuel pressure before removing the fuel pressure gauge.

Is the measured value 340 — 400 kPa (3.5 — 4.1 kgf/cm², 49 — 58 psi)?

Yes

[Go to 42.](#)

No

[Go to 52.](#)

42. CHECK IGNITION CONDITION.



Check the ignition condition. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostics for Engine Starting Failure>IGNITION CONTROL SYSTEM.](#)

Is the ignition condition normal?

Yes

[Go to 43.](#)

No

[Go to 46.](#)


43. CHECK FOR MALFUNCTION OCCURRENCE.





Check for the condition of fault occurrence.

Does the fault occur only within approx. 15 to 120 minutes after the engine is stopped?

Yes

 [Go to 45.](#)

No

- When the fault occurs in two or three minutes or a long time after the engine is stopped:  [Go to 44.](#)
- When the fault occurrence pattern is inconsistent:  [Go to 94.](#)


44. CHECK FUEL PRESSURE.

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.

Measure the fuel pressure five minutes after the engine is stopped.  [Ref. to MECHANICAL\(H4DOTC\)>Fuel Pressure>INSPECTION.](#)

Caution:

Release fuel pressure before removing the fuel pressure gauge.

Note:


If the engine does not start, measure the fuel pressure five minutes after cranking is completed.

Is the measured value 147 kPa (1.5 kgf/cm², 21 psi) or more?

Yes

 [Go to 94.](#)


No

Replace the pressure regulator.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Filter.](#)

45. CHECK FUEL INJECTOR.


1. After the engine is stopped, scavenge inside of the intake manifold by applying compressed air.
2. Measure the HC concentration inside the intake manifold 15 minutes after scavenging is completed.

Note:


Remove the vacuum hose D between intake manifold and purge solenoid valve B and perform measurement.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>General Description>COMPONENT > FUEL INJECTOR 2.](#)

Is the HC concentration less than 4,000 ppm?

Yes

 [Go to 94.](#)

No


Replace the fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Injector.](#)

46. CHECK SPARK PLUG.


Check the spark plug.  [Ref. to IGNITION\(H4DOTC\)>Spark Plug>INSPECTION.](#)

Are the spark plugs normal?

Yes

 [Go to 47.](#)

No

Replace all spark plugs on all cylinders.  [Ref. to IGNITION\(H4DOTC\)>Spark Plug.](#)

47. CHECK CURRENT DATA.


Using the Subaru Select Monitor, record the value of [Engine Speed] during cranking.

Note:


For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Does the recorded value of [Engine Speed] contain data of 0 rpm?

Yes

It is possible that temporary fault occurs in the crankshaft position sensor circuit. Check the crankshaft position sensor circuit.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT.](#)

No

 [Go to 48.](#)

48. CHECK IGNITION COIL POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ignition coil.
3. Turn the ignition switch to ON.

4. Measure the voltage between ignition coil connector and engine ground.

Connector & terminal

(E31) No. 1 (+) — Engine ground (–):


(E32) No. 1 (+) — Engine ground (–):

(E33) No. 1 (+) — Engine ground (–):

(E34) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 49.](#)

No

Check the harness and connector.

Note:

In this case, repair the following item:

- **Open or short to ground in power supply circuit**
- **Poor contact of coupling connector**
- **Blown out of fuse**

49. CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR.



1. Disconnect the connector from ECM.

2. Measure the resistance of harness between ECM connector and ignition coil connector.

Connector & terminal

(E159) No. 8 — (E31) No. 3:

(E159) No. 16 — (E32) No. 3:

(E159) No. 24 — (E33) No. 3:

(E159) No. 32 — (E34) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 50.](#)

No

Repair the open circuit in harness between ECM connector and ignition coil connector.

50. CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR.



Measure the resistance of harness between ECM connector and engine ground.

Connector & terminal

(E159) No. 8 — Engine ground:


(E159) No. 16 — Engine ground:

(E159) No. 24 — Engine ground:

(E159) No. 32 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 51.](#)

No

Repair the ground short circuit of harness between ECM connector and ignition coil connector.

51. CHECK HARNESS OF IGNITION COIL GROUND CIRCUIT.

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between ignition coil connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E31) No. 2 — Engine ground:



(E32) No. 2 — Engine ground:

(E33) No. 2 — Engine ground:

(E34) No. 2 — Engine ground:

Is the resistance less than 5 Ω?

Yes

Replace the ignition coil.  [Ref. to IGNITION\(H4DOTC\)>Ignition Coil.](#) If the fault occurs after servicing, continue the diagnosis.  [Go to 99.](#)


No

Repair the open circuit in harness between ignition coil connector and engine grounding terminal.

52. CHECK OF FUEL PUMP.

1. On the item [Active Test], select [Fuel Pump Control (ON/OFF Dr.)] and perform ON/OFF drive.


Note:


For detailed procedures, refer to "Active Test".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Active Test.](#)

2. Check if operating sound occurs in the fuel pump according to ON/OFF switching operation.


Does the fuel pump emit operating sound?

Yes


Check the fuel pump and fuel delivery line.  [Ref. to FUEL INJECTION \(FUEL](#)

[SYSTEMS\)\(H4DOTC\)>Fuel Pump>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Delivery and Evaporation Lines>INSPECTION.](#)

No



 [Go to 53.](#)

53. CHECK OF FUEL PUMP.


Check fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pump>INSPECTION.](#)

Is the fuel pump normal?

Yes

Check fuel pump system.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0230 FUEL PUMP PRIMARY CIRCUIT.](#) If the fault occurs after servicing, continue the diagnosis.  [Go to 94.](#)

No

Replace the fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Pump.](#)

54. CHECK CURRENT DATA.


Using the Subaru Select Monitor, record the value of [Engine Speed] during cranking.

Note:


For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Does the recorded value of [Engine Speed] contain data of 0 rpm?

Yes

It is possible that temporary fault occurs in the crankshaft position sensor circuit. Check the crankshaft position sensor circuit.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT.](#)

No

 [Go to 55.](#)

55. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and fuel injector connector.

Connector & terminal

- #1 (E158) No. 12 — (E5) No. 1:
- #1 (E158) No. 11 — (E5) No. 2:
- #2 (E158) No. 24 — (E16) No. 1:
- #2 (E158) No. 23 — (E16) No. 2:
- #3 (E158) No. 36 — (E6) No. 1:
- #3 (E158) No. 35 — (E6) No. 2:
- #4 (E158) No. 48 — (E17) No. 1:
- #4 (E158) No. 47 — (E17) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 56.](#)

No

Repair the open circuit of the harness between the ECM connector and fuel injector connector.

56. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.



Measure the resistance between the ECM connector and engine ground.

Note:


Connect all connectors after measurement.

Connector & terminal

- #1 (E158) No. 12 — Engine ground:
- #1 (E158) No. 11 — Engine ground:
- #2 (E158) No. 24 — Engine ground:
- #2 (E158) No. 23 — Engine ground:
- #3 (E158) No. 36 — Engine ground:
- #3 (E158) No. 35 — Engine ground:
- #4 (E158) No. 48 — Engine ground:
- #4 (E158) No. 47 — Engine ground:

Is the resistance 1 M Ω or more?

Yes


Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

No

Repair the short circuit to ground in harness between ECM connector and fuel injector connector.


57. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.




Check the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor>INSPECTION.](#)

Is the mass air flow and intake air temperature sensor normal?

Yes

 [Go to 58.](#)

No

 [Go to 78.](#)

58. CHECK AIR INTAKE SYSTEM.




Check the installing condition of the air intake system.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes

Repair the air intake system.  [Ref. to INTAKE \(INDUCTION\) \(H4DOTC\)>General Description.](#)

No

 [Go to 59.](#)

59. CHECK ELECTRONIC THROTTLE CONTROL.



1. Disconnect the connectors from electronic throttle control.
2. Start the engine with the electronic throttle control connector disconnected.

Note:


Connect the connector after check.

Does the engine start?

Yes


 [Go to 60.](#)

No

 [Go to 61.](#)


60. CHECK THROTTLE BODY.




Check throttle body.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Throttle Body>INSPECTION.](#)

Is there any deposit in the throttle body?

Yes

Replace the throttle body.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Throttle Body.](#)


No

 [Go to 61.](#)

61. CHECK FREEZE FRAME DATA.

1. Using the Subaru Select Monitor, read the values in [VVT Adv. Ang. Amount R], [VVT Advance Target Angle Amount R], [VVT Adv. Ang. Amount L], [VVT Advance Target Angle Amount L], [Exh. VVT Retard Ang. R], [Ex VVT Retard Target Angle R], [Exh. VVT Retard Ang. L] and [Ex VVT Retard Target Angle L].


Note:

For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

2. Using the Subaru Select Monitor, compare the respective values between the followings: [VVT Adv. Ang. Amount R] and [VVT Advance Target Angle Amount R], [VVT Adv. Ang. Amount L] and [VVT Advance Target Angle Amount L], [Exh. VVT Retard Ang. R] and [Ex VVT Retard Target Angle R], [Exh. VVT Retard Ang. L] and [Ex VVT Retard Target Angle L].

Does all of the advance angle amount and retard angle amount synchronize with their target values?

Yes

 [Go to 112.](#)

No

Diagnose the part where there is difference of 10 deg or more.

- Intake RH:  [Go to 62.](#)
- Intake LH:  [Go to 66.](#)
- Exhaust RH:  [Go to 70.](#)
- Exhaust LH:  [Go to 74.](#)

62. CHECK POWER SUPPLY TO THE INTAKE OIL CONTROL SOLENOID RH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake oil control solenoid RH.


3. Turn the ignition switch to ON.
4. Measure the voltage between intake oil control solenoid RH connector and engine ground.

Connector & terminal

(E38) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 63.](#)

No

Repair the power supply circuit.

63. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and intake oil control solenoid RH.

Connector & terminal

(E159) No. 7 — (E38) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 64.](#)

No

Repair the open circuit in harness between ECM connector and intake oil control solenoid RH connector.

64. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH CONNECTOR.

Measure the resistance between intake oil control solenoid RH connector and engine ground.

Note:


Connect all connectors after measurement.

Connector & terminal

(E38) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 65.](#)

No

Repair the short circuit to ground in harness between ECM connector and intake oil control solenoid RH connector.

65. CHECK INTAKE OIL CONTROL SOLENOID RH.



1. Check the intake oil control solenoid RH. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Oil Control Solenoid>INSPECTION.](#)

Is the intake oil control solenoid RH normal?

Yes

Replace the intake cam sprocket RH. [Ref. to MECHANICAL\(H4DOTC\)>Cam Sprocket.](#)

No

Replace the intake oil control solenoid RH. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)

66. CHECK POWER SUPPLY TO THE INTAKE OIL CONTROL SOLENOID LH.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake oil control solenoid LH.
3. Turn the ignition switch to ON.
4. Measure the voltage between intake oil control solenoid LH connector and engine ground.

Connector & terminal

(E37) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

[Go to 67.](#)

No

Repair the power supply circuit.

67. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH CONNECTOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and intake oil control solenoid LH.

Connector & terminal

(E159) No. 15 — (E37) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 68.](#)

No

Repair the open circuit in harness between ECM connector and intake oil control solenoid LH connector.

68. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH CONNECTOR.

Measure the resistance between intake oil control solenoid LH connector and engine ground.

Note:


Connect all connectors after measurement.

Connector & terminal

(E37) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 69.](#)

No

Repair the short circuit to ground in harness between ECM connector and intake oil control solenoid LH connector.

69. CHECK INTAKE OIL CONTROL SOLENOID LH.


Check the intake oil control solenoid LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Oil Control Solenoid>INSPECTION.](#)

Is the intake oil control solenoid LH normal?

Yes

Replace the intake cam sprocket LH.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Sprocket.](#)

No

Replace the intake oil control solenoid LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)

70. CHECK POWER SUPPLY TO THE EXHAUST OIL CONTROL SOLENOID RH.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from the exhaust oil control solenoid RH.
3. Turn the ignition switch to ON.
4. Measure the voltage between exhaust oil control solenoid RH connector and engine ground.

Connector & terminal

(E63) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 71.](#)

No

Repair the power supply circuit.

71. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and exhaust oil control solenoid RH.

Connector & terminal

(E159) No. 23 — (E63) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 72.](#)

No

Repair the open circuit in harness between ECM connector and exhaust oil control solenoid RH connector.

72. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH CONNECTOR.

Measure the resistance between exhaust oil control solenoid RH connector and engine ground.

Note:


Connect all connectors after measurement.

Connector & terminal

(E63) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?


Yes

 [Go to 73.](#)

No


Repair the short circuit to ground in harness between ECM connector and exhaust oil control solenoid RH connector.

73. CHECK EXHAUST OIL CONTROL SOLENOID RH.


Check the exhaust oil control solenoid RH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Oil Control Solenoid>INSPECTION.](#)

Is the exhaust oil control solenoid RH normal?

Yes

Replace the exhaust cam sprocket RH.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Sprocket.](#)

No

Replace the exhaust oil control solenoid RH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)

74. CHECK POWER SUPPLY TO THE EXHAUST OIL CONTROL SOLENOID LH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the exhaust oil control solenoid LH.
3. Turn the ignition switch to ON.
4. Measure the voltage between exhaust oil control solenoid LH connector and engine ground.

Connector & terminal

(E66) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 75.](#)

No

Repair the power supply circuit.

75. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.


3. Measure the resistance of harness between ECM connector and exhaust oil control solenoid LH.

Connector & terminal

(E159) No. 31 — (E66) No. 2:

Is the resistance less than 1 Ω?

Yes

 [Go to 76.](#)

No

Repair the open circuit in harness between ECM connector and exhaust oil control solenoid LH connector.

76. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH CONNECTOR.

Measure the resistance between exhaust oil control solenoid LH connector and engine ground.

Note:


Connect all connectors after measurement.

Connector & terminal

(E66) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?


Yes

 [Go to 77.](#)

No


Repair the short circuit to ground in harness between ECM connector and exhaust oil control solenoid LH connector.

77. CHECK EXHAUST OIL CONTROL SOLENOID LH.


Check the exhaust oil control solenoid LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Oil Control Solenoid>INSPECTION.](#)

Is the exhaust oil control solenoid LH normal?

Yes

Replace the exhaust cam sprocket LH.  [Ref. to MECHANICAL\(H4DOTC\)>Cam Sprocket.](#)

No

Replace the exhaust oil control solenoid LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Oil Control Solenoid.](#)

78. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR CONNECTOR AND BETWEEN ECM CONNECTOR AND MANIFOLD ABSOLUTE PRESSURE & INTAKE AIR TEMPERATURE SENSOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the manifold absolute pressure and intake air temperature sensor.
3. Disconnect the connectors from the mass air flow and intake air temperature sensor.
4. Disconnect the connector from ECM.
5. Measure the resistance of harness between ECM connector and air flow & intake air temperature sensor connector, and between ECM connector and manifold absolute pressure & intake air temperature sensor.

Connector & terminal

(B134) No. 16 — (B3) No. 3:


(B134) No. 28 — (B3) No. 2:

(E159) No. 19 — (E124) No. 4:

(E158) No. 25 — (E124) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 79.](#)

No

Repair the open circuit in harness between ECM connector and air flow & intake air temperature sensor connector and between ECM connector and manifold absolute pressure & intake air temperature sensor.

79. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR CONNECTOR AND MANIFOLD ABSOLUTE PRESSURE & INTAKE AIR TEMPERATURE SENSOR.



Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(B134) No. 16 — Engine ground:

(B134) No. 28 — Engine ground:




(E158) No. 25 — Engine ground:

(E159) No. 19 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

Replace air flow & intake air temperature sensor or manifold absolute

pressure & intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor.](#) 
[Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Manifold Absolute Pressure and Intake Air Temperature Sensor.](#) If the fault occurs after servicing, continue the diagnosis.  [Go to 112.](#)

No


Repair the short circuit to ground in harness between ECM connector and air flow & intake air temperature sensor connector and between ECM connector and manifold absolute pressure & intake air temperature sensor.

80. CHECK ENGINE COOLANT TEMPERATURE SENSOR.




Check the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Coolant Temperature Sensor>INSPECTION.](#)

Is the engine coolant temperature sensor normal?

Yes

 [Go to 81.](#)

No

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Coolant Temperature Sensor.](#) If the fault occurs after servicing, replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#) If the fault still occurs after replacing the ECM, continue the diagnosis.  [Go to 123.](#)

81. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the engine coolant temperature sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and engine coolant temperature sensor connector.


Connector & terminal

(E159) No. 27 — (E8) No. 1:

(E158) No. 38 — (E8) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 82.](#)

No

Repair the open circuit of the harness between the ECM connector and engine coolant temperature sensor connector. If the fault occurs after servicing,

replace the ECM. [🔗 Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\)](#). If the fault still occurs after replacing the ECM, continue the diagnosis. [🔗 Go to 123](#).

82. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR.

Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E158) No. 38 — Engine ground:

(E159) No. 27 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

[🔗 Go to 83](#).

No

Repair the short circuit to ground in harness between ECM connector and engine coolant temperature sensor connector. If the fault occurs after servicing, replace the ECM. [🔗 Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\)](#). If the fault still occurs after replacing the ECM, continue the diagnosis. [🔗 Go to 123](#).

83. CHECK CURRENT DATA.

1. Turn the ignition switch to ON. (Engine OFF)
2. Using the Subaru Select Monitor, read the values in [Long term fuel trim B1] and [Barometric Pressure].

Note:

For detailed procedures, refer to "Data Monitor". [🔗 Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR](#).

Is the value of [Long term fuel trim B1] -25 — 25%, and [Barometric Pressure] 80 kPa (600 mmHg, 23.6inHg) or more?

Yes

[🔗 Go to 86](#).

No

[🔗 Go to 84](#).

84. CHECK FOR MALFUNCTION OCCURRENCE.



1. Clear the memory. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)
2. Start the engine.

Does the engine start?

Yes

[Go to 85.](#)

No

[Go to 86.](#)

85. CHECK IDLE SPEED.



Check the idle speed.

Is the idle speed stable?

Yes

Replace the mass air flow and intake air temperature sensor. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Mass Air Flow and Intake Air Temperature Sensor.](#) If the fault occurs after servicing, replace the ECM. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#) If the fault still occurs after replacing the ECM, continue the diagnosis. [Go to 123.](#)

No

Replace the fuel injector. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Injector.](#) If the fault occurs after servicing, replace the ECM. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#) If the fault still occurs after replacing the ECM, continue the diagnosis. [Go to 123.](#)

86. CHECK FUEL PRESSURE.



Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.


Measure the fuel pressure. [Ref. to MECHANICAL\(H4DOTC\)>Fuel Pressure>INSPECTION.](#)

Caution:


Release fuel pressure before removing the fuel pressure gauge.

Is the measured value 340 — 400 kPa (3.5 — 4.1 kgf/cm², 49 — 58 psi)?

Yes

 [Go to 87.](#)


No

 [Go to 93.](#)

87. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the values in [Fuel Rail Pressure A] actual fuel pressure 1 and [Commanded Fuel Rail Pressure A].

Note:

For detailed operation procedures, refer to "Freeze Frame Data".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > FREEZE FRAME DATA.](#)

Is the value in [Fuel Rail Pressure A] actual fuel pressure 1 synchronized with the one in [Commanded Fuel Rail Pressure A] in all freeze frame data?

Yes

 [Go to 88.](#)

No


Check the high-pressure fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>High Pressure Fuel Pump>INSPECTION.](#)

88. CHECK SPARK PLUG.





Check the spark plug.  [Ref. to IGNITION\(H4DOTC\)>Spark Plug>INSPECTION.](#)

Are all spark plug in all cylinders normal?

Yes

 [Go to 89.](#)

No


- When spark plugs in some cylinders are faulty: Replace the faulty spark plugs of the cylinders, then check the ignition system and fuel system in the faulty cylinders.  [Ref. to IGNITION\(H4DOTC\)>Spark Plug.](#)If the fault occurs after servicing, continue the diagnosis.  [Go to 123.](#)
- When all spark plugs in all cylinders are faulty: Replace faulty spark plugs in all cylinders.  [Ref. to IGNITION\(H4DOTC\)>Spark Plug.](#)If the fault occurs after servicing, continue the diagnosis.  [Go to 123.](#)

89. CHECK FOR MALFUNCTION OCCURRENCE.



Check for the condition of fault occurrence.

Does the fault occur only within approx. 15 to 120 minutes after the engine is stopped?

Yes

 [Go to 91.](#)

No

- When the fault occurs in two or three minutes or a long time after the engine is stopped:  [Go to 90.](#)
- When the fault occurrence pattern is inconsistent:  [Go to 123.](#)


90. CHECK FUEL PRESSURE.

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.

Measure the fuel pressure five minutes after the engine is stopped.  [Ref. to MECHANICAL\(H4DOTC\)>Fuel Pressure>INSPECTION.](#)

Caution:


Release fuel pressure before removing the fuel pressure gauge.

Note:


If the engine does not start, measure the fuel pressure five minutes after cranking is completed.

Is the measured value 147 kPa (1.5 kgf/cm², 21 psi) or more?


Yes

 [Go to 123.](#)

No


Replace the pressure regulator.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Filter.](#)

91. CHECK PURGE CONTROL SOLENOID VALVE.


Check purge control solenoid valve 1 and purge control solenoid valve 2.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Purge Control Solenoid Valve>INSPECTION.](#)

Are the purge control solenoid valve 1 and the purge control solenoid valve 2 normal?

Yes

 [Go to 92.](#)

No

Replace the faulty purge control solenoid valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Purge Control Solenoid Valve.](#)

92. CHECK FUEL INJECTOR.



1. After the engine is stopped, scavenge inside of the intake manifold by applying compressed air.
2. Measure the HC concentration inside the intake manifold 15 minutes after scavenging is completed.

Is the HC concentration less than 4,000 ppm?

Yes

[Go to 123.](#)

No

Replace the fuel injector. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Injector.](#)

93. CHECK OF FUEL PUMP.



Check fuel pump. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pump>INSPECTION.](#)

Is the fuel pump normal?

Yes

Check fuel pump system. [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0230 FUEL PUMP PRIMARY CIRCUIT.](#) If the fault occurs after servicing, continue the diagnosis. [Go to 123.](#)

No

Replace the fuel pump. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Pump.](#)

94. CHECK FUEL INJECTOR.



Check fuel injector. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Injector>INSPECTION.](#)

Are fuel injectors OK?

Yes

[Go to 95.](#)

No

Replace the fuel injector. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Injector.](#)

95. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and fuel injector connector.

Connector & terminal

- #1 (E158) No. 12 — (E5) No. 1:
- #1 (E158) No. 11 — (E5) No. 2:
- #2 (E158) No. 24 — (E16) No. 1:
- #2 (E158) No. 23 — (E16) No. 2:
- #3 (E158) No. 36 — (E6) No. 1:
- #3 (E158) No. 35 — (E6) No. 2:
- #4 (E158) No. 48 — (E17) No. 1:
- #4 (E158) No. 47 — (E17) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 96.](#)

No

Repair the open circuit of the harness between the ECM connector and fuel injector connector.

96. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.



Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

- #1 (E158) No. 12 — Engine ground:
- #1 (E158) No. 11 — Engine ground:
- #2 (E158) No. 24 — Engine ground:
- #2 (E158) No. 23 — Engine ground:
- #3 (E158) No. 36 — Engine ground:
- #3 (E158) No. 35 — Engine ground:
- #4 (E158) No. 48 — Engine ground:
- #4 (E158) No. 47 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 97.](#)

No

Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

97. CHECK FOR MALFUNCTION OCCURRENCE.



1. Replace the crankshaft position sensor. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Crankshaft Position Sensor.](#)
2. Check that the fault is removed.

Is the fault removed?

Yes

Clear the memory to complete. [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Clear Memory Mode.](#)

No

[Go to 98.](#)

98. CHECK FOR MALFUNCTION OCCURRENCE.



1. Replace the camshaft position sensor. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Camshaft Position Sensor.](#)
2. Check that the fault is removed.

Is the fault removed?

Yes

Clear the memory to complete. [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Clear Memory Mode.](#)

No

Replace the ECM. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

99. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.



Is the crankshaft position sensor installed correctly?

Yes

[Go to 100.](#)

No

Install the crankshaft position sensor correctly. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor>INSTALLATION.](#)

100. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR.



Is the camshaft position sensor installed correctly?

Yes

[Go to 101.](#)

No

Install the camshaft position sensor correctly. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Camshaft Position Sensor>INSTALLATION.](#)

101. CHECK POWER SUPPLY TO CRANKSHAFT POSITION SENSOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the crankshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between crankshaft position sensor connector and engine ground.

Connector & terminal

(E10) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

[Go to 102.](#)

No

Repair the power supply circuit.

102. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and crankshaft position sensor connector.

Connector & terminal

(E158) No. 19 — (E10) No. 2:

(E158) No. 31 — (E10) No. 3:

Is the resistance less than 1 Ω ?

Yes

[Go to 103.](#)

No

Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.

103. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.



Measure the resistance between crankshaft position sensor connector and engine ground.

Note:

Connect all connectors after measurement.


Connector & terminal

(E10) No. 2 – Engine ground:

(E10) No. 3 – Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 104.](#)

No

Repair short circuit to ground in harness between ECM connector and crankshaft position sensor connector.

104. CHECK POWER SUPPLY OF INTAKE CAMSHAFT POSITION SENSOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake camshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between intake camshaft position sensor connector and engine ground.


Connector & terminal

(E35) No. 1 (+) – Engine ground (-):

(E36) No. 1 (+) – Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 105.](#)

No

repair the harness and connector.

Note:

- **Open circuit or short circuit to ground in harness between main relay connector and intake camshaft position sensor connector**
- **Poor contact of coupling connector**

105. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and intake camshaft position sensor connector.

Connector & terminal

(E158) No. 21 — (E35) No. 2:


(E158) No. 34 — (E35) No. 3:

(E158) No. 20 — (E36) No. 2:

(E158) No. 34 — (E36) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 106.](#)

No

Repair the open circuit in the harness between ECM connector and intake camshaft position sensor connector.

106. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR CONNECTOR.

Measure the resistance between intake camshaft position sensor connector and engine ground.

Note:

Connect all connectors after measurement.


Connector & terminal

(E35) No. 2 — Engine ground:

(E36) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 107.](#)

No

Repair short circuit to ground in the harness between ECM connector and intake camshaft position sensor connector.

107. CHECK POWER SUPPLY OF EXHAUST CAMSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the exhaust camshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between exhaust camshaft position sensor connector and engine ground.


Connector & terminal

(E62) No. 1 (+) — Engine ground (–):

(E65) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 108.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between main relay and exhaust camshaft position sensor connector**
- **Poor contact of coupling connector**

108. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and exhaust camshaft position sensor connector.

Connector & terminal

(E158) No. 32 — (E62) No. 2:


(E158) No. 34 — (E62) No. 3:

(E158) No. 33 — (E65) No. 2:

(E158) No. 34 — (E65) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 109.](#)

No

Repair the open circuit in the harness between ECM connector and exhaust camshaft position sensor connector.

109. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR CONNECTOR.

Measure the resistance between exhaust camshaft position sensor connector and engine ground.

Note:

Connect all connectors after measurement.


Connector & terminal

(E62) No. 2 – Engine ground:

(E65) No. 2 – Engine ground:

Is the resistance 1 MΩ or more?


Yes

 [Go to 110.](#)

No

Repair short circuit to ground in the harness between ECM connector and exhaust camshaft position sensor connector.

110. CHECK FOR MALFUNCTION OCCURRENCE.


1. Replace the crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Crankshaft Position Sensor.](#)
2. Check that the fault is removed.

Is the fault removed?


Yes

Clear the memory to complete.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Clear Memory Mode.](#)

No


 [Go to 111.](#)

111. CHECK FOR MALFUNCTION OCCURRENCE.


1. Replace the camshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Camshaft Position Sensor.](#)
2. Check that the fault is removed.

Is the fault removed?


Yes

Clear the memory to complete.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Clear Memory Mode.](#)

No


Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

112. CHECK ENGINE COOLANT TEMPERATURE SENSOR.


Check the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Coolant Temperature Sensor>INSPECTION.](#)

Is the engine coolant temperature sensor normal?

Yes

 [Go to 113.](#)

No

Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Coolant Temperature Sensor.](#)

113. CHECK FUEL PRESSURE.

1. Read the value of Fuel Rail Pressure A during cranking using Subaru Select Monitor.

Note:


For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.


2. Measure the fuel pressure five minutes after the engine is stopped.  [Ref. to MECHANICAL\(H4DOTC\)>Fuel Pressure>INSPECTION.](#)

Caution:


Release fuel pressure before removing the fuel pressure gauge.

Is the value of actual fuel pressure 1 during cranking 304 — 353 kPa (3.1 — 3.6 kgf/cm², 44 — 51 psi), and is the fuel pressure five minutes after engine stop 147 kPa (1.5 kgf/cm², 21 psi) or more?

Yes

 [Go to 114.](#)

No

 [Go to 122.](#)

114. CHECK CURRENT DATA.


1. Turn the ignition switch to ON. (Engine OFF)
2. Using the Subaru Select Monitor, read the value in [Long term fuel trim B1].

Note:


For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Does the value of [Long term fuel trim B1] fall within a range of -15 — 15%?

Yes

 [Go to 115.](#)

No

Replace the fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Injector.](#)

115. CHECK FOR MALFUNCTION OCCURRENCE.


Start the engine and check the idling speed.

Is the idling speed stable all time?

Yes

It is possible that the fault comes from fuel. Replace fuel.


No

 [Go to 116.](#)


116. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.

Is the crankshaft position sensor installed correctly?

Yes

 [Go to 117.](#)

No

Install the crankshaft position sensor correctly.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor>INSTALLATION.](#)

117. CHECK POWER SUPPLY TO CRANKSHAFT POSITION SENSOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from the crankshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between crankshaft position sensor connector and engine ground.

Connector & terminal

(E10) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 118.](#)

No

Repair the power supply circuit.

118. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and crankshaft position sensor connector.


Connector & terminal

(E158) No. 19 — (E10) No. 2:

(E158) No. 31 — (E10) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 119.](#)

No

Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.

119. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.

Measure the resistance between crankshaft position sensor connector and engine ground.

Note:

Connect all connectors after measurement.


Connector & terminal

(E10) No. 2 — Engine ground:

(E10) No. 3 — Engine ground:

Is the resistance 1 M Ω or more?

Yes


 [Go to 120.](#)

No

Repair short circuit to ground in harness between ECM connector and crankshaft position sensor connector.


120. CHECK COMPRESSION PRESSURE.




Check the compression pressure.  [Ref. to MECHANICAL\(H4DOTC\)>Compression>INSPECTION.](#)

Is the compression pressure normal?

Yes


 [Go to 121.](#)

No

Check the engine.  [Ref. to MECHANICAL\(H4DOTC\)>Symptoms and causes>INSPECTION.](#)

121. CHECK FOR MALFUNCTION OCCURRENCE.





1. Replace the crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor.](#)
2. Check that the fault is removed.

Is the fault removed?

Yes


Clear the memory to complete.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)

No

Check the valve timing.  [Ref. to MECHANICAL\(H4DOTC\)>Timing Chain Assembly.](#) When the valve timing is normal, replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)


122. CHECK OF FUEL PUMP.




Check fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pump>INSPECTION.](#)

Is the fuel pump normal?

Yes

Check fuel pump system.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0230 FUEL PUMP PRIMARY CIRCUIT.](#)

No


Replace the fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pump.](#)

123. CHECK FUEL PRESSURE.



1. Read the value of Fuel Rail Pressure A during cranking using Subaru Select Monitor.

Note:


For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.


2. Measure the fuel pressure five minutes after the engine is stopped.  [Ref. to MECHANICAL\(H4DOTC\)>Fuel Pressure>INSPECTION.](#)

Caution:


Release fuel pressure before removing the fuel pressure gauge.

Is the value of actual fuel pressure 1 during cranking 304 — 353 kPa (3.1 — 3.6 kgf/cm², 44 — 51 psi), and is the fuel pressure five minutes after engine stop 147 kPa (1.5 kgf/cm², 21 psi) or more?

Yes

 [Go to 124.](#)

No


 [Go to 131.](#)

124. CHECK CURRENT DATA.




1. Turn the ignition switch to ON. (Engine OFF)
2. Using the Subaru Select Monitor, read the value in [Long term fuel trim B1].

Note:


For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Does the value of [Long term fuel trim B1] fall within a range of -15 — 15%?

Yes

 [Go to 125.](#)

No

Replace the fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Injector.](#)

125. CHECK FOR MALFUNCTION OCCURRENCE.




Start the engine and check the idling speed.

Is the idling speed stable all time?

Yes

It is possible that the fault comes from fuel. Replace fuel.

No


 [Go to 126.](#)

126. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.




Is the crankshaft position sensor installed correctly?

Yes

 [Go to 127.](#)

No

Install the crankshaft position sensor correctly.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor>INSTALLATION.](#)

127. CHECK POWER SUPPLY TO CRANKSHAFT POSITION SENSOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from the crankshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between crankshaft position sensor connector and engine ground.

Connector & terminal

(E10) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 128.](#)

No

Repair the power supply circuit.

128. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.

3. Measure the resistance of harness between ECM connector and crankshaft position sensor connector.


Connector & terminal

(E158) No. 19 — (E10) No. 2:

(E158) No. 31 — (E10) No. 3:

Is the resistance less than 1 Ω?

Yes

 [Go to 129.](#)

No

Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.

129. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.



Measure the resistance between crankshaft position sensor connector and engine ground.

Note:

Connect all connectors after measurement.


Connector & terminal

(E10) No. 2 — Engine ground:

(E10) No. 3 — Engine ground:

Is the resistance 1 MΩ or more?

Yes


 [Go to 130.](#)

No

Repair short circuit to ground in harness between ECM connector and crankshaft position sensor connector.

130. CHECK FOR MALFUNCTION OCCURRENCE.



1. Replace the crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Crankshaft Position Sensor.](#)


2. Check that the fault is removed.

Is the fault removed?

Yes


Clear the memory to complete.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Clear Memory Mode.](#)

No

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)


131. CHECK FUEL PUMP.




Check fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pump>INSPECTION.](#)

Is the fuel pump normal?

Yes


 [Go to 132.](#)

No

Replace the fuel pump.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pump.](#)


132. CHECK FUEL PUMP SYSTEM.




Check fuel pump system.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0230 FUEL PUMP PRIMARY CIRCUIT.](#)

Is the fuel pump system normal?

Yes


 [Go to 133.](#)

No

Repair the fuel pump system.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0230 FUEL PUMP PRIMARY CIRCUIT.](#)


133. CHECK PURGE CONTROL SOLENOID VALVE.




Check purge control solenoid valve 1 and purge control solenoid valve 2.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Purge Control Solenoid Valve>INSPECTION.](#)

Are the purge control solenoid valve 1 and the purge control solenoid valve 2 normal?

Yes

 [Go to 134.](#)

No

Replace the faulty purge control solenoid valve.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Purge Control Solenoid Valve.](#)

134. CHECK FUEL INJECTOR.



1. After the engine is stopped, scavenge inside of the intake manifold by applying compressed air.
2. Measure the HC concentration inside the intake manifold 15 minutes after scavenging is completed.

Is the HC concentration less than 4,000 ppm?

Yes

[Go to 135.](#)

No

Replace the fuel injector. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Injector.](#)

135. CHECK INTAKE VALVE.



Check the intake valve. [Ref. to MECHANICAL\(H4DOTC\)>Cylinder Head>INSPECTION.](#)

Is there any deposit in the intake valve?

Yes

Clean the intake valve. [Ref. to MECHANICAL\(H4DOTC\)>Cylinder Head.](#)

No

[Go to 136.](#)

136. CHECK ENGINE COOLANT TEMPERATURE SENSOR.



Check the engine coolant temperature sensor. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Coolant Temperature Sensor>INSPECTION.](#)

Is the engine coolant temperature sensor normal?

Yes

[Go to 137.](#)

No


Replace the engine coolant temperature sensor. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Coolant Temperature Sensor.](#)

137. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.




Is the crankshaft position sensor installed correctly?

Yes

 [Go to 138.](#)

No


Install the crankshaft position sensor correctly.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Crankshaft Position Sensor>INSTALLATION.](#)

138. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR.




Is the camshaft position sensor installed correctly?

Yes

 [Go to 139.](#)

No

Install the camshaft position sensor correctly.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Camshaft Position Sensor>INSTALLATION.](#)

139. CHECK POWER SUPPLY TO CRANKSHAFT POSITION SENSOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from the crankshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between crankshaft position sensor connector and engine ground.

Connector & terminal

(E10) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 140.](#)

No

Repair the power supply circuit.

140. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and crankshaft position

sensor connector.


Connector & terminal

(E158) No. 19 — (E10) No. 2:

(E158) No. 31 — (E10) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 141.](#)

No

Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.

141. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR.



Measure the resistance between crankshaft position sensor connector and engine ground.

Note:

Connect all connectors after measurement.


Connector & terminal

(E10) No. 2 — Engine ground:

(E10) No. 3 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 142.](#)

No

Repair short circuit to ground in harness between ECM connector and crankshaft position sensor connector.

142. CHECK POWER SUPPLY OF INTAKE CAMSHAFT POSITION SENSOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake camshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between intake camshaft position sensor connector and engine ground.

Connector & terminal


(E35) No. 1 (+) — Engine ground (-):

(E36) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?



Yes

 [Go to 143.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit or short circuit to ground in harness between main relay connector and intake camshaft position sensor connector**
- **Poor contact of coupling connector**

143. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and intake camshaft position sensor connector.

Connector & terminal

(E158) No. 21 — (E35) No. 2:


(E158) No. 34 — (E35) No. 3:

(E158) No. 20 — (E36) No. 2:

(E158) No. 34 — (E36) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 144.](#)

No

Repair the open circuit in the harness between ECM connector and intake camshaft position sensor connector.

144. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR CONNECTOR.

Measure the resistance between intake camshaft position sensor connector and engine ground.

Note:

Connect all connectors after measurement.


Connector & terminal

(E35) No. 2 — Engine ground:

(E36) No. 2 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 145.](#)

No

Repair short circuit to ground in the harness between ECM connector and intake camshaft position sensor connector.

145. CHECK POWER SUPPLY OF EXHAUST CAMSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the exhaust camshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between exhaust camshaft position sensor connector and engine ground.


Connector & terminal

(E62) No. 1 (+) — Engine ground (–):

(E65) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 146.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between main relay and exhaust camshaft position sensor connector**
- **Poor contact of coupling connector**

146. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and exhaust camshaft position sensor connector.

Connector & terminal

(E158) No. 32 — (E62) No. 2:


(E158) No. 34 — (E62) No. 3:

(E158) No. 33 — (E65) No. 2:

(E158) No. 34 — (E65) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 147.](#)

No

Repair the open circuit in the harness between ECM connector and exhaust camshaft position sensor connector.

147. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR CONNECTOR.

Measure the resistance between exhaust camshaft position sensor connector and engine ground.

Note:

Connect all connectors after measurement.


Connector & terminal

(E62) No. 2 – Engine ground:

(E65) No. 2 – Engine ground:

Is the resistance 1 MΩ or more?


Yes

 [Go to 148.](#)

No


Repair short circuit to ground in the harness between ECM connector and exhaust camshaft position sensor connector.

148. CHECK COMPRESSION PRESSURE.


Check the compression pressure.  [Ref. to MECHANICAL\(H4DOTC\)>Compression>INSPECTION.](#)

Is the compression pressure normal?


Yes

 [Go to 149.](#)

No

Check the engine.  [Ref. to MECHANICAL\(H4DOTC\)>Symptoms and causes>INSPECTION.](#)

149. CHECK FOR MALFUNCTION OCCURRENCE.


1. Replace the crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Crankshaft Position Sensor.](#)
2. Check that the fault is removed.

Is the fault removed?


Yes

Clear the memory to complete.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Clear Memory Mode.](#)

No

 [Go to 150.](#)

150. CHECK FOR MALFUNCTION OCCURRENCE.



1. Replace the camshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Camshaft Position Sensor.](#)
2. Check that the fault is removed.

Is the fault removed?

Yes

Clear the memory to complete.

No

Check the valve timing.  [Ref. to MECHANICAL\(H4DOTC\)>Timing Chain Assembly.](#) When the valve timing is normal, replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)

1. OUTLINE OF DIAGNOSIS

Judge as NG when the status enters into any one of the followings.

- Although starter signal input is present in ECM, the engine does not start (diagnosis 1)
- Although starter signal input is present in ECM, starting takes more time than it should (diagnosis 1)
- The engine stops immediately after starting except by operating the ignition switch (diagnosis 2)

2. EXECUTION CONDITION

Diagnosis 1

Secondary Parameters	Execution condition
Starter signal	ON

Diagnosis 2

Secondary Parameters	Execution condition
Elapsed time after starting the engine	≤ 2 s

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously after the enable conditions have been established.

4. DIAGNOSTIC METHOD

Diagnosis 1

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Engine speed	< 500 rpm

Time Needed for Diagnosis: 2 – 26 seconds

Diagnosis 2

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Engine speed	< 300 rpm

Time needed for diagnosis: Less than 1 second

Malfunction Indicator Light Illumination: Does not illuminate.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2004 TGV CONTROL STUCK OPEN BANK 1

DTC detecting condition:

Immediately at fault recognition


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>List of Diagnostic Trouble Code (DTC)..

No

 Go to 2.

2. CHECK TUMBLE GENERATOR VALVE RH.


1. Remove the tumble generator valve assembly RH.
2. Check the tumble generator valve.

Is there any dirt or clogging with foreign objects in the tumble generator valve?

Yes

Clean the tumble generator valve.

No

Replace the tumble generator valve RH.  Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Tumble Generator Valve Assembly.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of tumble generator valve motor function.

Judge open fixing malfunction when the opening degree is large even after finishing the tumble generator valve closing driving.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
----------------------	---------------------

Battery voltage	$\geq 10.9 \text{ V}$
Tumble generator valve "close" signal output time	$\geq 3.2 \text{ s}$

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Tumble generator valve opening angle	$\geq 57 \text{ deg}$

Time needed for diagnosis: 3000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2005 TGV CONTROL STUCK OPEN BANK 2

DTC detecting condition:

Immediately at fault recognition


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..


1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>List of Diagnostic Trouble Code (DTC)..

No

 Go to 2.

2. CHECK TUMBLE GENERATOR VALVE LH.


1. Remove the tumble generator valve assembly LH.
2. Check the tumble generator valve.

Is there any dirt or clogging with foreign objects in the tumble generator valve?

Yes

Clean the tumble generator valve.

No

Replace the tumble generator valve LH.  Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Tumble Generator Valve Assembly.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of tumble generator valve motor function.

Judge open fixing malfunction when the opening degree is large even after finishing the tumble generator valve closing driving.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
----------------------	---------------------

Battery voltage	$\geq 10.9 \text{ V}$
Tumble generator valve "close" signal output time	$\geq 3.2 \text{ s}$

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Tumble generator valve opening angle	$\geq 57 \text{ deg}$

Time needed for diagnosis: 3000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2006 TGV CONTROL STUCK CLOSED BANK 1

DTC detecting condition:

Immediately at fault recognition


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>List of Diagnostic Trouble Code (DTC).

No

 Go to 2.

2. CHECK TUMBLE GENERATOR VALVE RH.


1. Remove the tumble generator valve assembly RH.
2. Check the tumble generator valve.

Is there any dirt or clogging with foreign objects in the tumble generator valve?

Yes

Clean the tumble generator valve.

No

Replace the tumble generator valve RH.  Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Tumble Generator Valve Assembly.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of tumble generator valve motor function.

Judge close fixing malfunction when the opening degree is small even after finishing the tumble generator valve open driving.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
----------------------	---------------------

Battery voltage	$\geq 10.9 \text{ V}$
Tumble generator valve "open" signal output time	$\geq 4.6 \text{ s}$

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Tumble generator valve opening angle	$< 57 \text{ deg}$

Time needed for diagnosis: 3000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2007 TGV CONTROL STUCK CLOSED BANK 2

DTC detecting condition:

Immediately at fault recognition


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>List of Diagnostic Trouble Code (DTC).

No

 Go to 2.

2. CHECK TUMBLE GENERATOR VALVE LH.


1. Remove the tumble generator valve assembly LH.
2. Check the tumble generator valve.

Is there any dirt or clogging with foreign objects in the tumble generator valve?

Yes

Clean the tumble generator valve.

No

Replace the tumble generator valve LH.  Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Tumble Generator Valve Assembly.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of tumble generator valve motor function.

Judge close fixing malfunction when the opening degree is small even after finishing the tumble generator valve open driving.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
----------------------	---------------------

Battery voltage	$\geq 10.9 \text{ V}$
Tumble generator valve "open" signal output time	$\geq 4.6 \text{ s}$

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Tumble generator valve opening angle	$< 57 \text{ deg}$

Time needed for diagnosis: 3000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2009 TGV CONTROL CIRCUIT LOW BANK 1

DTC detecting condition:

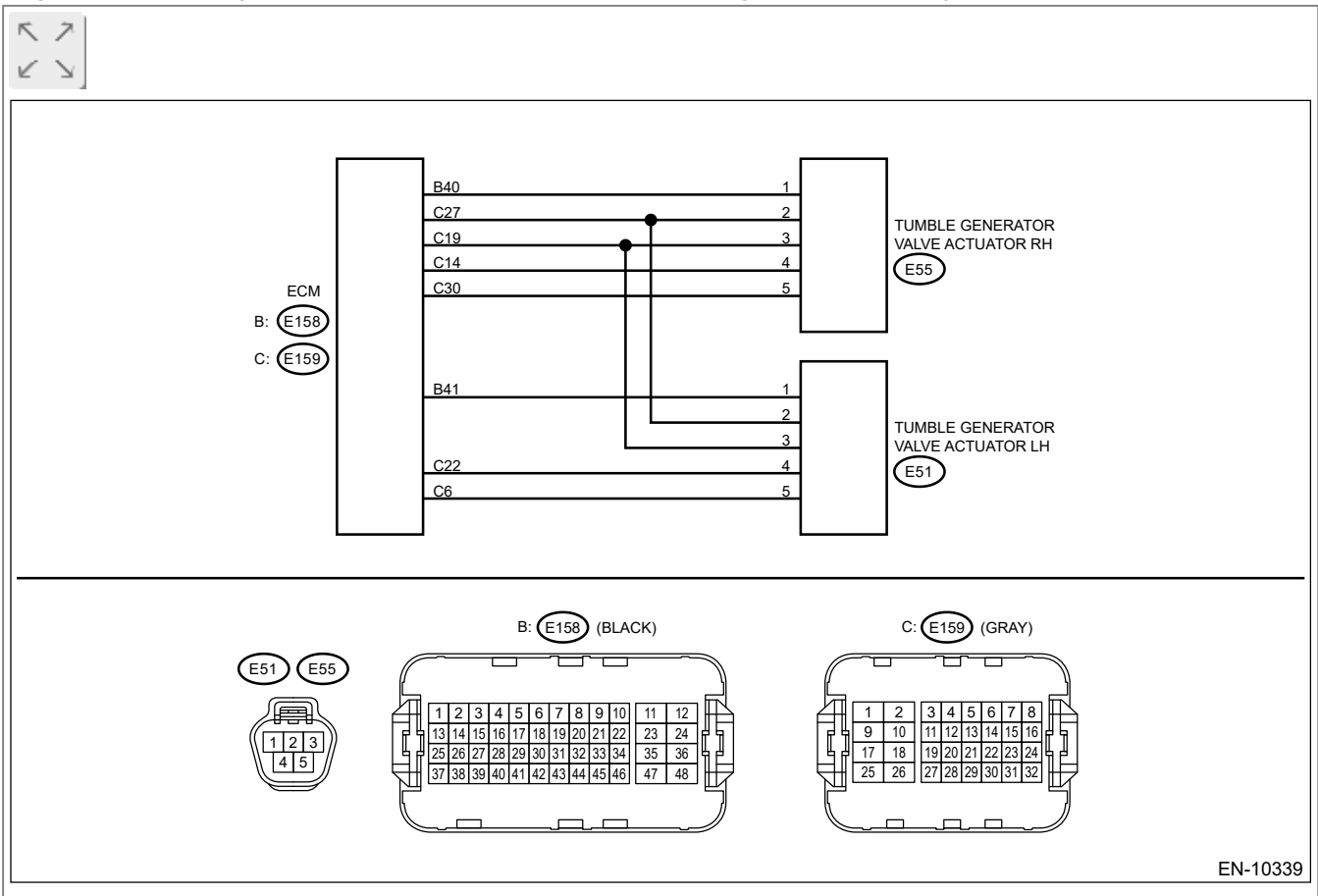
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



EN-10339

1. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the voltage between ECM and engine ground.

Connector & terminal

(E159) No. 14 (+) — Engine ground (-):


(E159) No. 30 (+) — Engine ground (–):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in harness between ECM and tumble generator valve actuator RH connector.

No

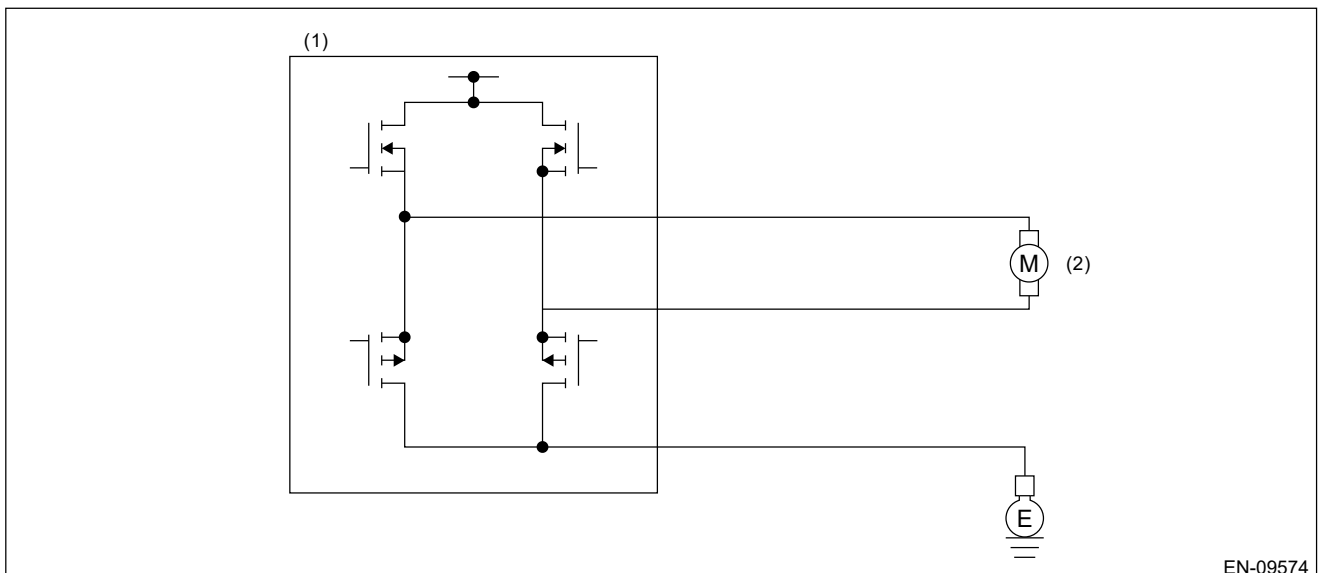
Replace the tumble generator valve actuator RH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Tumble Generator Valve Actuator.](#)

1. OUTLINE OF DIAGNOSIS

Detect the short circuit of tumble generator valve motor.

Judge as NG when the overcurrent signal is sent from IC after tumble generator valve driving IC diagnosis.

2. COMPONENT DESCRIPTION



EN-09574

(1) Engine control module (ECM) (2) Tumble generator valve

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Tumble generator valve drive signal	Open or Closed

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Overcurrent signal from tumble generator valve drive IC	ON

Time needed for diagnosis: 320 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2012 TGV CONTROL CIRCUIT LOW BANK 2

DTC detecting condition:

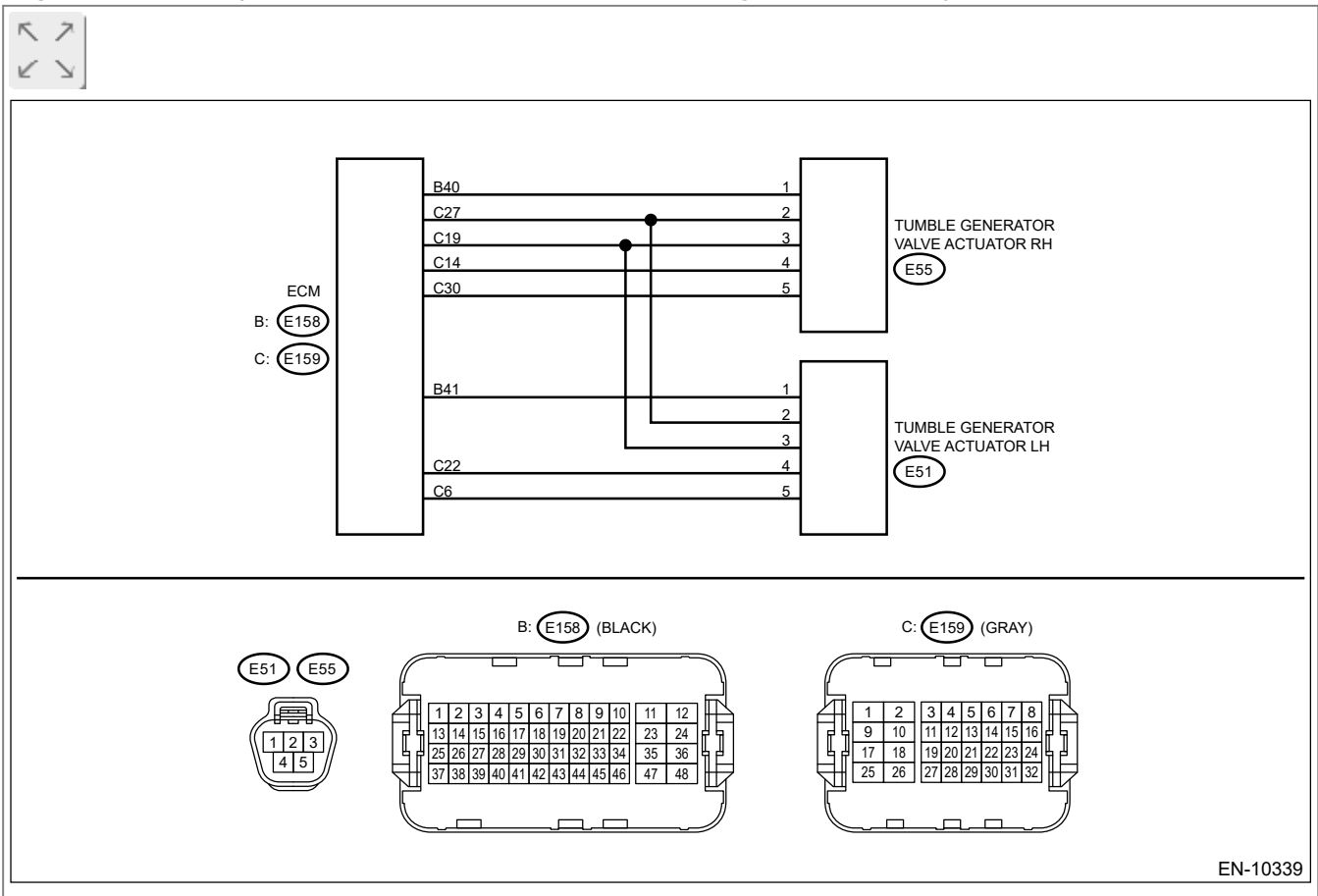
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR LH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the voltage between ECM and engine ground.

Connector & terminal

(E159) No. 6 (+) – Engine ground (-):


(E159) No. 22 (+) — Engine ground (—):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in harness between ECM and tumble generator valve actuator LH connector.

No

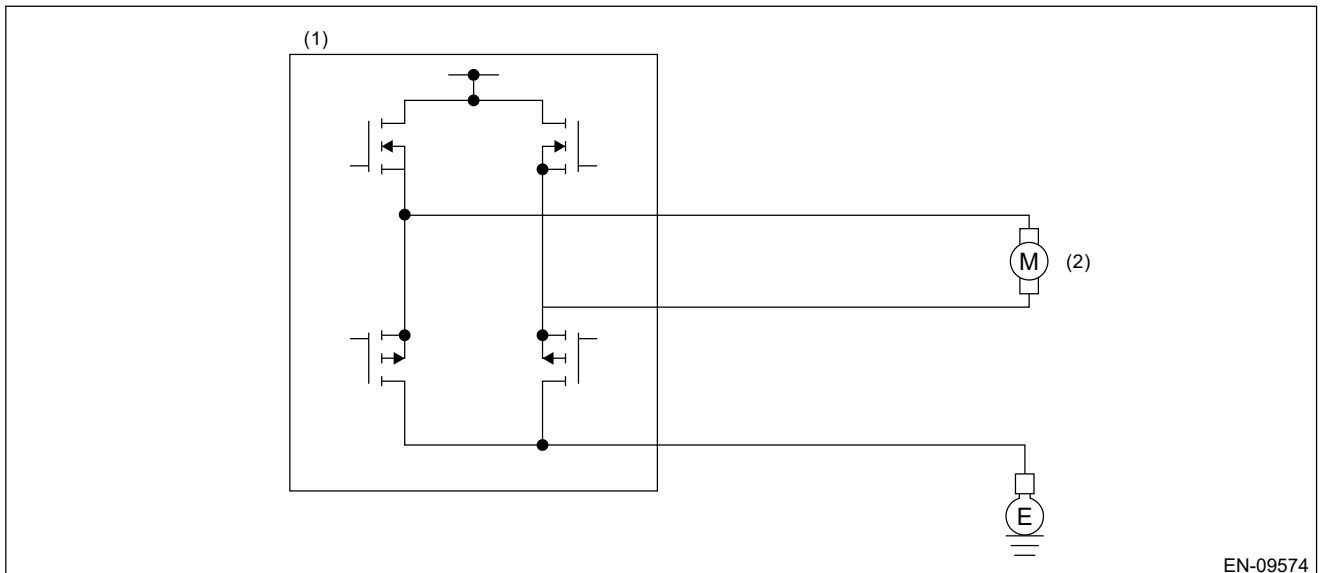
Replace the tumble generator valve actuator LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Tumble Generator Valve Actuator.](#)

1. OUTLINE OF DIAGNOSIS

Detect the short circuit of tumble generator valve motor.

Judge as NG when the overcurrent signal is sent from IC after tumble generator valve driving IC diagnosis.

2. COMPONENT DESCRIPTION



3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Tumble generator valve drive signal	Open or Closed

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Overcurrent signal from tumble generator valve drive IC	ON

Time needed for diagnosis: 320 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2016 TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 1



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

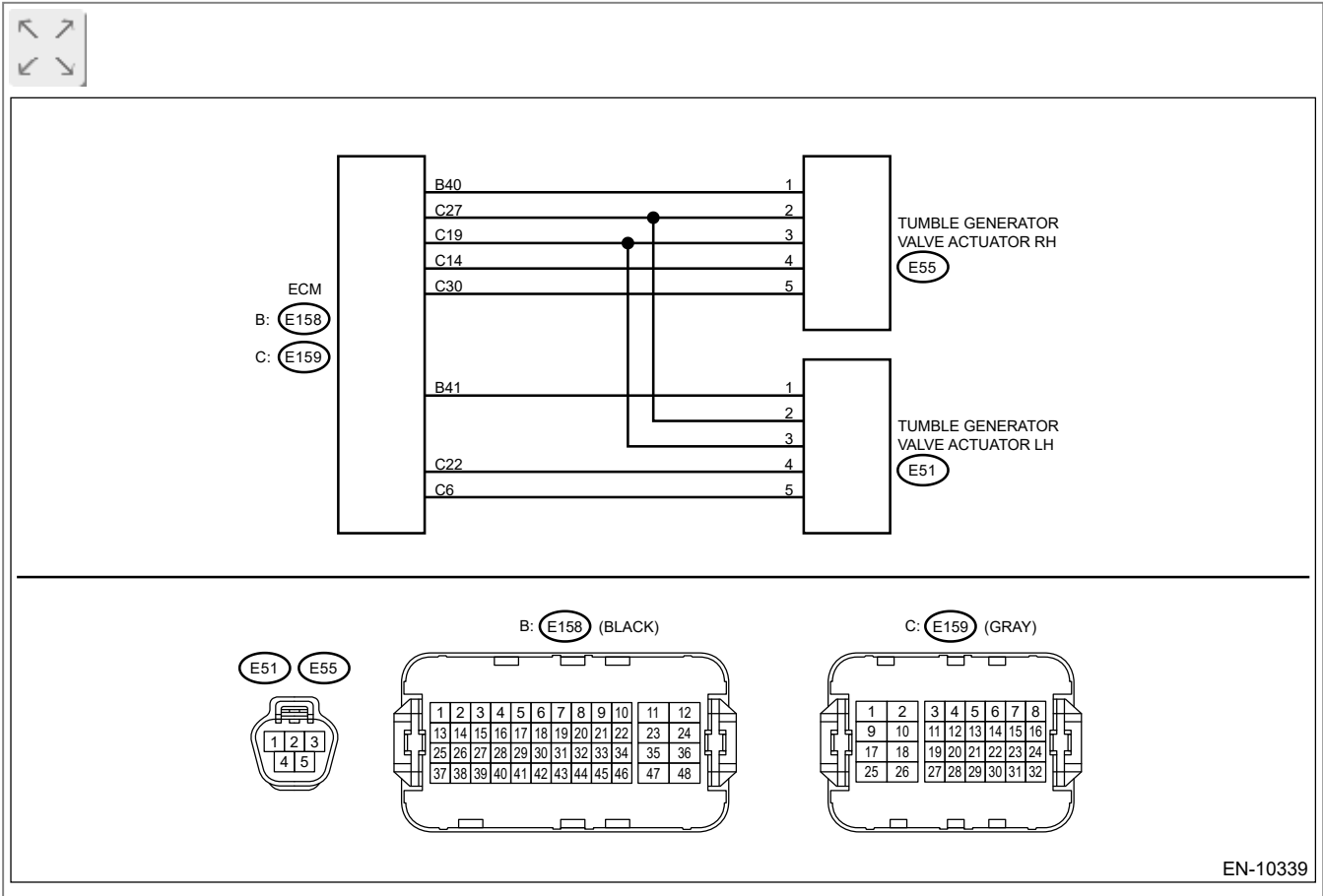
- Improper idling
- Engine stalls.
- Poor driving performance

Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:


Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK CURRENT DATA.


1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [TGV Position Sensor R].

Note:

For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

Is the value of [TGV Position Sensor R] less than 0.2 V?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK POWER SUPPLY OF TUMBLE GENERATOR VALVE ACTUATOR RH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from tumble generator valve actuator RH.
3. Turn the ignition switch to ON.
4. Measure the voltage between tumble generator valve actuator RH connector and engine ground.

Connector & terminal

(E55) No. 3 (+) — Engine ground (—):

Is the voltage 4.5 V or more?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and tumble generator valve actuator RH connector**
- **Poor contact of ECM connector**

3. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM and tumble generator valve actuator RH connector.

Connector & terminal

(E158) No. 40 — (E55) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Repair the open circuit in harness between ECM and tumble generator valve actuator RH connector.

4. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH CONNECTOR.

Measure the resistance between ECM and engine ground.

Connector & terminal

(E158) No. 40 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM and tumble generator valve actuator RH connector.

5. CHECK FOR POOR CONTACT.


Check for poor contact of ECM and tumble generator valve actuator RH connector.

Is there poor contact of ECM or the tumble generator valve actuator RH connector?

Yes

Repair the poor contact of ECM or tumble generator valve actuator RH connector.

No

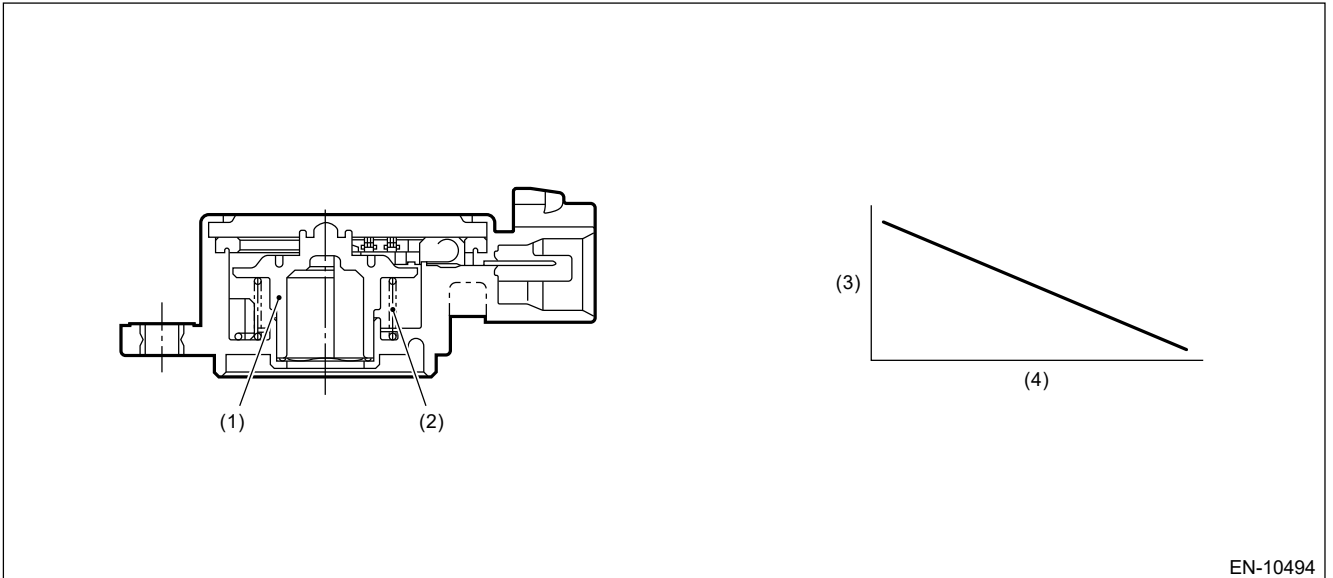
Replace the tumble generator valve actuator RH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Tumble Generator Valve Assembly.](#)

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of tumble generator valve position sensor.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-10494

(1) Rotor

(3) Voltage (V)

(4) Tumble generator valve opening angle (°)

(2) Return spring

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	< 0.21 V

Time needed for diagnosis: 520 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2017 TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 1



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

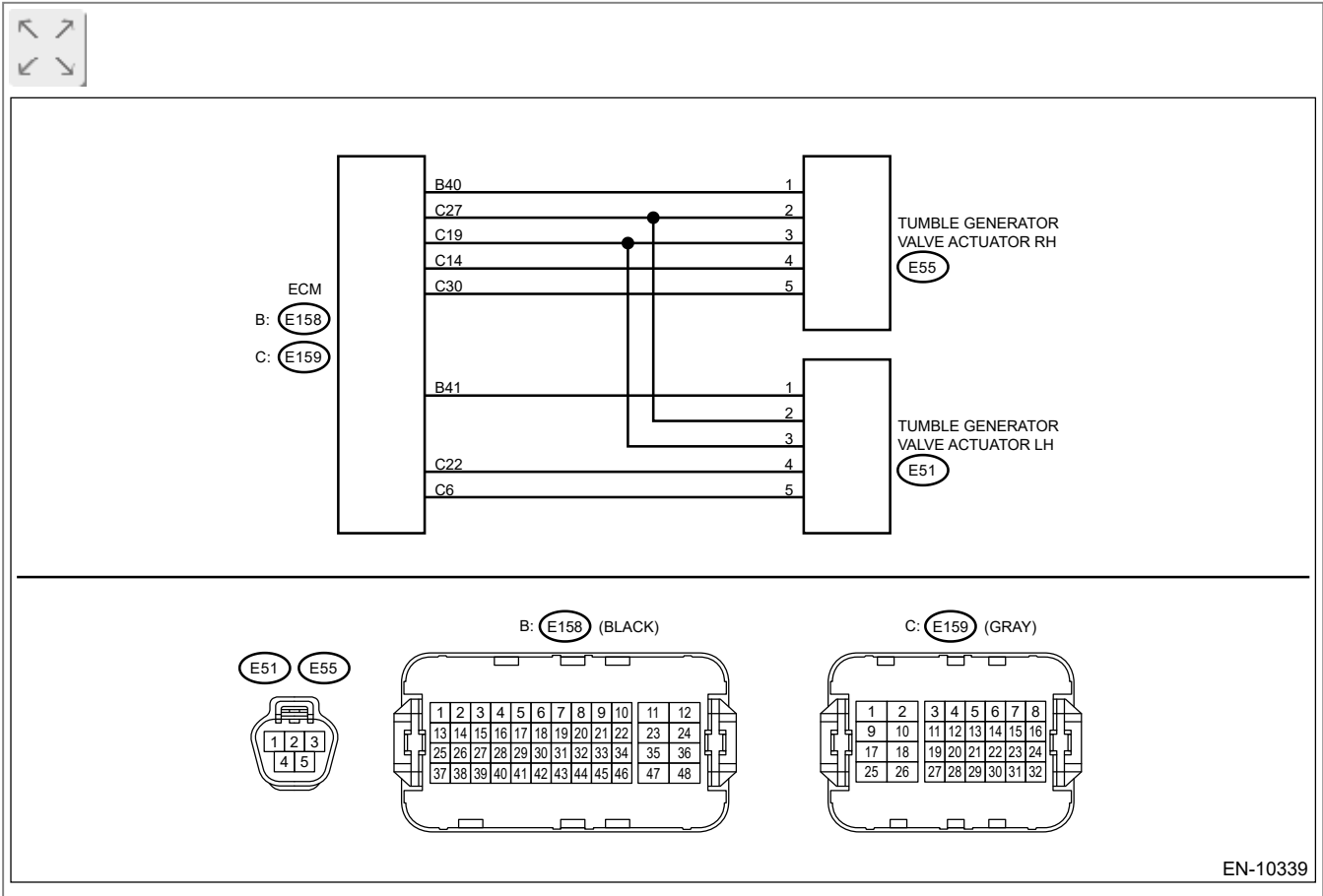
- Improper idling
- Engine stalls.
- Poor driving performance

Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.




EN-10339

1. CHECK CURRENT DATA.


1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [TGV Position Sensor R].

Note:

For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

Is the value of [TGV Position Sensor R] 5 V or more?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from tumble generator valve actuator RH.
3. Start the engine.
4. Using the Subaru Select Monitor, read the value in [TGV Position Sensor R].

Note:

For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

Is the value of [TGV Position Sensor R] 5 V or more?

Yes

Repair the short circuit to power in harness between ECM and tumble generator valve actuator RH connector.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between tumble generator valve actuator RH connector and engine ground.

Connector & terminal

(E55) No. 2 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and tumble generator valve actuator RH connector**
- **Poor contact of ECM connector**

4. CHECK FOR POOR CONTACT.




Check for poor contact of tumble generator valve actuator RH connector.

Is there poor contact of the tumble generator valve actuator RH connector?

Yes

Repair the poor contact of tumble generator valve actuator RH connector.

No

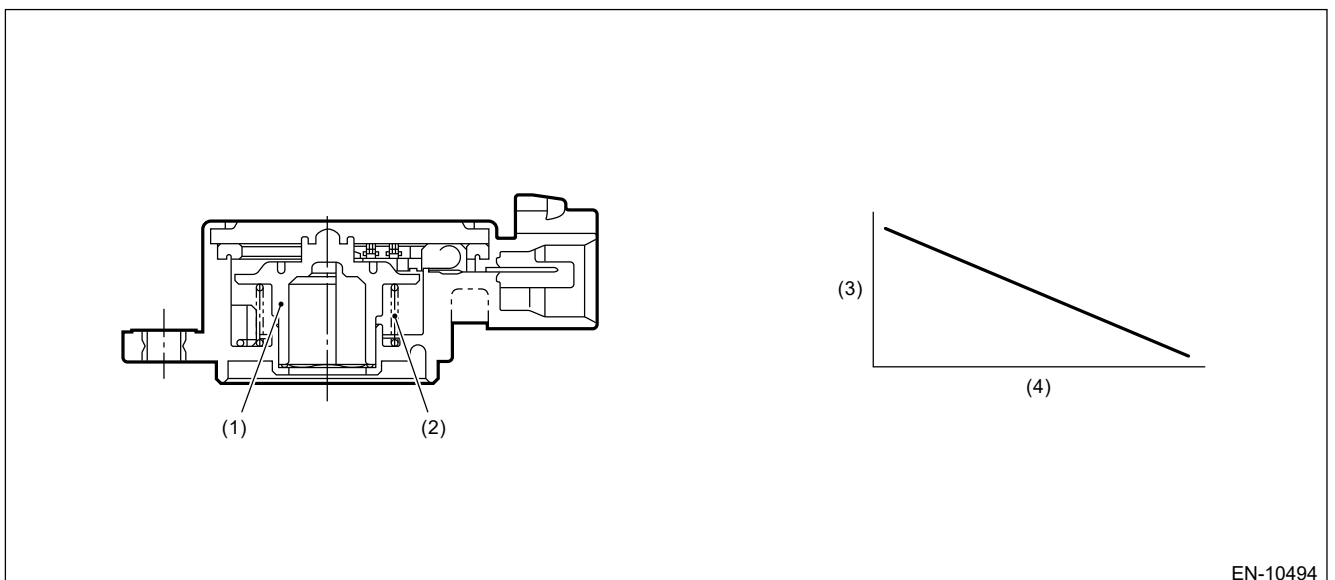
Replace the tumble generator valve actuator RH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Tumble Generator Valve Assembly.](#)

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of tumble generator valve position sensor.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Rotor

(3) Voltage (V)

(4) Tumble generator valve opening angle (°)

(2) Return spring

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	> 4.47 V

Time needed for diagnosis: 520 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2021 TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 2



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

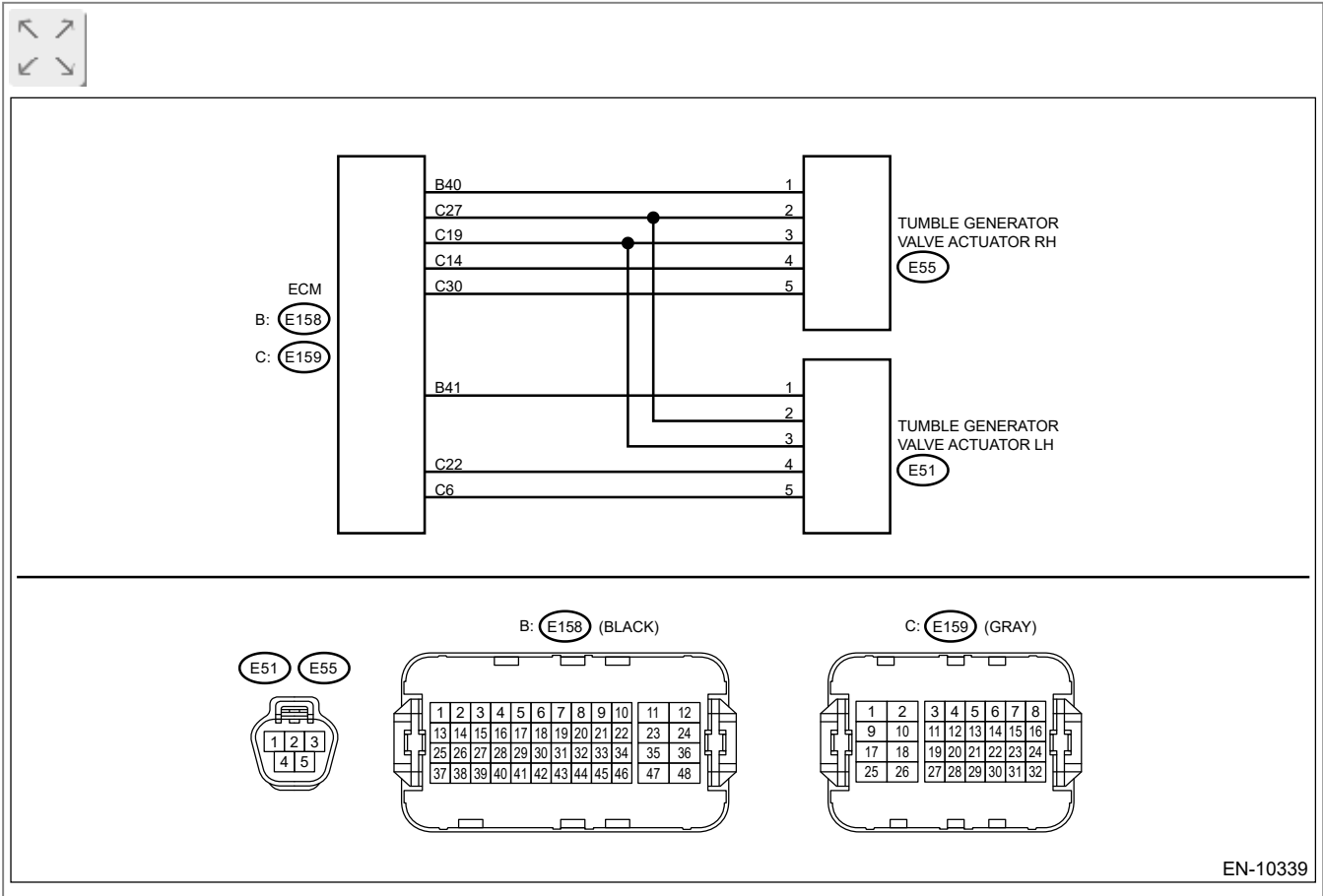
- Improper idling
- Engine stalls.
- Poor driving performance

Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:


Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK CURRENT DATA.


1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [TGV Position Sensor L].

Note:

For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

Is the value of [TGV Position Sensor L] less than 0.2 V?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK POWER SUPPLY OF TUMBLE GENERATOR VALVE ACTUATOR LH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from tumble generator valve actuator LH.
3. Turn the ignition switch to ON.
4. Measure the voltage between tumble generator valve actuator LH connector and engine ground.

Connector & terminal

(E51) No. 3 (+) — Engine ground (—):

Is the voltage 4.5 V or more?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and tumble generator valve actuator LH connector**
- **Poor contact of ECM connector**

3. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR LH CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM and tumble generator valve actuator LH connector.

Connector & terminal

(E158) No. 41 — (E51) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Repair the open circuit in harness between ECM and tumble generator valve actuator LH connector.

4. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR LH CONNECTOR.


Measure the resistance between ECM and engine ground.

Connector & terminal

(E158) No. 41 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM and tumble generator valve actuator LH connector.

5. CHECK FOR POOR CONTACT.


Check for poor contact of ECM and tumble generator valve actuator LH connector.

Is there poor contact of ECM or the tumble generator valve actuator LH connector?

Yes

Repair the poor contact of ECM or tumble generator valve actuator LH connector.

No

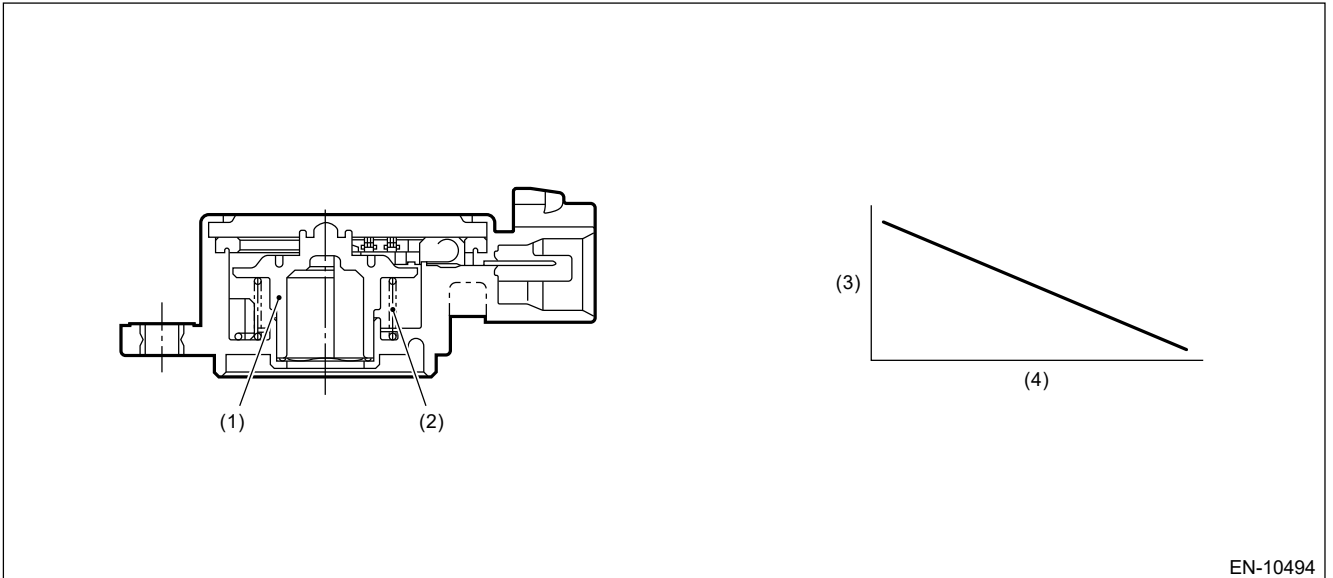
Replace the tumble generator valve actuator LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Tumble Generator Valve Assembly.](#)

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of tumble generator valve position sensor.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-10494

(1) Rotor

(3) Voltage (V)

(4) Tumble generator valve opening angle (°)

(2) Return spring

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	< 0.21 V

Time needed for diagnosis: 520 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2022 TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 2



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

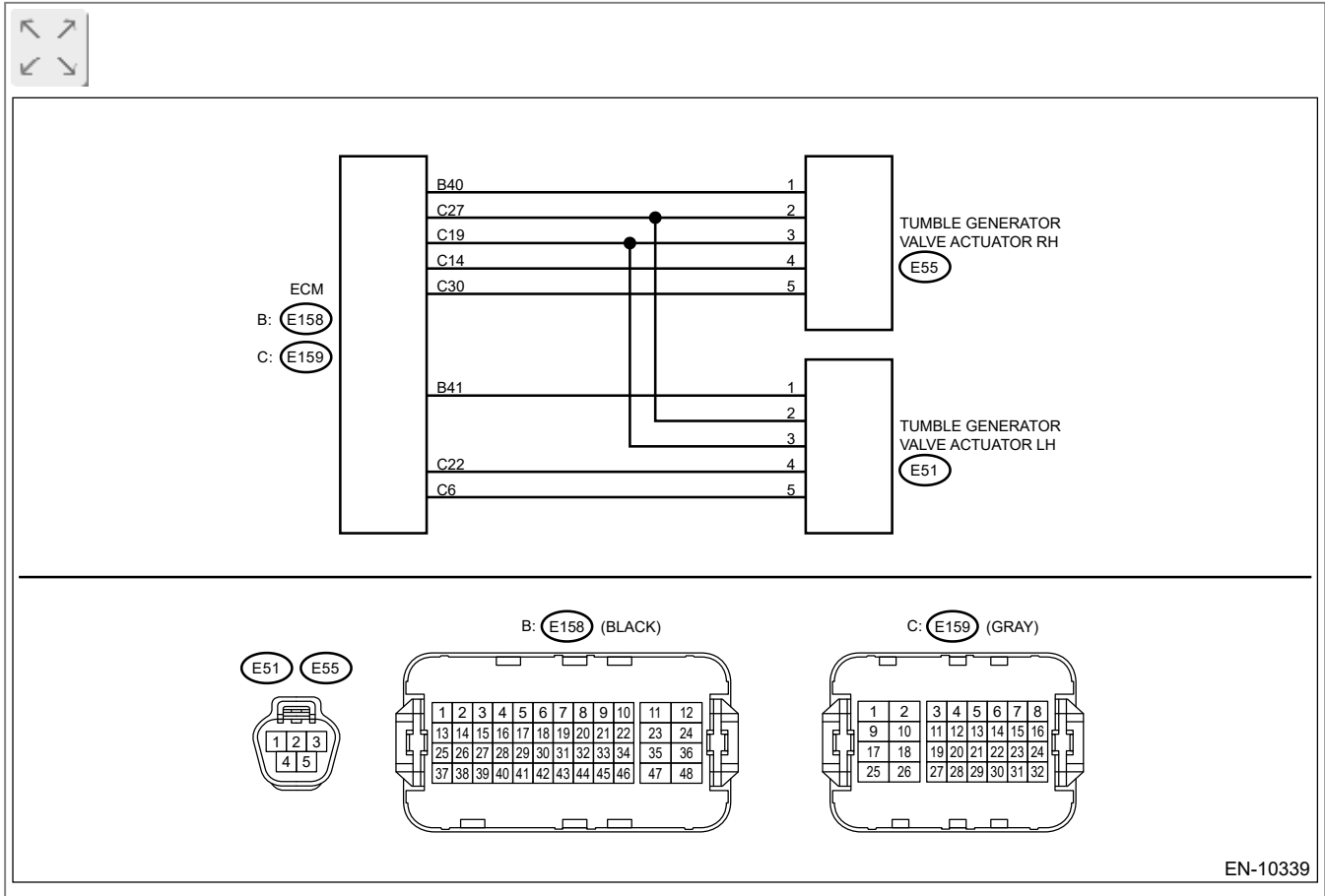
- Improper idling
- Engine stalls.
- Poor driving performance

Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:


Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK CURRENT DATA.


1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [TGV Position Sensor L].

Note:

For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

Is the value of [TGV Position Sensor L] 5 V or more?

Yes

 [Go to 2.](#)

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR LH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from tumble generator valve actuator LH.
3. Start the engine.
4. Using the Subaru Select Monitor, read the value in [TGV Position Sensor L].

Note:

For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

Is the value of [TGV Position Sensor L] 5 V or more?

Yes

Repair the short circuit to power in harness between ECM and tumble generator valve actuator LH connector.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR LH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between tumble generator valve actuator LH connector and engine ground.

Connector & terminal

(E51) No. 2 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and tumble generator valve actuator LH connector**
- **Poor contact of ECM connector**

4. CHECK FOR POOR CONTACT.




Check for poor contact of tumble generator valve actuator LH connector.

Is there poor contact of the tumble generator valve actuator LH connector?

Yes

Repair the poor contact of tumble generator valve actuator LH connector.

No

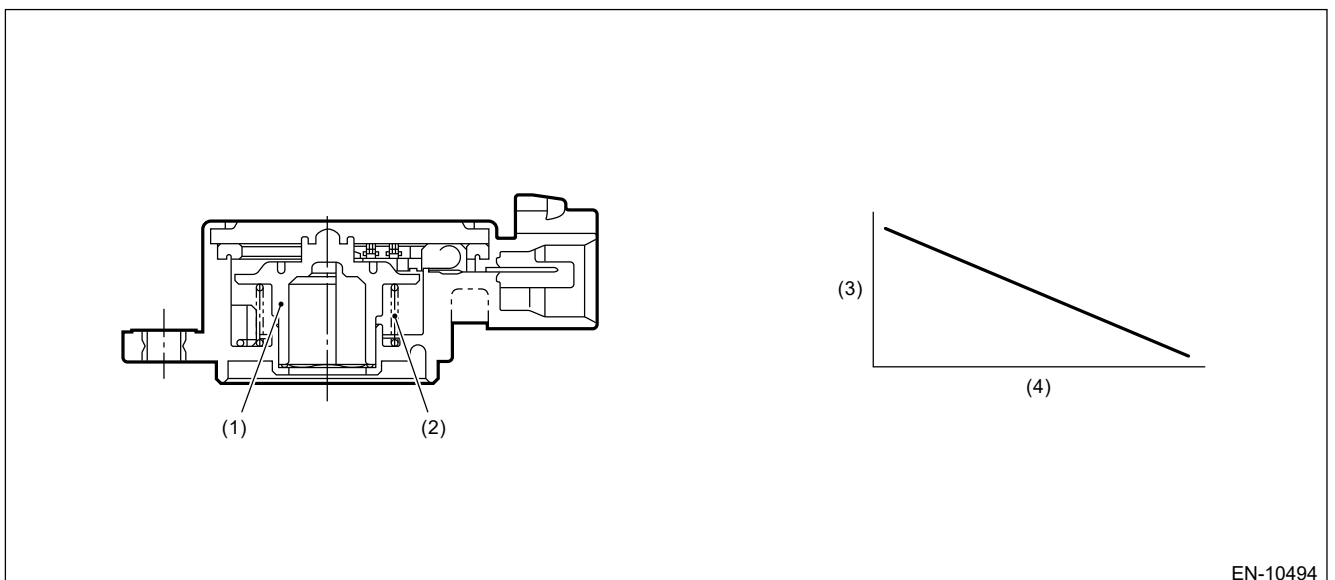
Replace the tumble generator valve actuator LH.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Tumble Generator Valve Assembly.](#)

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of tumble generator valve position sensor.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Rotor

(3) Voltage (V)

(4) Tumble generator valve opening angle (°)

(2) Return spring

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	> 4.47 V

Time needed for diagnosis: 520 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2096 POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1

DTC detecting condition:

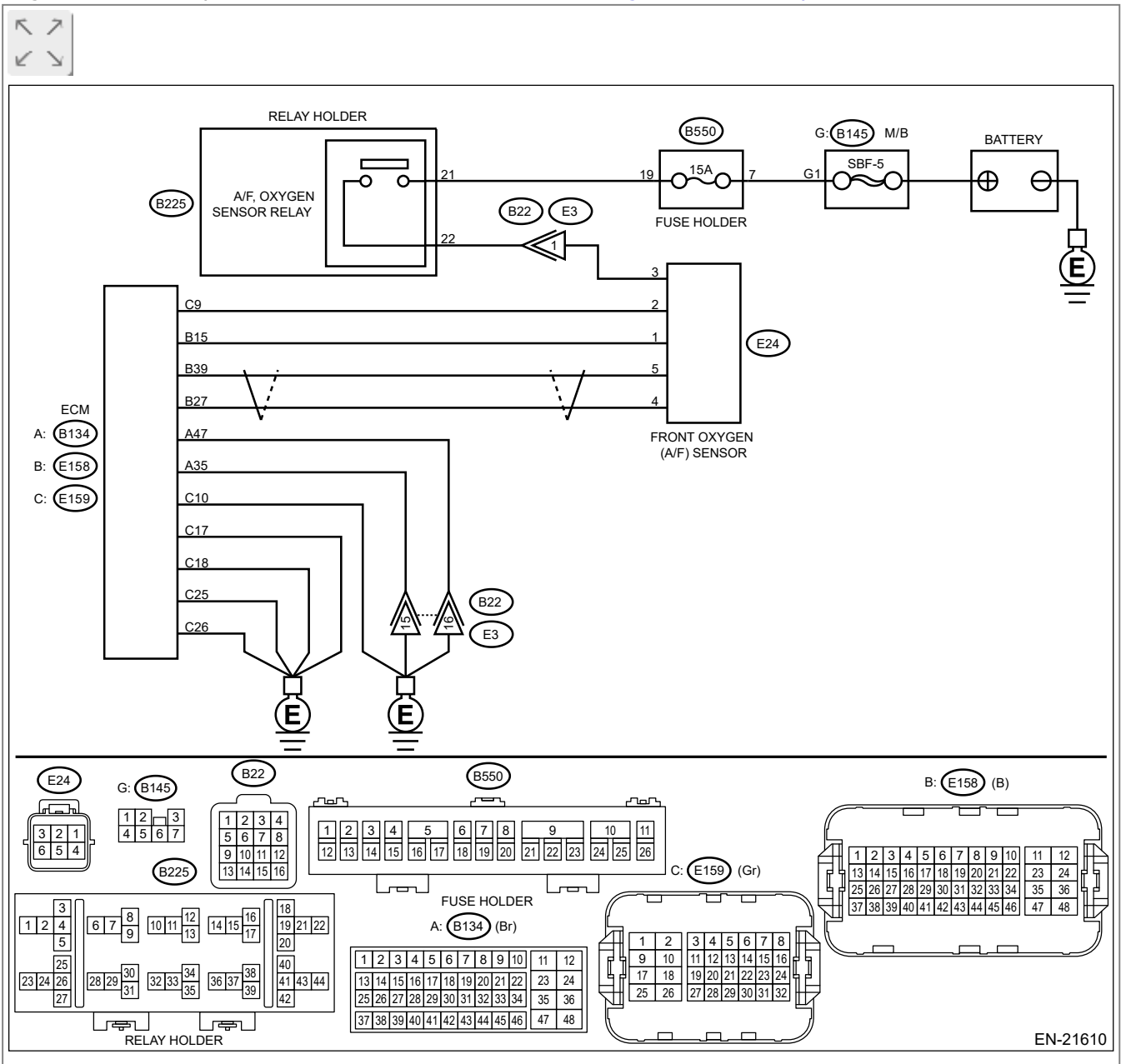
Detected when two consecutive driving cycles with fault occur.

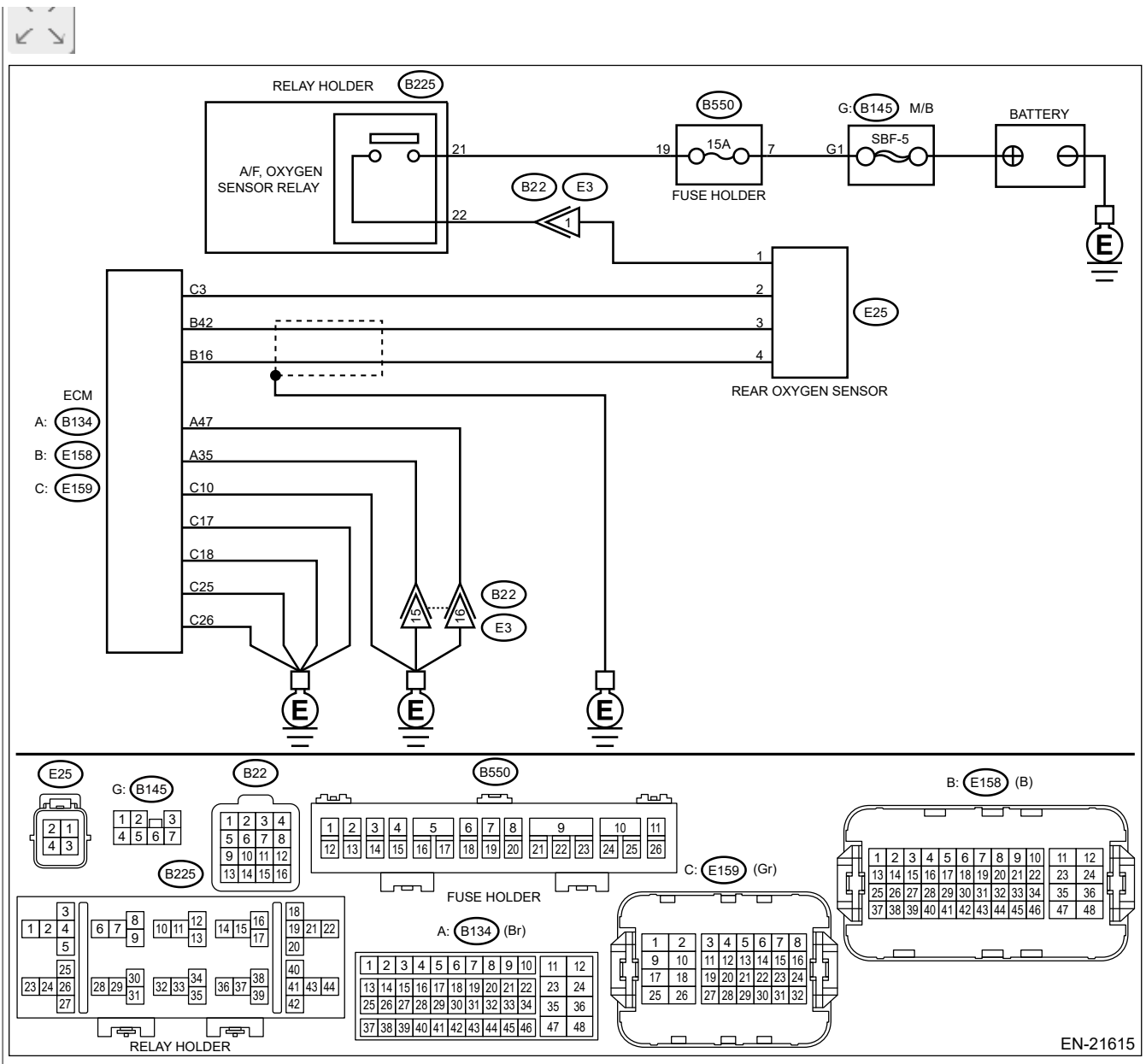
Caution:

- After servicing or replacing faulty parts, perform Clear Memory Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21615

1. CHECK FOR ANY OTHER DTC ON DISPLAY.



Is any other DTC displayed?

Yes

Check DTC using "List of Diagnostic Trouble Code (DTC)". Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 2.](#)

2. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.



Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.

Connector & terminal

(E158) No. 15 — (E24) No. 1:

(E158) No. 27 — (E24) No. 4:

(E158) No. 39 — (E24) No. 5:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and front oxygen (A/F) sensor connector**
- **Poor contact of coupling connector**

4. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

Measure the resistance between ECM and chassis ground.

Connector & terminal

(B158) No. 15 — Chassis ground:

(B158) No. 27 — Chassis ground:

(B158) No. 39 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the ground short circuit of harness between ECM and front oxygen (A/F)

sensor connector.

5. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.

Connector & terminal

(E24) No. 1 (+) — Chassis ground (-):

(E24) No. 4 (+) — Chassis ground (-):

(E24) No. 5 (+) — Chassis ground (-):

Is the voltage 8 V or more?

Yes

Repair the short circuit to power in the harness between ECM and front oxygen (A/F) sensor connector.

No

 [Go to 6.](#)

6. CHECK EXHAUST SYSTEM.

Are there holes or loose bolts on exhaust system?

Yes

Repair the exhaust system.

No

 [Go to 7.](#)

7. CHECK AIR INTAKE SYSTEM.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes

Repair the air intake system.

No

 [Go to 8.](#)


8. CHECK FUEL PRESSURE.

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.


1. Connect the front oxygen (A/F) sensor connector.
2. Measure the fuel pressure.  [Ref. to MECHANICAL\(H4DOTC\)>Fuel Pressure>INSPECTION.](#)

Caution:



Release fuel pressure before removing the fuel pressure gauge.

Is the measured value 328 — 358 kPa (3.3 — 3.7 kgf/cm², 48 — 52 psi)?

Yes

 [Go to 9.](#)


No

Check the fuel pump and fuel delivery line.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pump>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Delivery and Evaporation Lines>INSPECTION.](#)

9. CHECK ENGINE COOLANT TEMPERATURE SENSOR.


1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Coolant Temp.].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Coolant Temp.] 75°C (167°F) or more?

Yes

 [Go to 10.](#)

No


Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Coolant Temperature Sensor.](#)

10. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. Place the select lever in "P" range or "N" range.
3. Turn the A/C switch to OFF.


4. Turn all the accessory switches to OFF.
5. Using the Subaru Select Monitor or a general scan tool, read the value of [Air Flow Rate from Mass Air Flow Sensor].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Air Flow Rate from Mass Air Flow Sensor] 2.0 — 5.0 g/s (0.26 — 0.66 lb/s)?

Yes

 [Go to 11.](#)


No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

11. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.


1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. Place the select lever in "P" range or "N" range.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Open the front hood.
6. Measure the ambient temperature.
7. Using the Subaru Select Monitor or a general scan tool, read the value of [Intake Air Temperature (B1-S1)].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Subtract ambient temperature from [Intake Air Temperature (B1-S1)]. Is the obtained value -10 — 50°C (-18 — 90°F)?

Yes

 [Go to 12.](#)


No

Check the mass air flow and intake air temperature sensor.  [Ref. to FUEL](#)

12. CHECK REAR OXYGEN SENSOR DATA.


1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and keep the engine speed at 3,000 rpm. (2 minutes maximum)
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Bank 1 - Sensor 2 present at that location].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Bank 1 - Sensor 2 present at that location] 0.490 V or more?

Yes

 [Go to 13.](#)


No

 [Go to 14.](#)

13. CHECK REAR OXYGEN SENSOR DATA.


1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and rapidly reduce the engine speed from 3,000 rpm.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Bank 1 - Sensor 2 present at that location].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Bank 1 - Sensor 2 present at that location] 0.250 V or more?

Yes

 [Go to 15.](#)

No

 [Go to 14.](#)

14. CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.




Has water entered the connector?

Yes

Completely remove any water inside.

No


 [Go to 16.](#)

15. CHECK FRONT OXYGEN (A/F) SENSOR USING REAR OXYGEN SENSOR SIGNAL.




1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), then keep the engine idling for 5 minutes or more.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Bank 1 - Sensor 2 present at that location].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Bank 1 - Sensor 2 present at that location] kept at 0.250 V or less for 5 minutes or more?

Yes

Replace the front oxygen (A/F) sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Front Oxygen \(A/F\) Sensor.](#)

No

 [Go to 16.](#)

16. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from rear oxygen sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and rear oxygen sensor connector.

Connector & terminal

(E158) No. 42 — (E25) No. 3:

(E158) No. 16 — (E25) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 17.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and rear oxygen sensor connector**
- **Poor contact of coupling connector**

17. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.


1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between rear oxygen sensor connector and chassis ground.

Connector & terminal

(E25) No. 4 (+) — Chassis ground (-):

Is the voltage 0.2 — 0.5 V?

Yes

Replace the rear oxygen sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Rear Oxygen Sensor.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

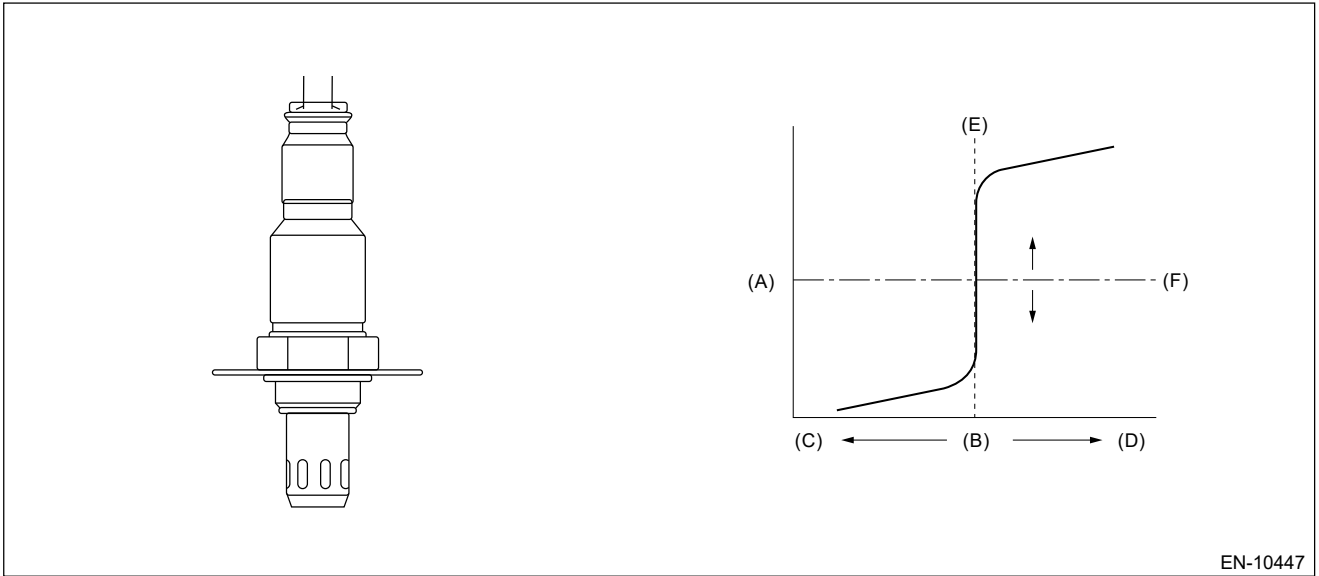
- **Open circuit in harness between ECM and rear oxygen sensor connector**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of fuel system from the size of the sub feedback learning value.

Control the sub feedback learning and judge as NG when the learning value is in the lean zone.

2. COMPONENT DESCRIPTION



EN-10447

(A) Electromotive force

(B) Air fuel ratio

(C) Lean

(D) Rich

(E) Theoretical air fuel ratio

(F) Comparative voltage

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Sub feedback	In operation

4. GENERAL DRIVING CYCLE

Perform the diagnosis every time after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sub feedback learning value	≤ -0.024

Time needed for diagnosis: 1 second

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2097 POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1

DTC detecting condition:

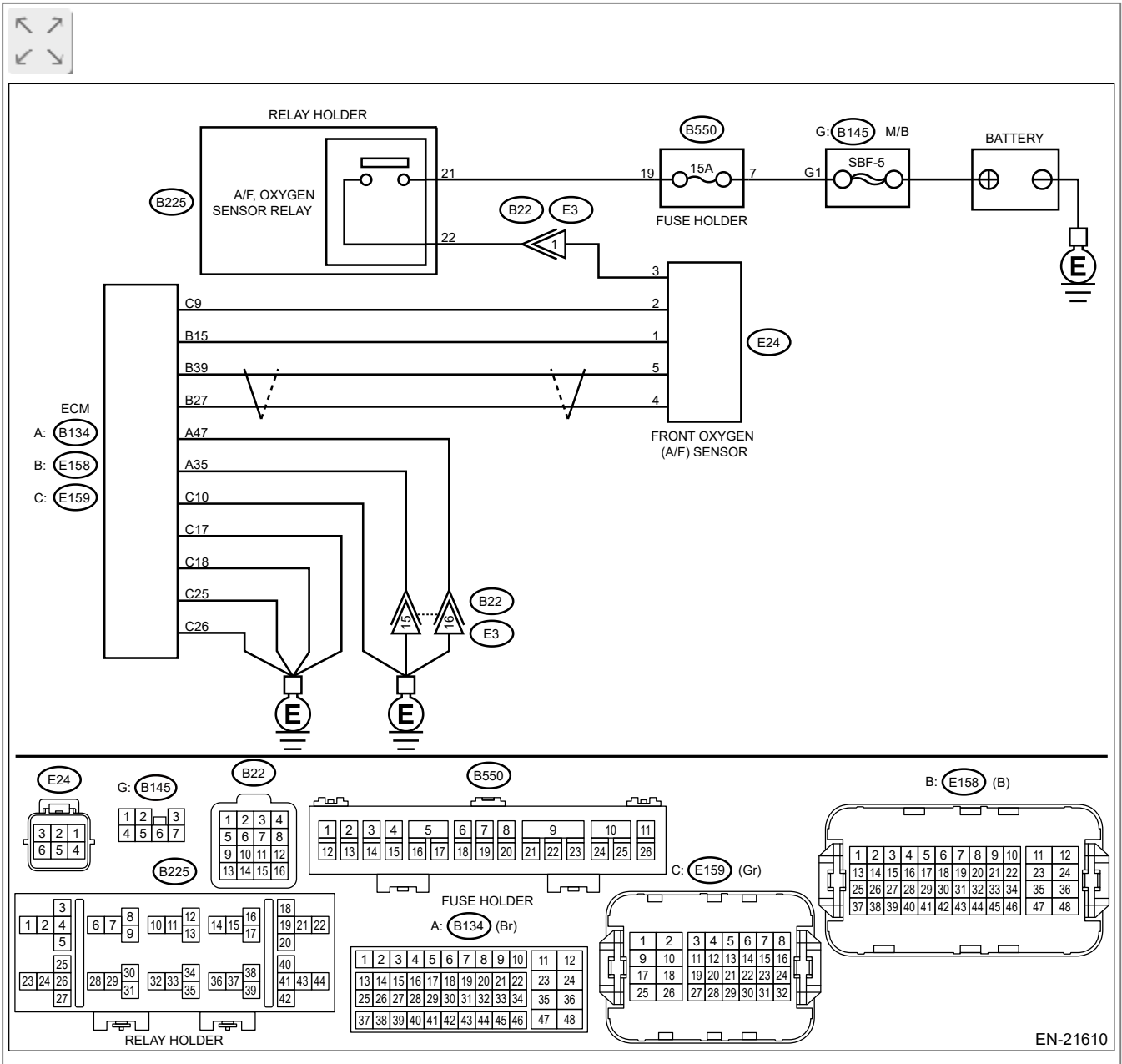
Detected when two consecutive driving cycles with fault occur.

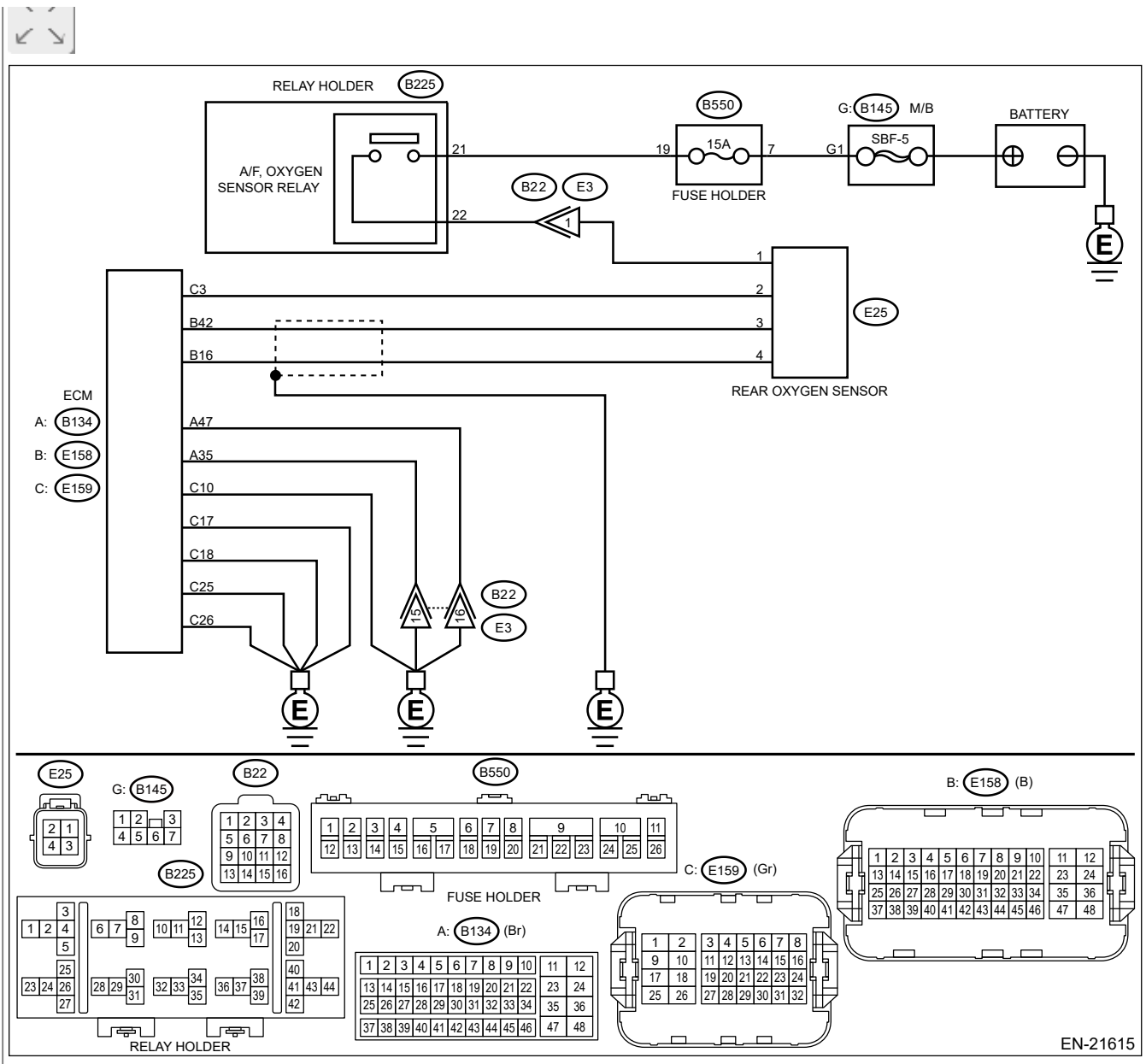
Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check DTC using "List of Diagnostic Trouble Code (DTC)". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 2.](#)


2. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.

Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.

Connector & terminal

(E158) No. 15 — (E24) No. 1:

(E158) No. 27 — (E24) No. 4:

(E158) No. 39 — (E24) No. 5:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and front oxygen (A/F) sensor connector**
- **Poor contact of coupling connector**

4. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

Measure the resistance between ECM and chassis ground.

Connector & terminal

(E158) No. 15 — Chassis ground:

(E158) No. 27 — Chassis ground:

(E158) No. 39 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the ground short circuit of harness between ECM and front oxygen (A/F)

sensor connector.

5. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.

Connector & terminal

(E24) No. 1 (+) — Chassis ground (-):

(E24) No. 4 (+) — Chassis ground (-):

(E24) No. 5 (+) — Chassis ground (-):

Is the voltage 8 V or more?

Yes

Repair the short circuit to power in the harness between ECM and front oxygen (A/F) sensor connector.

No

 [Go to 6.](#)

6. CHECK EXHAUST SYSTEM.

Are there holes or loose bolts on exhaust system?

Yes

Repair the exhaust system.

No

 [Go to 7.](#)

7. CHECK AIR INTAKE SYSTEM.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes

Repair the air intake system.

No

 [Go to 8.](#)


8. CHECK FUEL PRESSURE.

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.


1. Connect the front oxygen (A/F) sensor connector.
2. Measure the fuel pressure.  [Ref. to MECHANICAL\(H4DOTC\)>Fuel Pressure>INSPECTION.](#)

Caution:



Release fuel pressure before removing the fuel pressure gauge.

Is the measured value 328 — 358 kPa (3.3 — 3.7 kgf/cm², 48 — 52 psi)?

Yes

 [Go to 9.](#)


No

Check the fuel pump and fuel delivery line.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pump>INSPECTION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Delivery and Evaporation Lines>INSPECTION.](#)

9. CHECK ENGINE COOLANT TEMPERATURE SENSOR.


1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Coolant Temp.].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Coolant Temp.] 75°C (167°F) or more?

Yes

 [Go to 10.](#)

No


Replace the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Coolant Temperature Sensor.](#)

10. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. Place the select lever in "P" range or "N" range.
3. Turn the A/C switch to OFF.


4. Turn all the accessory switches to OFF.
5. Using the Subaru Select Monitor or a general scan tool, read the value of [Air Flow Rate from Mass Air Flow Sensor].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Air Flow Rate from Mass Air Flow Sensor] 2.0 — 5.0 g/s (0.26 — 0.66 lb/s)?

Yes

 [Go to 11.](#)


No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

11. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.


1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. Place the select lever in "P" range or "N" range.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Open the front hood.
6. Measure the ambient temperature.
7. Using the Subaru Select Monitor or a general scan tool, read the value of [Intake Air Temperature (B1-S1)].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Subtract ambient temperature from [Intake Air Temperature (B1-S1)]. Is the obtained value -10 — 50°C (-18 — 90°F)?

Yes

 [Go to 12.](#)


No

Check the mass air flow and intake air temperature sensor.  [Ref. to FUEL](#)

12. CHECK REAR OXYGEN SENSOR DATA.


1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and keep the engine speed at 3,000 rpm. (2 minutes maximum)
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Bank 1 - Sensor 2 present at that location].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Bank 1 - Sensor 2 present at that location] 0.490 V or more?

Yes

 [Go to 13.](#)


No

 [Go to 14.](#)

13. CHECK REAR OXYGEN SENSOR DATA.


1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and rapidly reduce the engine speed from 3,000 rpm.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Bank 1 - Sensor 2 present at that location].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Bank 1 - Sensor 2 present at that location] 0.250 V or less?

Yes

 [Go to 15.](#)

No

 [Go to 14.](#)

14. CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.



Has water entered the connector?

Yes

Completely remove any water inside.

No

[Go to 16.](#)

15. CHECK FRONT OXYGEN (A/F) SENSOR USING REAR OXYGEN SENSOR SIGNAL.



1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), then keep the engine idling for 5 minutes or more.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Bank 1 - Sensor 2 present at that location].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the voltage of [Bank 1 - Sensor 2 present at that location] kept at 0.8 V or more for 5 minutes or more?

Yes

Replace the front oxygen (A/F) sensor. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Front Oxygen \(A/F\) Sensor.](#)

No

[Go to 16.](#)

16. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from rear oxygen sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and rear oxygen sensor connector.


Connector & terminal

(E158) No. 42 — (E25) No. 3:

(E158) No. 16 — (E25) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 17.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and rear oxygen sensor connector**
- **Poor contact of coupling connector**

17. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.


1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between rear oxygen sensor connector and chassis ground.

Connector & terminal

(E25) No. 4 (+) — Chassis ground (-):

Is the voltage 0.2 — 0.5 V?

Yes

Replace the rear oxygen sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Rear Oxygen Sensor.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

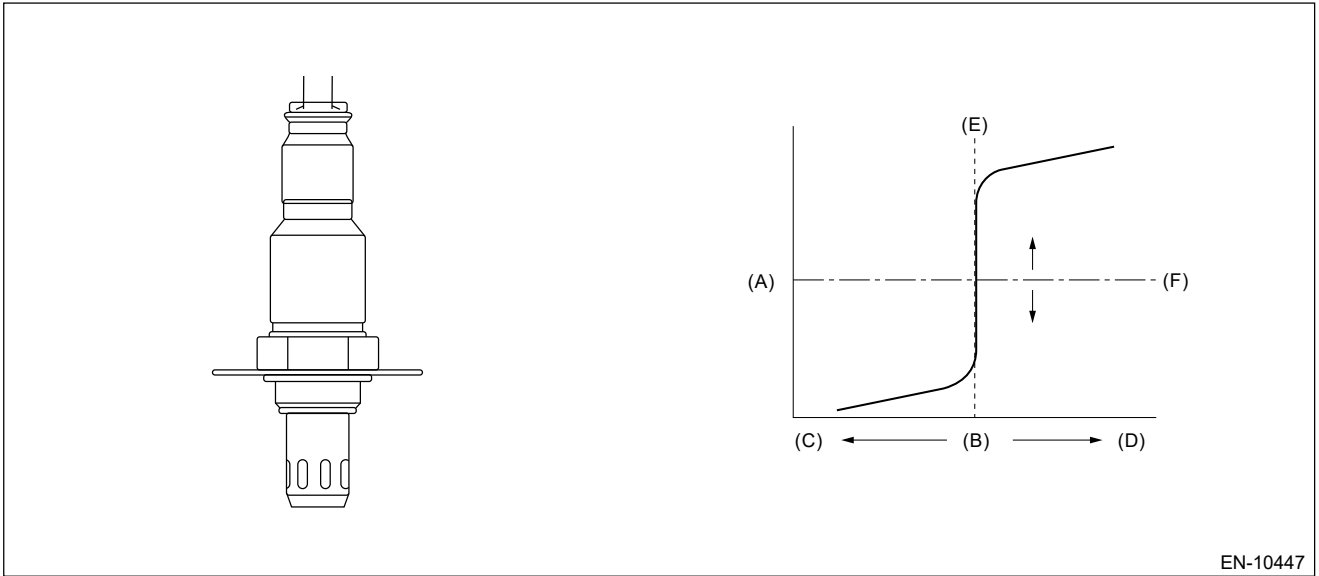
- **Open circuit in harness between ECM and rear oxygen sensor connector**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of fuel system from the size of the sub feedback learning value.

Sub feedback learning is being performed. When the learning value goes to the rich side, judge as NG.

2. COMPONENT DESCRIPTION



(A) Electromotive force

(B) Air fuel ratio

(C) Lean

(D) Rich

(E) Theoretical air fuel ratio

(F) Comparative voltage

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Sub feedback	In operation

4. GENERAL DRIVING CYCLE

Perform the diagnosis every time after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sub feedback learning value	≥ 0.026

Time needed for diagnosis: 1 second

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2101 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE


DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance
- Engine stalls.

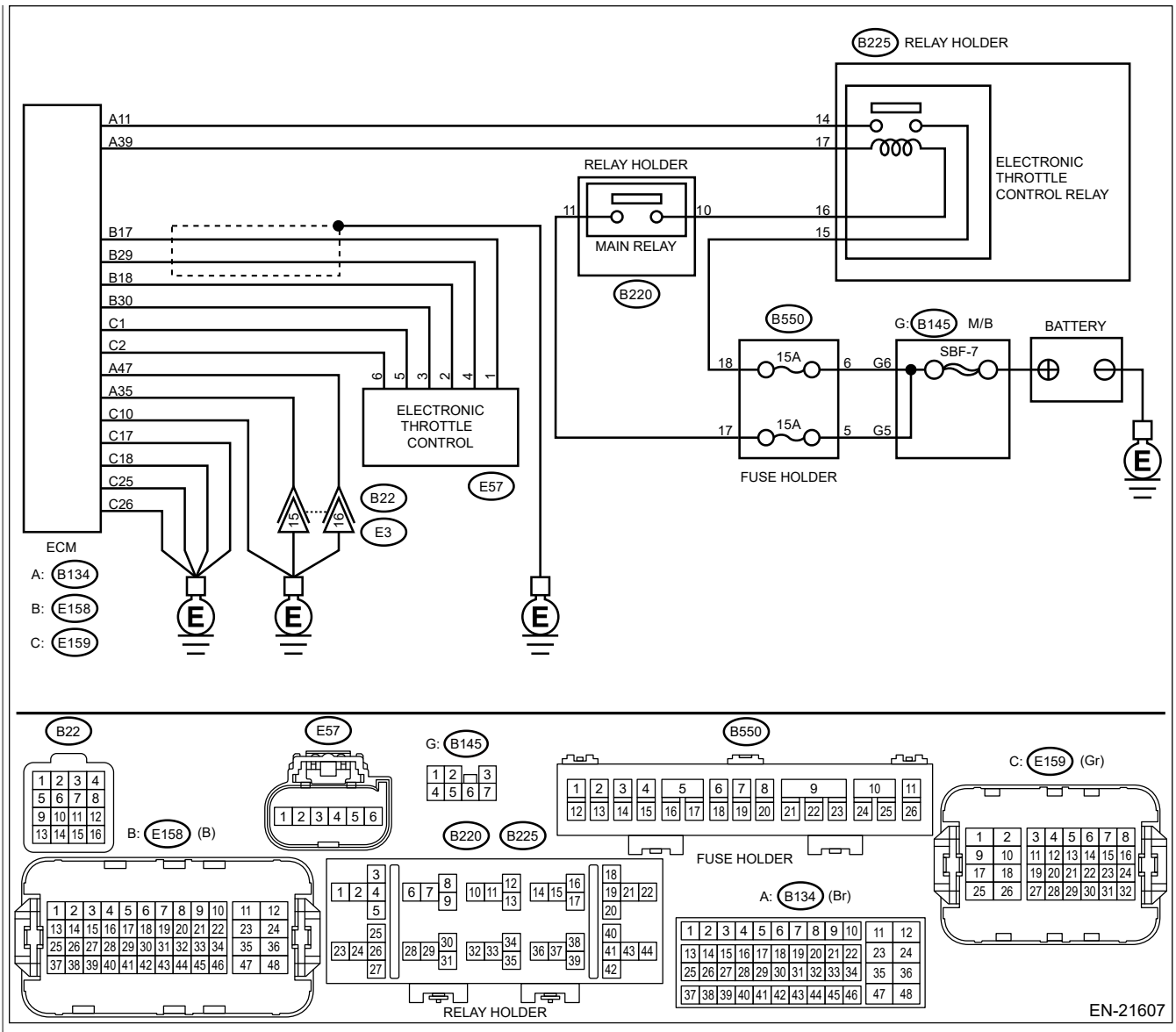
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode. and Inspection Mode !\[\]\(2c367d84c99049f9805eec6142b5bc5d_img.jpg\) \[Ref. to ENGINE \\(DIAGNOSTICS\\)\\(H4DOTC\\)>Inspection Mode.\]\(#\)](#)**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





EN-21607

1. CHECK ELECTRONIC THROTTLE CONTROL RELAY.



1. Turn the ignition switch to OFF.
2. Remove the electronic throttle control relay.
3. Connect the battery to terminals No. 16 and No. 17 of electronic throttle control relay.
4. Measure the resistance between electronic throttle control relay terminals.

Terminals

No. 14 – No. 15:

Is the resistance less than 1 Ω ?

Yes

[Go to 2.](#)

No

Replace the electronic throttle control relay. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Electronic Throttle Control Relay.](#)

2. CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY.



Measure the voltage between electronic throttle control relay connector and chassis ground.

Connector & terminal

(B225) No. 15 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 3.](#)

No

Repair the open or short to ground in the power supply circuit.

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY CONNECTOR.



1. Disconnect the connector from ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between electronic throttle control relay connector and chassis ground.

Connector & terminal


(B225) No. 17 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power in the harness between ECM and electronic throttle control relay connector.

No

 [Go to 4.](#)

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY CONNECTOR.



1. Turn the ignition switch to OFF.
2. Measure the resistance between electronic throttle control relay connector and chassis ground.


Connector & terminal

(B225) No. 14 — Chassis ground:

(B225) No. 17 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit in harness to ground between ECM and electronic throttle control relay connector.

5. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY CONNECTOR.

Measure the resistance between ECM and electronic throttle control relay connector.


Connector & terminal

(B134) No. 39 — (B225) No. 17:

(B134) No. 11 — (B225) No. 14:

Is the resistance less than 1 Ω ?

Yes

 [Go to 6.](#)

No

Repair the open circuit in harness between ECM and electronic throttle control relay connector.

6. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from electronic throttle control.
3. Measure the resistance between ECM and engine ground.

Connector & terminal

(E158) No. 18 — Engine ground:

(E158) No. 17 — Engine ground:

(E158) No. 17 — (E158) No. 28:

(E158) No. 29 — Engine ground:

(E158) No. 29 — (E158) No. 28:

Is the resistance 1 M Ω or more?

Yes

 [Go to 7.](#)

No

Repair the short circuit to ground in harness between ECM and electronic throttle control connector.

7. CHECK SHORT CIRCUIT INSIDE THE ECM.

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.


Connector & terminal

(E57) No. 1 — Engine ground:


(E57) No. 4 — Engine ground:

Is the resistance 220 k Ω or more?

Yes

 [Go to 8.](#)

No

Repair the short circuit to ground in harness between ECM and electronic throttle control connector. Replace the ECM if defective.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)

8. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM and electronic throttle control connector.

Connector & terminal

(E158) No. 17 — (E57) No. 1:

(E158) No. 30 — (E57) No. 3:

(E158) No. 29 — (E57) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 9.](#)

No

Repair the open circuit of harness between ECM and electronic throttle control connector.

9. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 3 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 10.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM and engine ground**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

10. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to ON.
2. Measure the voltage between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 1 (+) — Engine ground (–):


(E57) No. 4 (+) — Engine ground (–):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in harness between ECM and electronic throttle control connector.

No

 [Go to 11.](#)

11. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.


Connector & terminal

(E158) No. 18 — (E158) No. 17:

(E158) No. 18 — (E158) No. 29:

Is the resistance 1 MΩ or more?

Yes

 [Go to 12.](#)


No

Repair the short circuit to power in harness between ECM and electronic throttle control connector.

12. CHECK SENSOR OUTPUT.

1. Connect all connectors.
2. Start the engine and warm up completely.
3. Stop the engine, and then turn the ignition switch to ON (engine OFF).
4. Using the Subaru Select Monitor, read the value in [Main-Throttle Sensor].

Note:


For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

Is the value of [Main-Throttle Sensor] 0.60 — 0.65 V?

Yes

 [Go to 13.](#)

No

Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Throttle Body.](#)

13. CHECK SENSOR OUTPUT.


Using the Subaru Select Monitor, read the value in [Sub-Throttle Sensor].

Note:


For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

Is the value of [Sub-Throttle Sensor] 0.60 — 0.65 V?

Yes

 [Go to 14.](#)

No

Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Throttle Body.](#)

14. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from electronic throttle control.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM and electronic throttle control connector.


Connector & terminal

(E159) No. 1 — (E57) No. 5:

(E159) No. 2 — (E57) No. 6:

Is the resistance less than 1 Ω?

Yes

 [Go to 15.](#)

No

Repair the open circuit of harness between ECM and electronic throttle control.

15. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 5 (+) — Engine ground (—):


(E57) No. 6 (+) — Engine ground (—):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in harness between ECM and electronic throttle control connector.

No

 [Go to 16.](#)

16. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between electronic throttle control connector and engine ground.


Connector & terminal

(E57) No. 5 — Engine ground:

(E57) No. 6 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 17.](#)

No

Repair the short circuit to ground in harness between ECM and electronic throttle control connector.

17. CHECK ELECTRONIC THROTTLE CONTROL MOTOR HARNESS.


Measure the resistance between electronic throttle control connectors.

Connector & terminal

(E57) No. 5 — (E57) No. 6:

Is the resistance 1 M Ω or more?

Yes

 [Go to 18.](#)

No

Repair the short circuit of harness between ECM and electronic throttle control connector.

18. CHECK ELECTRONIC THROTTLE CONTROL GROUND CIRCUIT.

Measure the resistance between ECM and engine ground.

Connector & terminal

(B134) No. 35 — Engine ground:

(B134) No. 47 — Engine ground:

(E159) No. 10 — Engine ground:

(E159) No. 17 — Engine ground:


(E159) No. 18 — Engine ground:

(E159) No. 25 — Engine ground:

(E159) No. 26 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 19.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM and engine ground**
- **Poor contact of coupling connector**

19. CHECK ELECTRONIC THROTTLE CONTROL.


Measure the resistance between electronic throttle control terminals.

Terminals


No. 5 — No. 6:

Is the resistance 50 Ω or less?

Yes

 [Go to 20.](#)

No

Replace the electronic throttle control.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Throttle Body.](#)

20. CHECK ELECTRONIC THROTTLE CONTROL.




Move the throttle valve to the fully opened and fully closed positions with fingers.
Check that the valve returns to the specified position when releasing fingers.

Does the valve return to the specified position? Standard value: 3 mm (0.12 in) from fully closed position

Yes

Repair the poor contact of ECM connector.

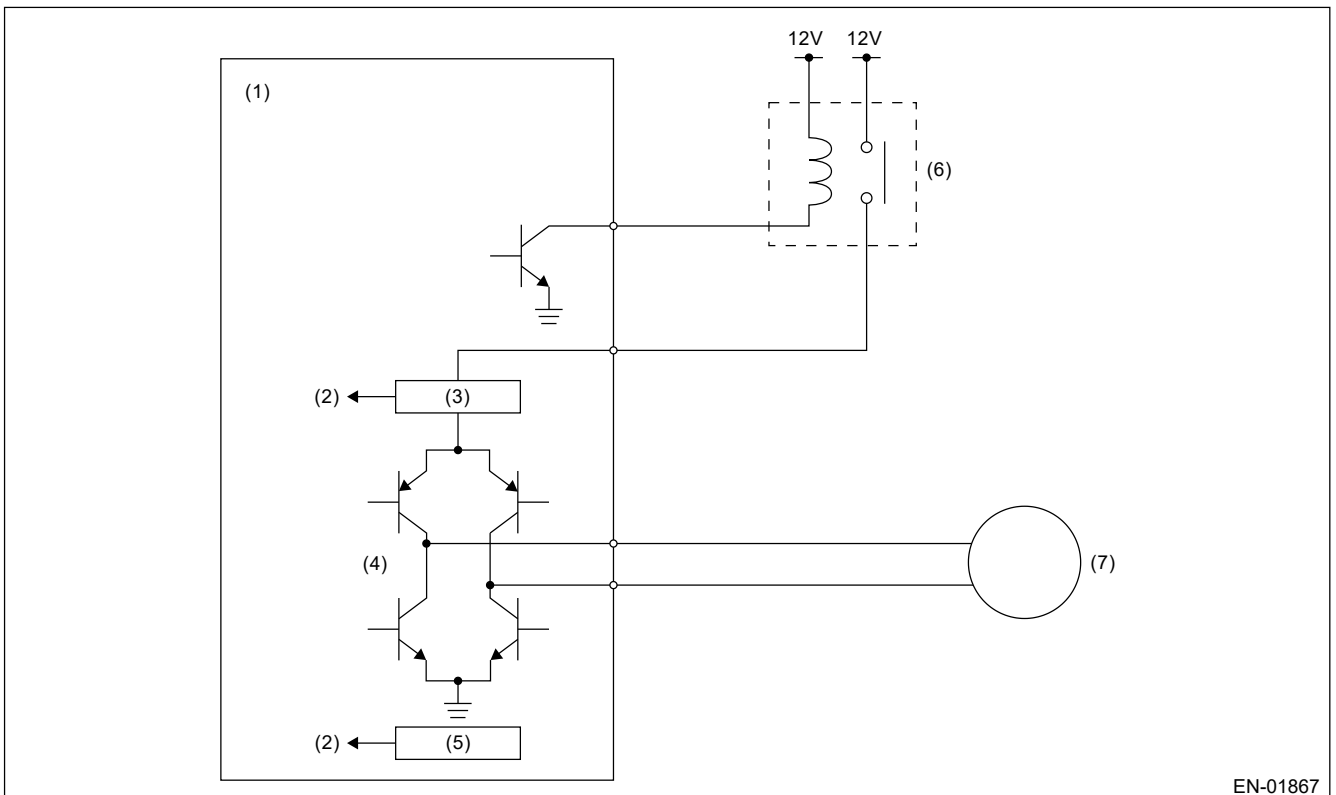
No

Replace the electronic throttle control.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Throttle Body.](#)

1. OUTLINE OF DIAGNOSIS

In the diagnosis with ignition switch ON, judge as NG when the opening angle with the throttle driven to close direction is out of the specified range.

2. COMPONENT DESCRIPTION



EN-01867

- | | | |
|-----------------------------------|-----------------------------------|---------------------------------------|
| (1) Engine control module (ECM) | (4) Drive circuit | (6) Electronic throttle control relay |
| (2) Detecting circuit | (5) Temperature detection circuit | (7) Motor |
| (3) Overcurrent detection circuit | | |

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 6\text{ V}$

4. GENERAL DRIVING CYCLE

Perform the diagnosis when the ignition switch is turned from OFF to ON.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Throttle opening angle during throttle minimum stop position learning	$\geq 36\%$

Time needed for diagnosis: 190 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2102 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT LOW



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance
- Engine stalls.

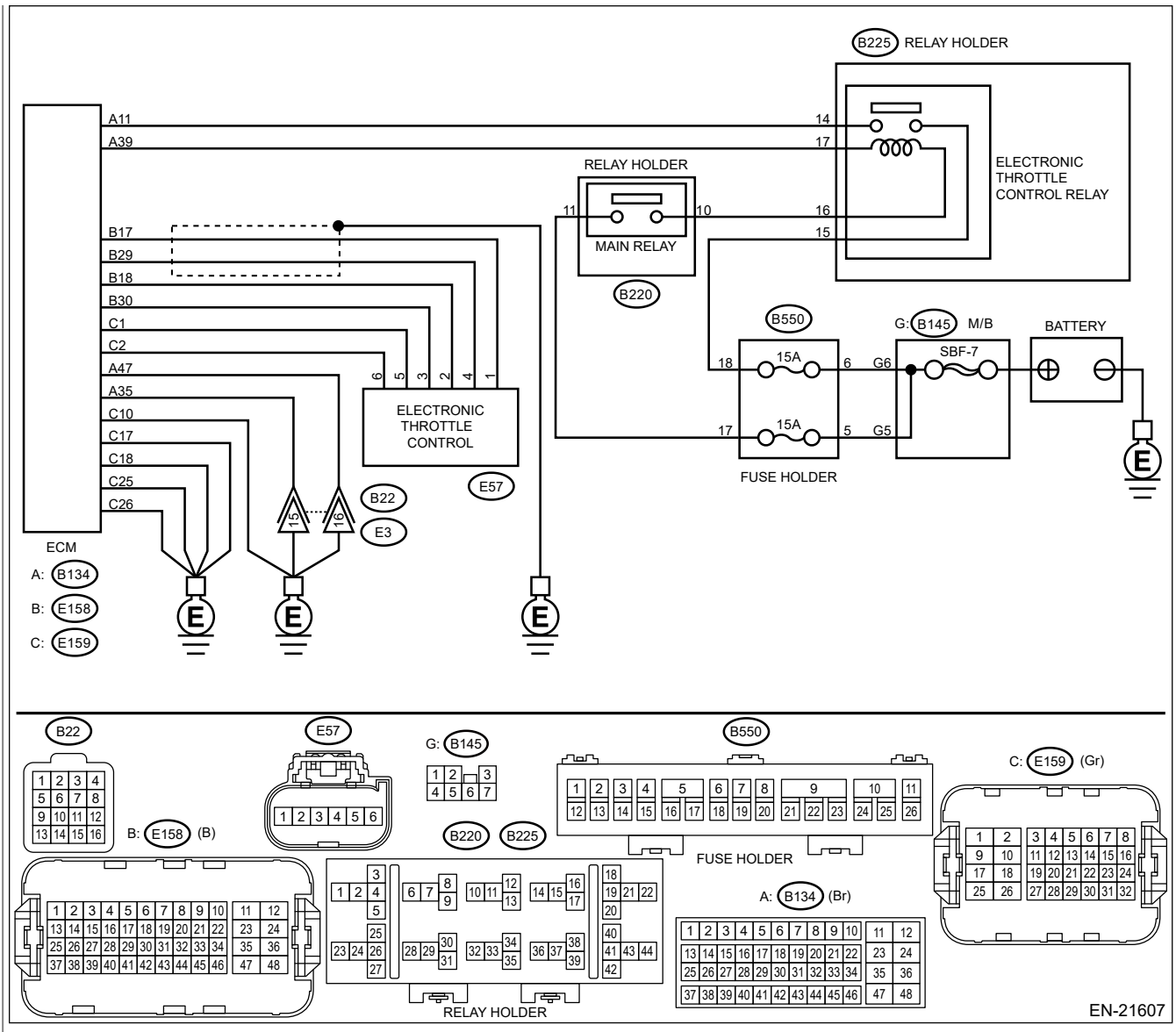
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21607

1. CHECK ELECTRONIC THROTTLE CONTROL RELAY.



1. Turn the ignition switch to OFF.
2. Remove the electronic throttle control relay.
3. Connect the battery to terminals No. 16 and No. 17 of electronic throttle control relay.
4. Measure the resistance between electronic throttle control relay terminals.

Terminals

No. 14 – No. 15:

Is the resistance less than 1 Ω?

Yes

[Go to 2.](#)

No

Replace the electronic throttle control relay. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Electronic Throttle Control Relay.](#)

2. CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY.



Measure the voltage between electronic throttle control relay connector and chassis ground.

Connector & terminal

(B225) No. 15 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 3.](#)

No

Repair the open or short to ground in the power supply circuit.

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY CONNECTOR.



1. Disconnect the connector from ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between electronic throttle control relay connector and chassis ground.

Connector & terminal


(B225) No. 17 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power in the harness between ECM and electronic throttle control relay connector.

No

 [Go to 4.](#)

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY CONNECTOR.



1. Turn the ignition switch to OFF.
2. Measure the resistance between electronic throttle control relay connector and chassis ground.


Connector & terminal

(B225) No. 14 — Chassis ground:

(B225) No. 17 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit in harness to ground between ECM and electronic throttle control relay connector.

5. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY CONNECTOR.

Measure the resistance between ECM and electronic throttle control relay connector.

Connector & terminal

(B135) No. 39 – (B225) No. 17:

(B135) No. 11 – (B225) No. 14:

Is the resistance less than 1 Ω ?

Yes

Repair the poor contact of ECM connector.

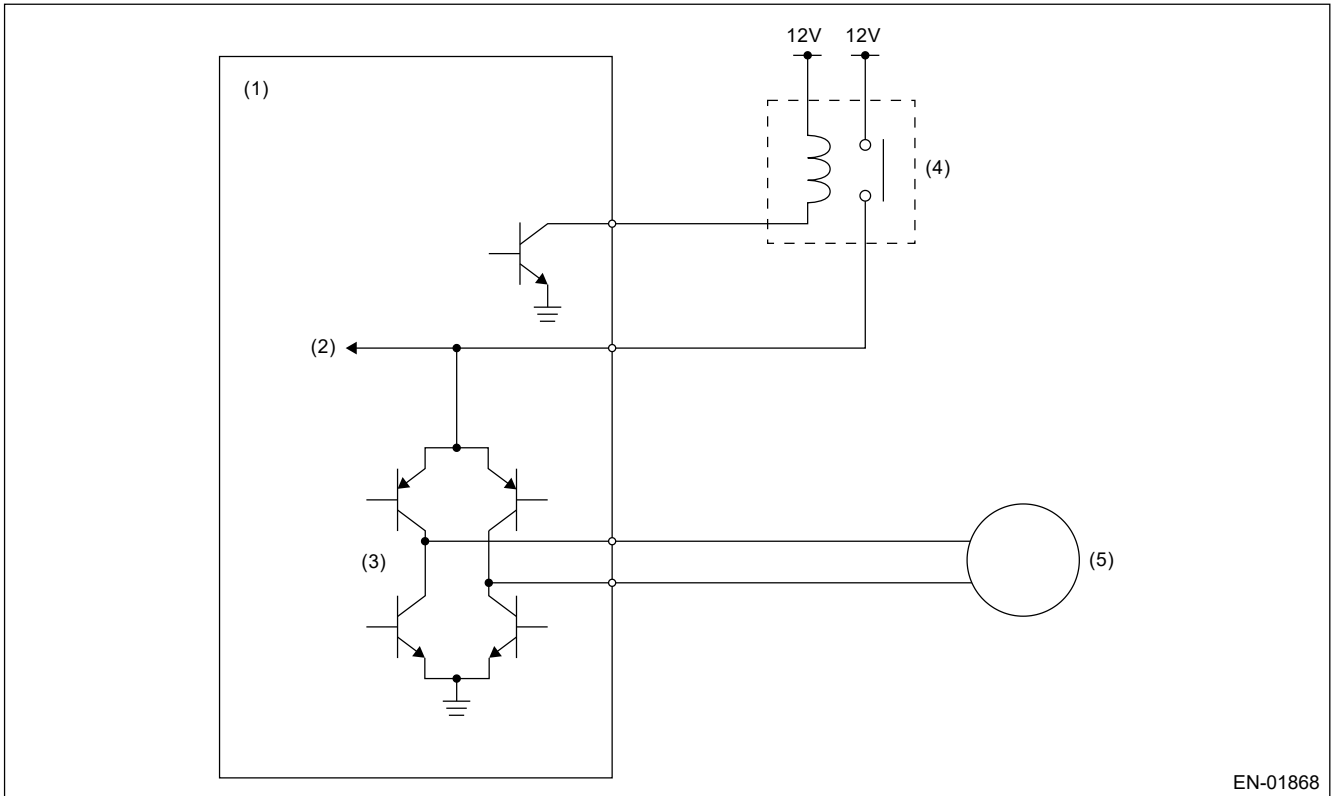
No

Repair the open circuit in harness between ECM and electronic throttle control relay connector.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the electronic throttle control power is not supplied even when ECM sets the electric control throttle relay to ON, or when the monitored electronic throttle control relay does not switch to OFF even when ECM sets the electronic throttle control relay to OFF.

2. COMPONENT DESCRIPTION



EN-01868

- (1) Engine control module (ECM) (3) Drive circuit (5) Motor
 (2) Voltage detection circuit (4) Electronic throttle control relay

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
<For electronic throttle control power supply> Battery voltage	$\geq 6 \text{ V}$
Electronic throttle control relay output	ON
<For electronic throttle control relay monitor> Battery voltage	$\geq 10.9 \text{ V}$
Electronic throttle control relay output	OFF

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
<For electronic throttle control power supply> Electronic throttle control power voltage	< 6 V
<For electronic throttle control relay monitor> Electronic throttle control relay monitor voltage	≤ 1.5 V

Time needed for diagnosis: 510 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2103 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT HIGH

DTC detecting condition:

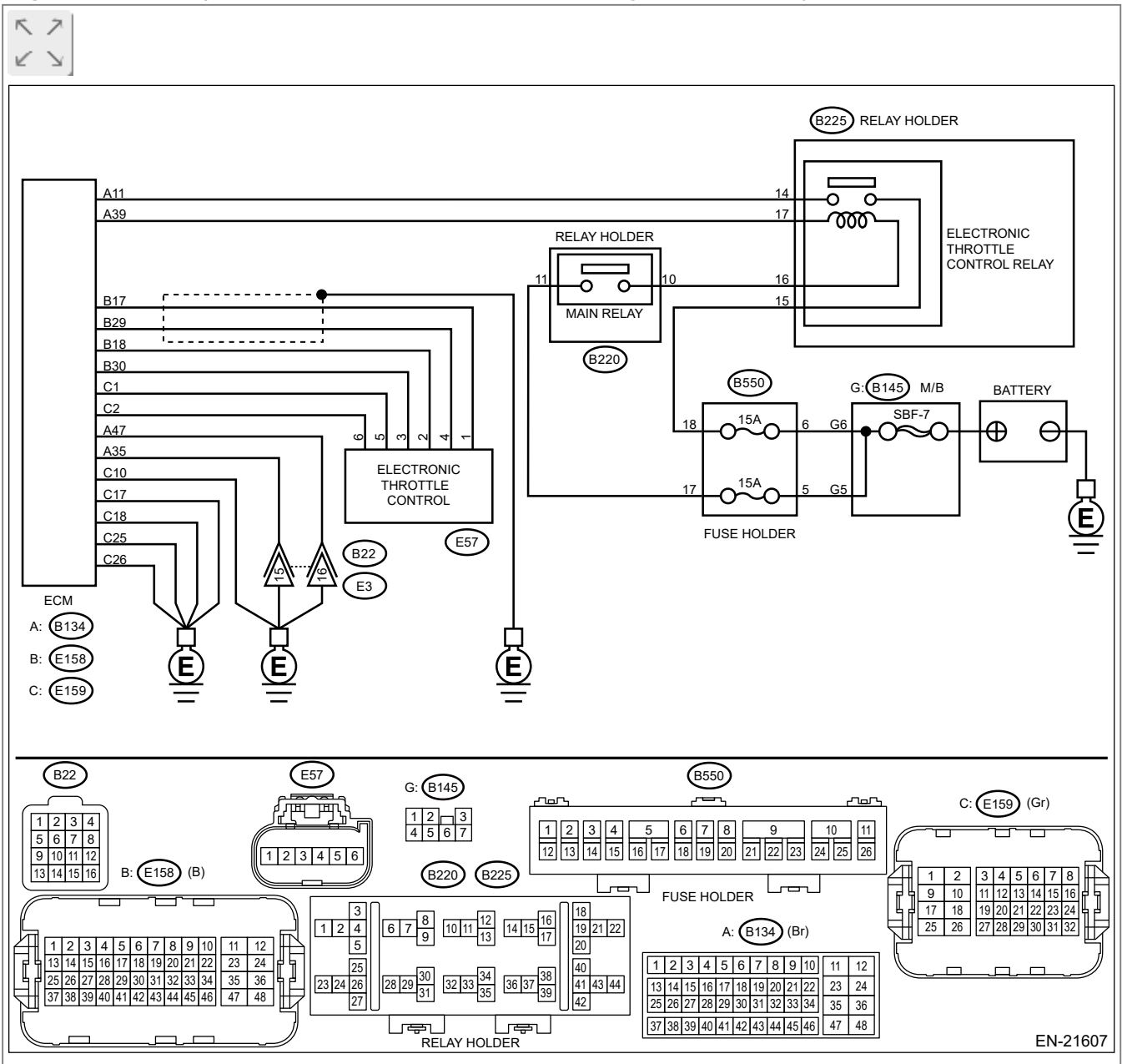
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal. voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK ELECTRONIC THROTTLE CONTROL RELAY.

1. Turn the ignition switch to OFF.
2. Remove the electronic throttle control relay.
3. Measure the resistance between electronic throttle control relay terminals.

Terminals


No. 14 — No. 15:

Is the resistance 1 MΩ or more?

Yes

 [Go to 2.](#)

No

Replace the electronic throttle control relay.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Electronic Throttle Control Relay.](#)

2. CHECK SHORT CIRCUIT OF ELECTRONIC THROTTLE CONTROL RELAY POWER SUPPLY.

1. Turn the ignition switch to ON.
2. Measure the voltage between electronic throttle control relay connector and chassis ground.

Connector & terminal

(B225) No. 14 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Repair the short circuit to power in the harness between ECM and electronic throttle control relay connector.

No

 [Go to 3.](#)

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM and engine ground.

Connector & terminal

(B134) No. 39 — Engine ground:

Is the resistance 1 MΩ or more?

 Repair the poor contact of ECM connector.

Yes

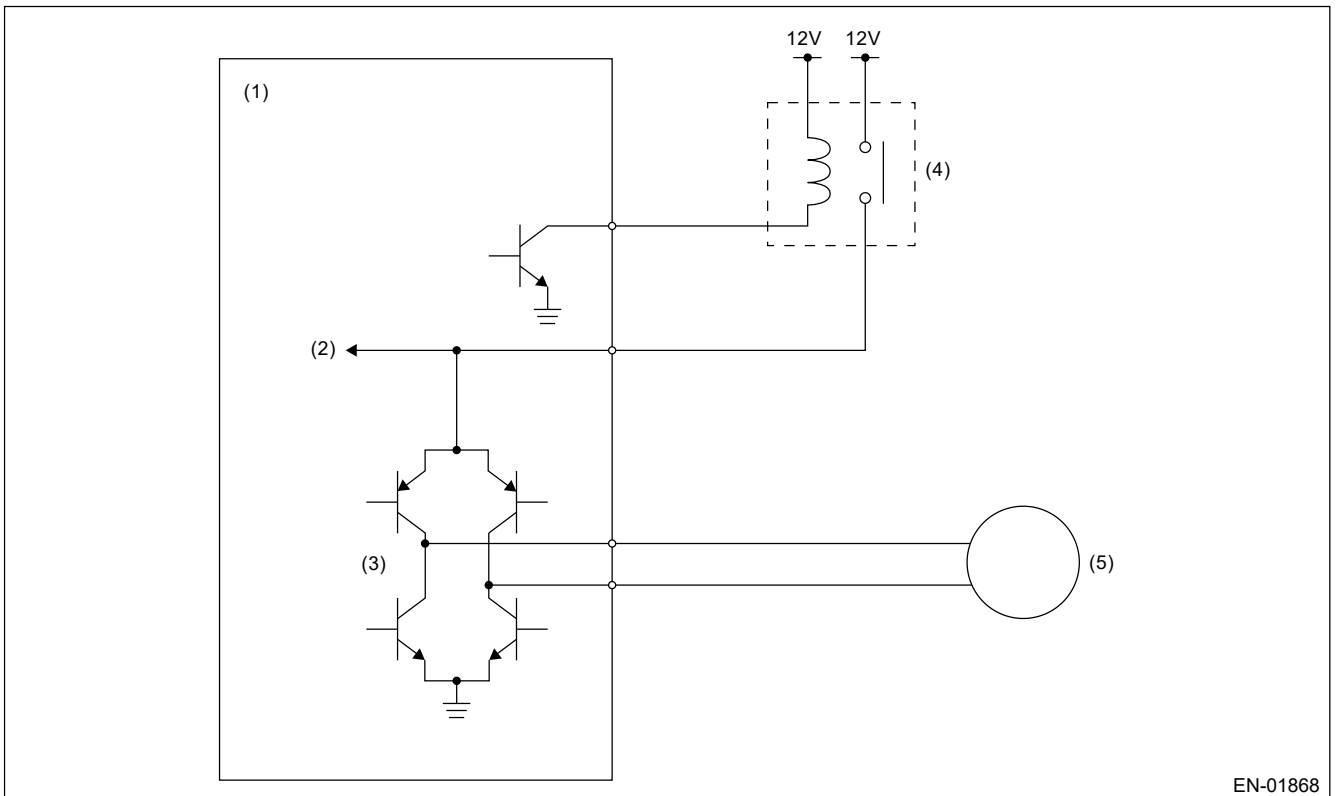
No

Repair the short circuit in harness to ground between ECM and electronic throttle control relay connector.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the monitored electronic throttle control relay does not switch to ON even when ECM sets the electric control throttle relay to ON.

2. COMPONENT DESCRIPTION



(1) Engine control module (ECM)

(3) Drive circuit

(5) Motor

(2) Voltage detection circuit

(4) Electronic throttle control relay

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Electronic throttle control relay output	ON

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Electronic throttle control relay monitor voltage	$\geq 6 \text{ V}$


Time needed for diagnosis: 510 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2109 THROTTLE/PEDAL POSITION SENSOR "A" MINIMUM STOP PERFORMANCE

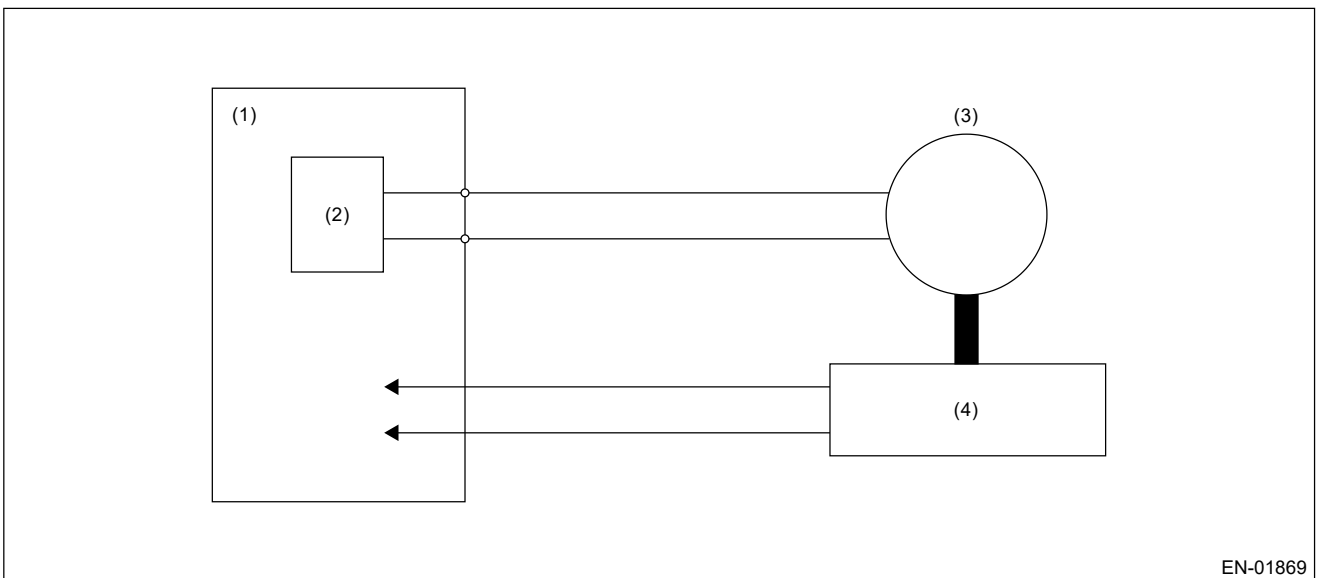
Note:

For the diagnostic procedure, refer to DTC P2101.  Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2101 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE.

1. OUTLINE OF DIAGNOSIS

Judge as NG when full close point learning cannot be conducted or an abnormal value is detected.

2. COMPONENT DESCRIPTION



- (1) Engine control module (ECM)
- (2) Drive circuit
- (3) Motor
- (4) Throttle position sensor

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Perform the diagnosis at full closed point learning.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value

Throttle opening angle when the ignition switch is ON –	< 2.6% (sensor 1)
Throttle minimum stop position	< 2.6% (sensor 2)


Time needed for diagnosis: 200 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2119 THROTTLE ACTUATOR "A" CONTROL THROTTLE BODY RANGE/PERFORMANCE

Note:

For the diagnostic procedure, refer to DTC P2101.  Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2101 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the throttle is open stuck, or when the difference between actual throttle opening angle and estimated opening angle is out of range. Judge as NG when any one of the six items for diagnosis is applied.

Throttle open stuck:

- Throttle opening angle is out of range
- Intake air amount is out of range

When the difference between actual throttle opening angle and estimated opening angle is out of range:

- All time monitoring
- Actual opening angle change amount is small
- Actual opening angle change amount is large
- Actual opening angle does not change

2. EXECUTION CONDITION

Item	Secondary Parameters	Execution condition
Throttle opening angle is out of range	Battery voltage Micro-computer (CPU failure) (P0606)	≥ 6 V Under detection
Intake air amount is out of range		
All time monitoring	Battery voltage	≥ 6 V
Actual opening angle change amount is small	Battery voltage Actual opening angle change amount	≥ 6 V > 0.84%/ms
Actual opening angle change amount is large	Battery voltage Actual opening angle change amount	≥ 6 V > 2.1%/ms
Actual opening angle does not change	Battery voltage Continuous time when actual opening angle changing	> 6 V ≥ 5 s

	amount is 0%/ms	
--	--------------------	--

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

Judge as NG if the criteria below are met.

Judgment value

Item	Malfunction Criteria	Threshold Value
Throttle opening angle is out of range	Throttle valve opening angle	$\geq 17.3\%$
Intake air amount is out of range	Intake air amount	$> 19.2 \text{ g/s}$ (0.68 oz/s)
All time monitoring	Difference between actual throttle opening angle and estimated opening angle	$\geq 4.2\%$
Actual opening angle change amount is small	Difference between actual throttle opening angle and estimated opening angle	$\geq 2.1\%$
Actual opening angle change amount is large	Difference between actual throttle opening angle and estimated opening angle	$\geq 4.2\%$
Actual opening angle does not change	Difference between actual throttle opening angle and target throttle opening angle	$\geq 1.68\%$

Time needed for diagnosis:

Item	Time
Throttle opening angle is out of range	200 ms
Intake air amount is out of range	200 ms
All time monitoring	2000 ms

Actual opening angle change amount is small	1000 ms
Actual opening angle change amount is large	500 ms
Actual opening angle does not change	1000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT LOW



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

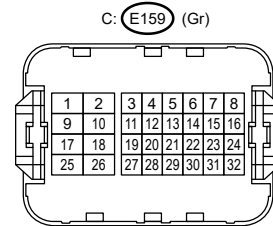
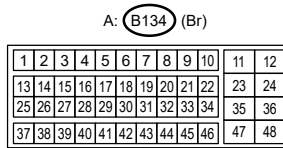
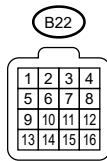
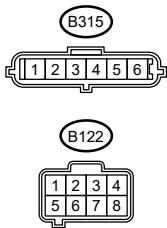
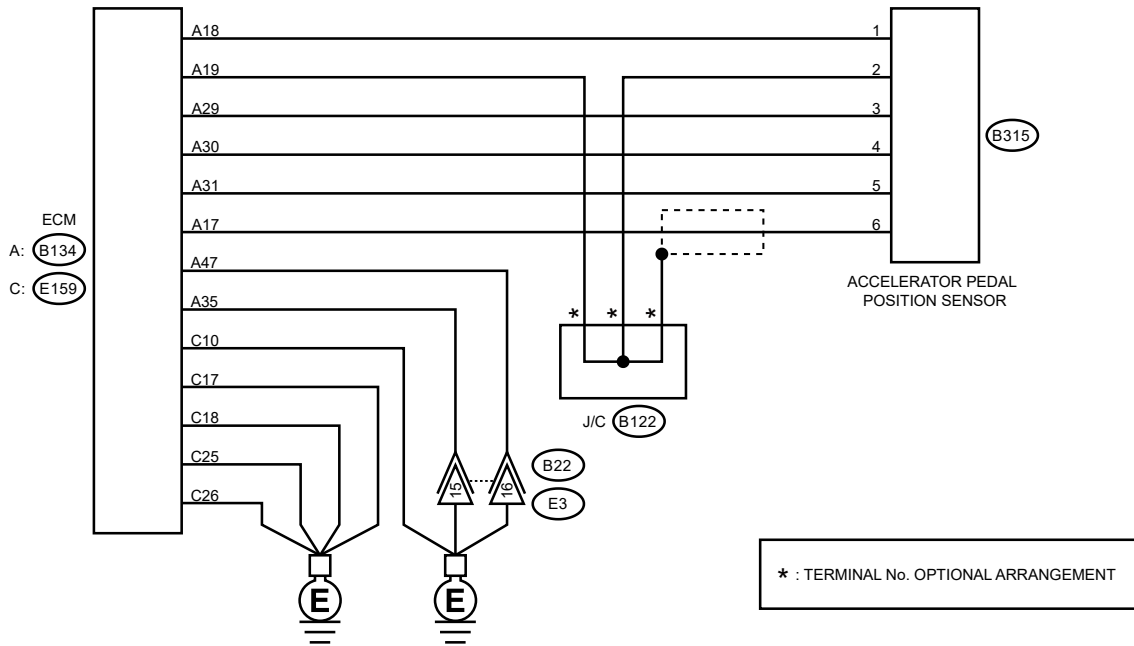
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21242

1. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the accelerator pedal position sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM and engine ground.

Connector & terminal

- (B134) No. 30 — Engine ground:
- (B134) No. 17 — Engine ground:
- (B134) No. 17 — (B134) No. 19:

Is the resistance 1 MΩ or more?

Yes

Go to 2.

No

Repair the short circuit to ground in harness between ECM and accelerator pedal position sensor connector.

2. CHECK SHORT CIRCUIT INSIDE THE ECM.



1. Connect the connector to ECM.
2. Measure the resistance between accelerator pedal position sensor connector and chassis ground.

Connector & terminal

(B315) No. 6 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

Replace the accelerator pedal. [Ref. to SPEED CONTROL SYSTEMS\(H4DO\)>Accelerator Pedal.](#)

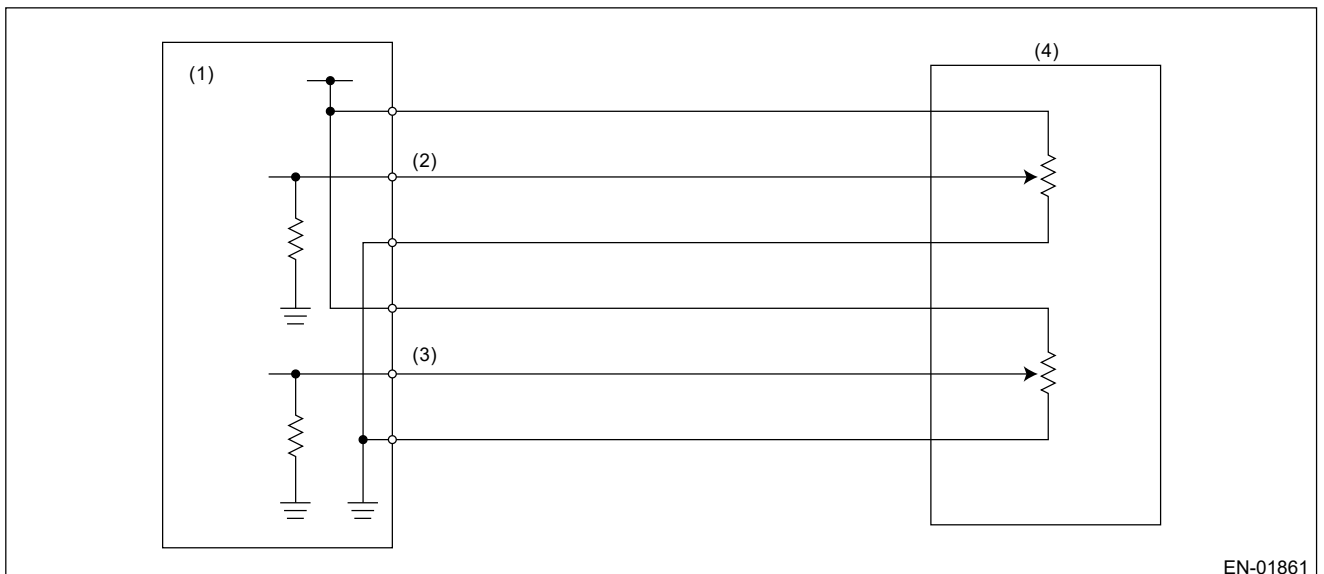
No

Repair the short circuit to ground in harness between ECM and accelerator pedal position sensor connector. Replace the ECM if defective. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of accelerator pedal position sensor 1.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-01861

(1) Engine control module (ECM)

(3) Accelerator pedal position sensor 2 signal

(4) Accelerator pedal position sensor

(2) Accelerator pedal position

sensor 1 signal

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 6 \text{ V}$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 1 input voltage	$< 0.54 \text{ V}$

Time needed for diagnosis: 100 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

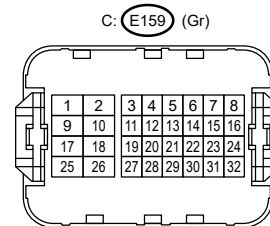
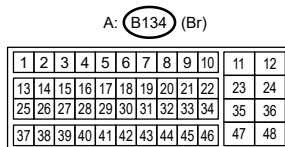
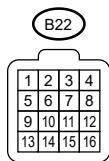
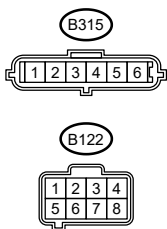
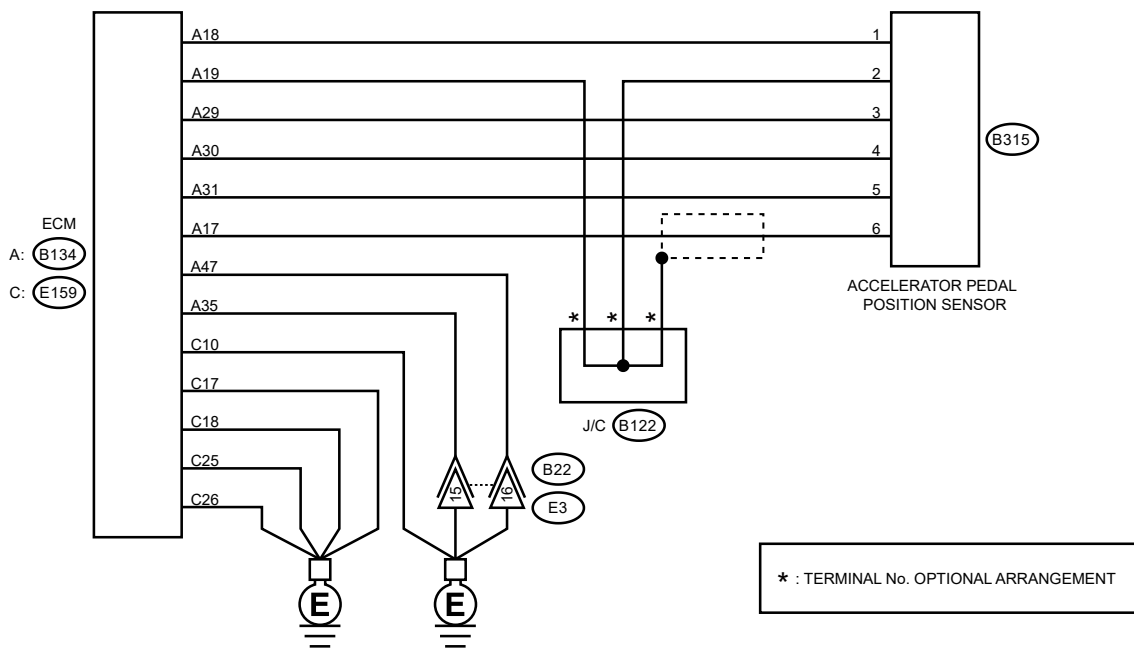
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21242

1. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the accelerator pedal position sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and accelerator pedal position sensor connector.

Connector & terminal

(B134) No. 17 — (B315) No. 6:

(B134) No. 31 — (B315) No. 5:

Is the resistance less than 1 Ω?

Yes

Go to 2.

No

Repair the open circuit in harness between ECM and accelerator pedal position sensor connector.

2. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.

1. Connect the connector to ECM.
2. Measure the resistance between accelerator pedal position sensor connector and chassis ground.

Connector & terminal

(B315) No. 5 — Chassis ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM and engine ground**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.

1. Turn the ignition switch to ON.
2. Measure the voltage between accelerator pedal position sensor connector and chassis ground.

Connector & terminal


(B315) No. 6 (+) — Chassis ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power supply in the harness between the ECM and accelerator pedal position sensor connector.

No

 [Go to 4.](#)

4. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.

Connector & terminal

(B134) No. 17 — (B134) No. 30:

Is the resistance 1 MΩ or more?

Yes

Repair the poor contact of accelerator pedal position sensor connector. Replace the accelerator pedal if defective.  [Ref. to SPEED CONTROL SYSTEMS\(H4DO\)>Accelerator Pedal.](#)

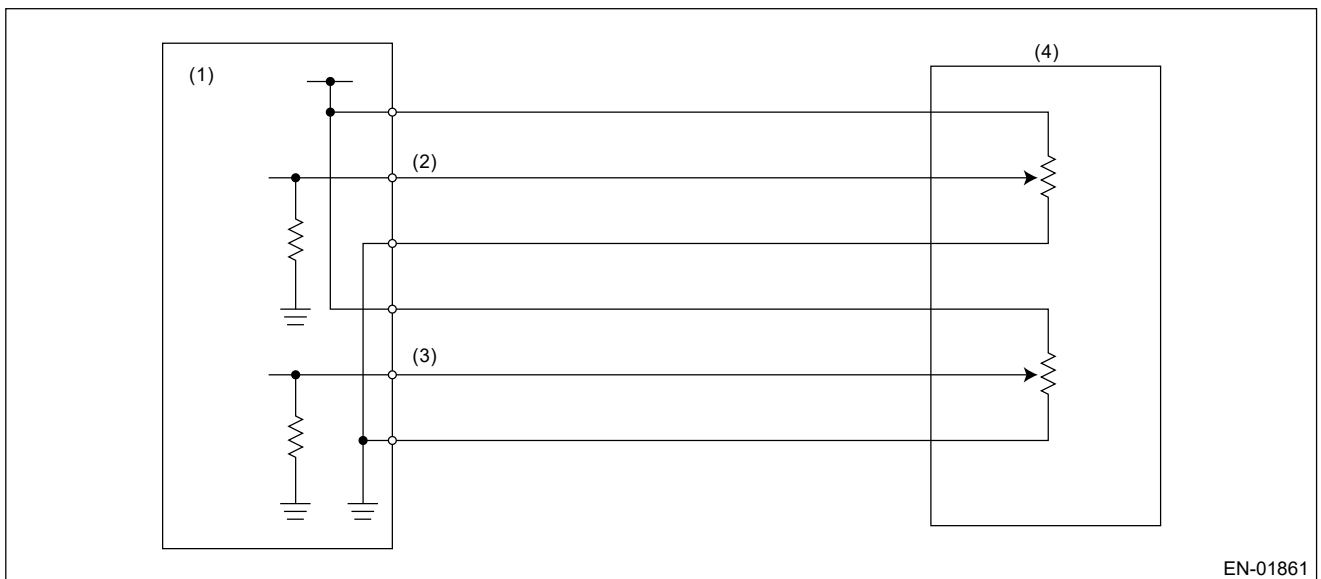
No

Repair the short circuit to power supply in the harness between the ECM and accelerator pedal position sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of accelerator pedal position sensor 1.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-01861

- (1) Engine control module (ECM) (2) Accelerator pedal position sensor 1 signal
- (3) Accelerator pedal position sensor 2 signal (4) Accelerator pedal position sensor

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 6 V

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 1 input voltage	> 4.77 V

Time needed for diagnosis: 100 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2127 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

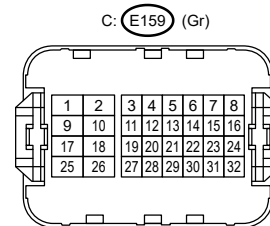
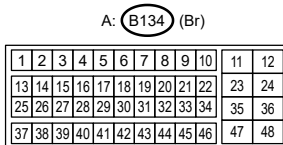
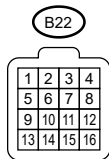
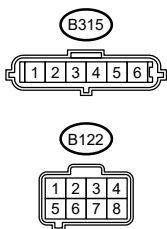
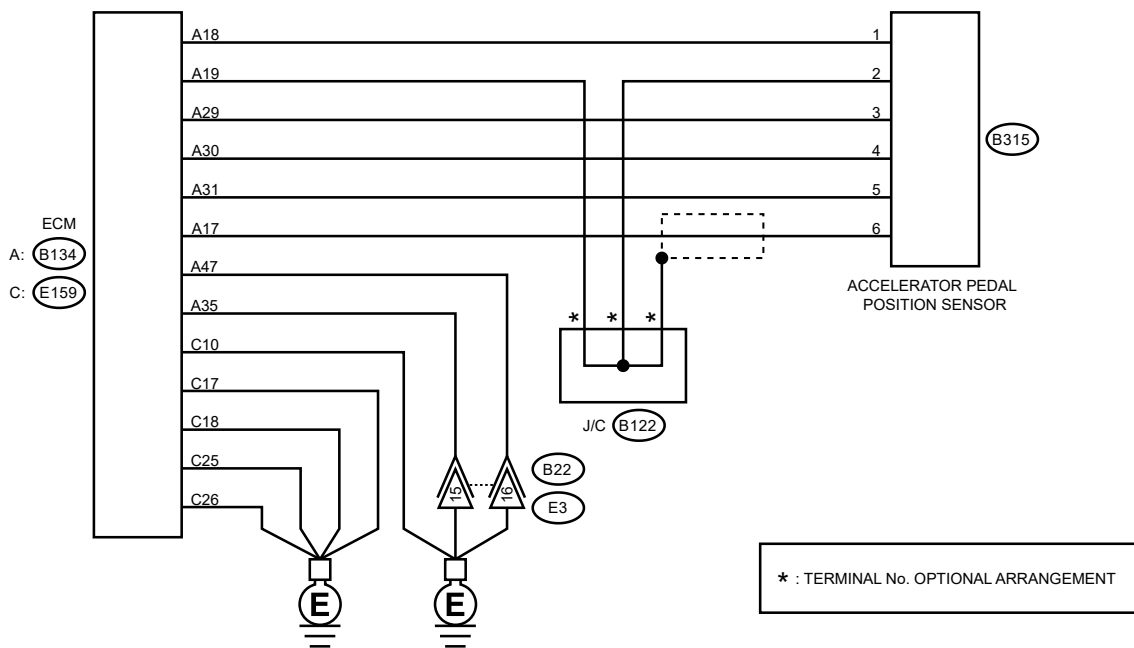
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21242

1. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the accelerator pedal position sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM and engine ground.

Connector & terminal

- (B134) No. 18 — Engine ground:
- (B134) No. 29 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

[Go to 2.](#)

No

Repair the short circuit to ground in harness between ECM and accelerator pedal position sensor connector.

2. CHECK SHORT CIRCUIT INSIDE THE ECM.



1. Connect the connector to ECM.
2. Measure the resistance between accelerator pedal position sensor connector and chassis ground.

Connector & terminal

(B315) No. 3 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

Replace the accelerator pedal. [Ref. to SPEED CONTROL SYSTEMS\(H4DO\)>Accelerator Pedal.](#)

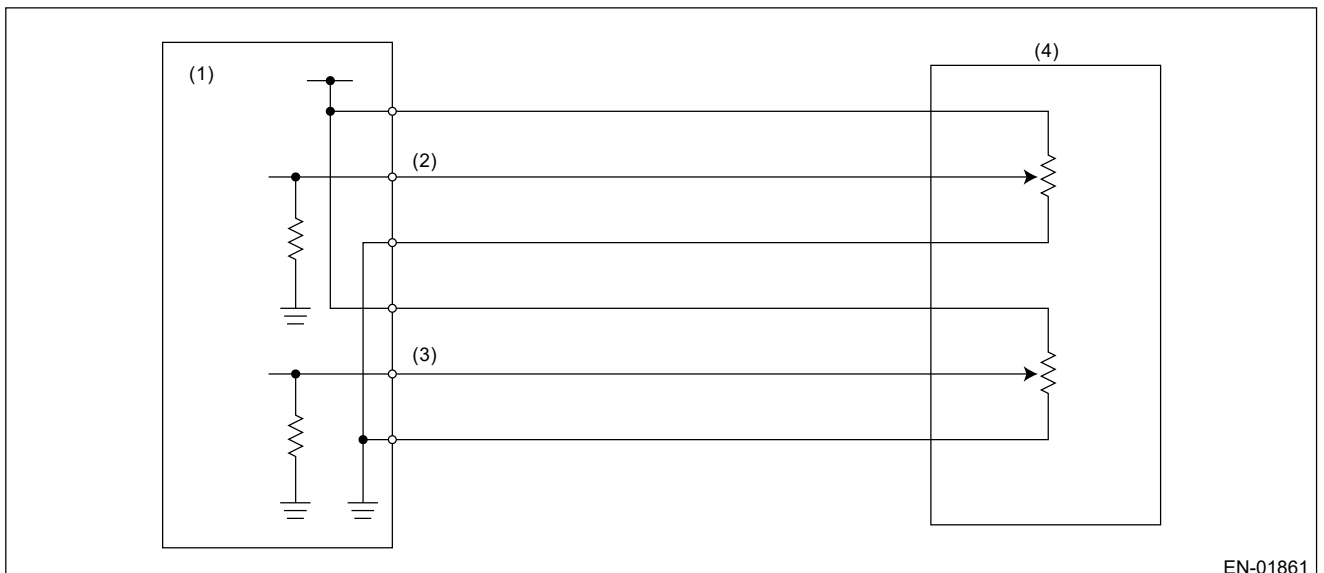
No

Repair the short circuit to ground in harness between ECM and accelerator pedal position sensor connector. Replace the ECM if defective. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of accelerator pedal position sensor 2.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



EN-01861

(1) Engine control module (ECM)

(3) Accelerator pedal position sensor 2 signal

(4) Accelerator pedal position sensor

(2) Accelerator pedal position

sensor 1 signal

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 6 \text{ V}$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 2 input voltage	$< 0.54 \text{ V}$

Time needed for diagnosis: 100 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2128 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

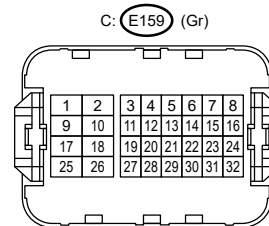
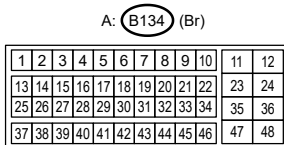
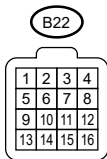
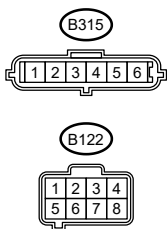
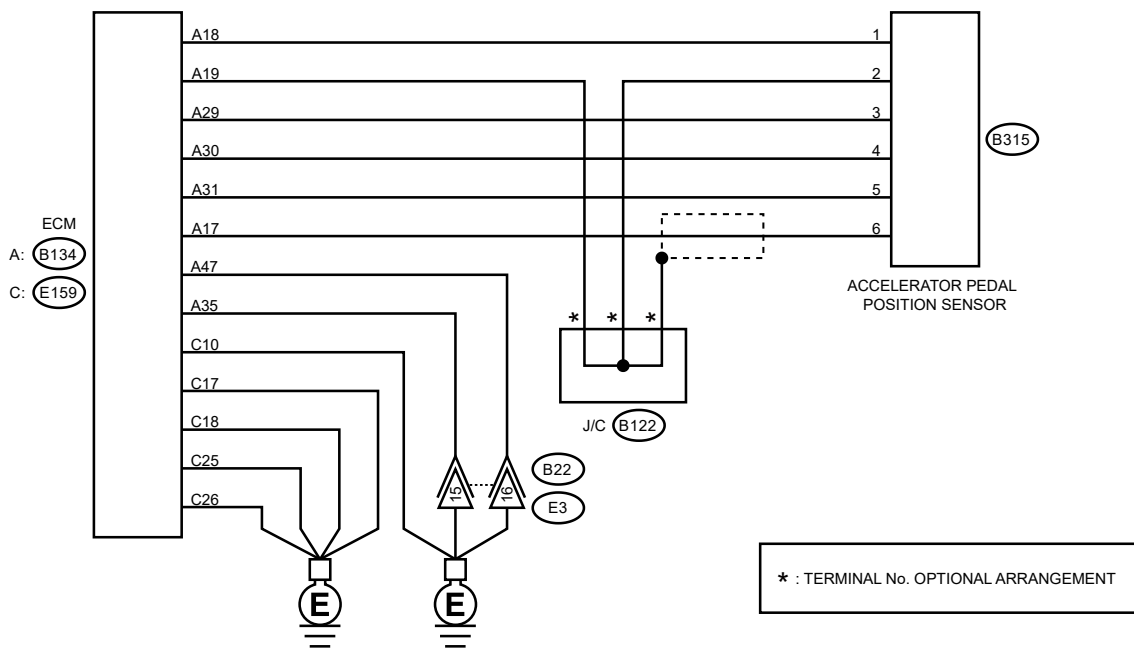
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21242

1. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the accelerator pedal position sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and accelerator pedal position sensor connector.

Connector & terminal

(B134) No. 29 — (B315) No. 3:

(B134) No. 19 — (B315) No. 2:

Is the resistance less than 1 Ω?

Yes

Go to 2.

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and accelerator pedal position sensor connector**
- **Poor contact of joint connector**

2. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.




1. Connect the connector to ECM.
2. Measure the resistance between accelerator pedal position sensor connector and chassis ground.

Connector & terminal

(B315) No. 2 — Chassis ground:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM and engine ground**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.



1. Turn the ignition switch to ON.
2. Measure the voltage between accelerator pedal position sensor connector and chassis ground.

Connector & terminal

(B315) No. 3 (+) — Chassis ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power supply in the harness between the ECM and accelerator pedal position sensor connector.

No

 [Go to 4.](#)

4. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.

Connector & terminal

(B134) No. 18 — (B134) No. 29:

Is the resistance 1 MΩ or more?

Yes

Repair the poor contact of accelerator pedal position sensor connector. Replace the accelerator pedal if defective.  [Ref. to SPEED CONTROL SYSTEMS\(H4DO\)>Accelerator Pedal.](#)

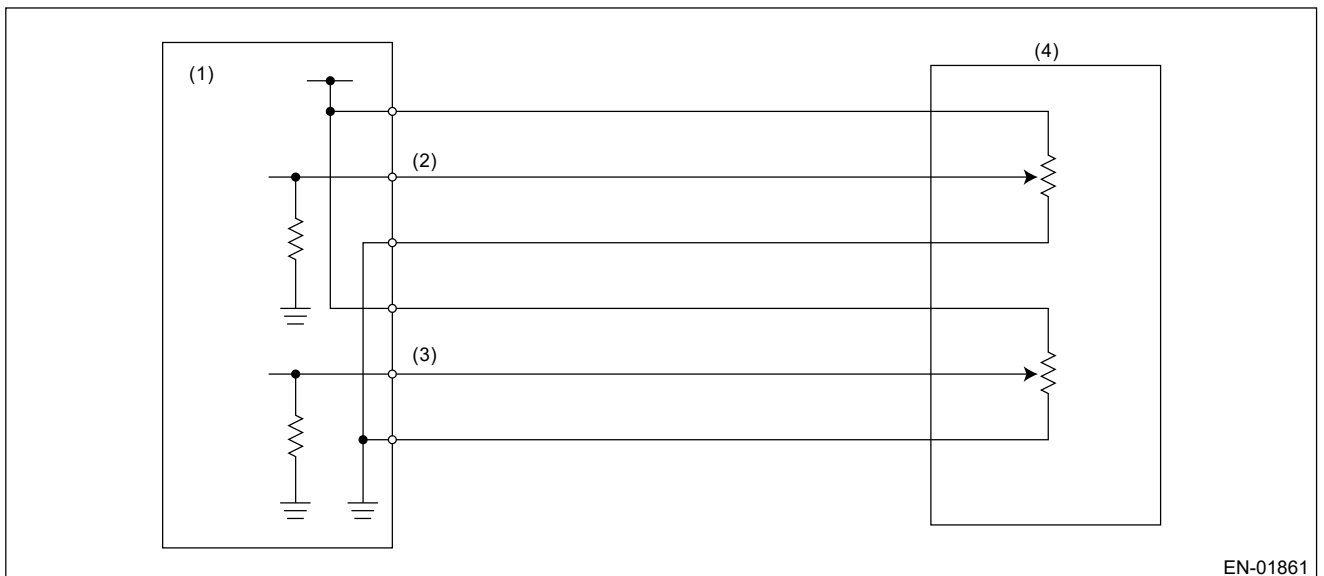
No

Repair the short circuit to power supply in the harness between the ECM and accelerator pedal position sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of accelerator pedal position sensor 2.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Engine control module (ECM)

(3) Accelerator pedal position sensor 2 signal

(4) Accelerator pedal position sensor

(2) Accelerator pedal position sensor 1 signal

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 6\text{ V}$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 2 input voltage	$> 4.77\text{ V}$

Time needed for diagnosis: 100 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2135 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE CORRELATION



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

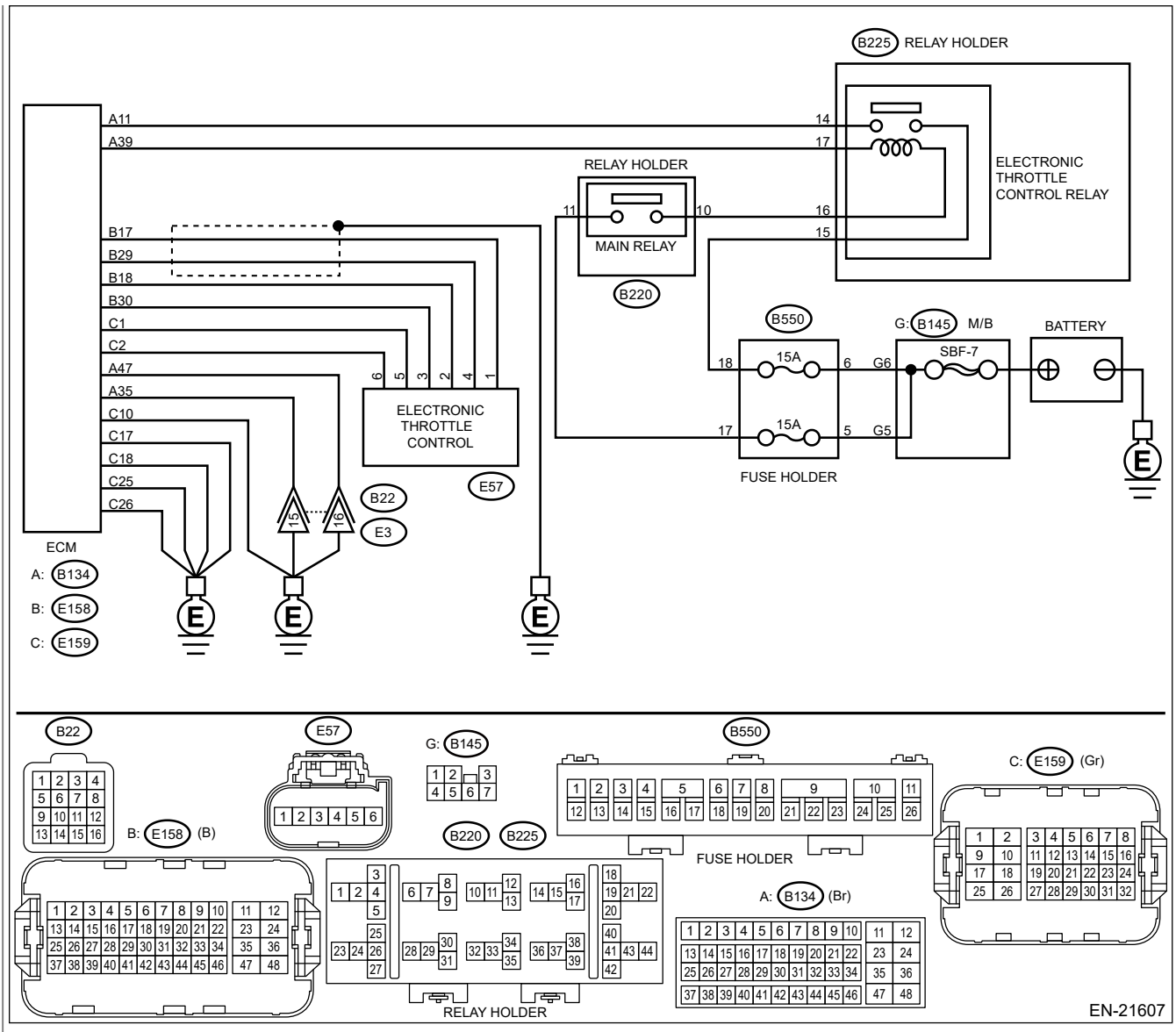
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





1. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connectors from electronic throttle control.
3. Disconnect the connector from ECM.
4. Measure the resistance between ECM and engine ground.

Connector & terminal

- (E158) No. 18 — Engine ground:
- (E158) No. 17 — Engine ground:
- (E158) No. 17 — (E158) No. 28:
- (E158) No. 29 — Engine ground:
- (E158) No. 29 — (E158) No. 28:

Is the resistance 1 MΩ or more?

Yes

 [Go to 2.](#)

No

Repair the short circuit to ground in harness between ECM and electronic throttle control connector.

2. CHECK SHORT CIRCUIT INSIDE THE ECM.

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 1 — Engine ground:


(E57) No. 4 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 3.](#)

No

Repair the short circuit to ground in harness between ECM and electronic throttle control connector. Replace the ECM if defective.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM and electronic throttle control connector.

Connector & terminal

(E158) No. 17 — (E57) No. 1:

(E158) No. 30 — (E57) No. 3:

(E158) No. 29 — (E57) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Repair the open circuit of harness between ECM and electronic throttle control connector.

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.


1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 3 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 5.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM and engine ground**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

5. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to ON.
2. Measure the voltage between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 1 (+) — Engine ground (-):

(E57) No. 4 (+) — Engine ground (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit to power in harness between ECM and electronic throttle control connector.

No

 [Go to 6.](#)

6. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.


Connector & terminal

(E158) No. 18 — (E158) No. 17:

(E158) No. 18 — (E158) No. 29:

Is the resistance 1 M Ω or more?

Yes

Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Throttle Body.](#)

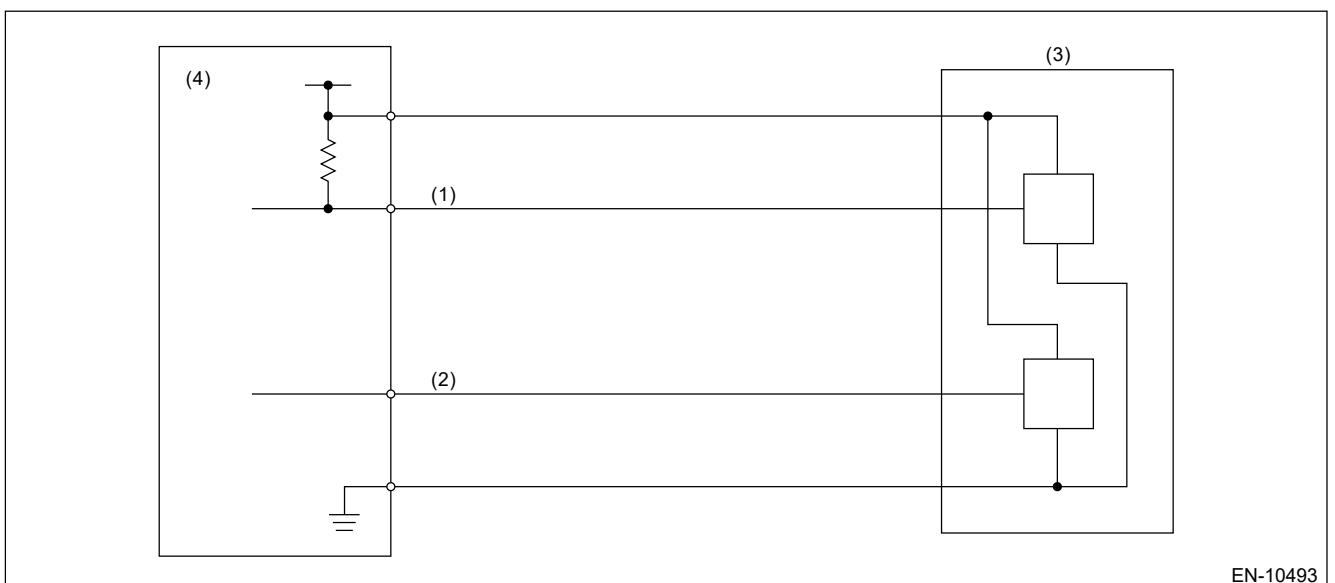
No

Repair the short circuit to power in harness between ECM and electronic throttle control connector.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the signal level of throttle position sensor 1 is different from the throttle position sensor 2.

2. COMPONENT DESCRIPTION



(1) Throttle position sensor 1 signal

(3) Throttle position sensor

(4) Engine control module (ECM)

(2) Throttle position sensor 2 signal

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 6 \text{ V}$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

--

Malfunction Criteria	Threshold Value
Throttle position sensor 1 voltage – (5 V – throttle position sensor 2 voltage)	> 0.79 V

Time needed for diagnosis: 120 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2138 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE CORRELATION



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

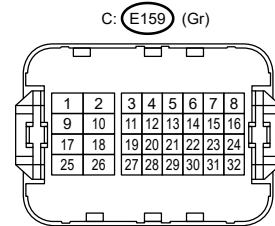
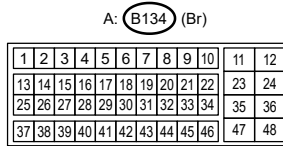
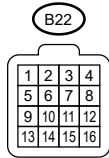
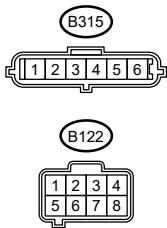
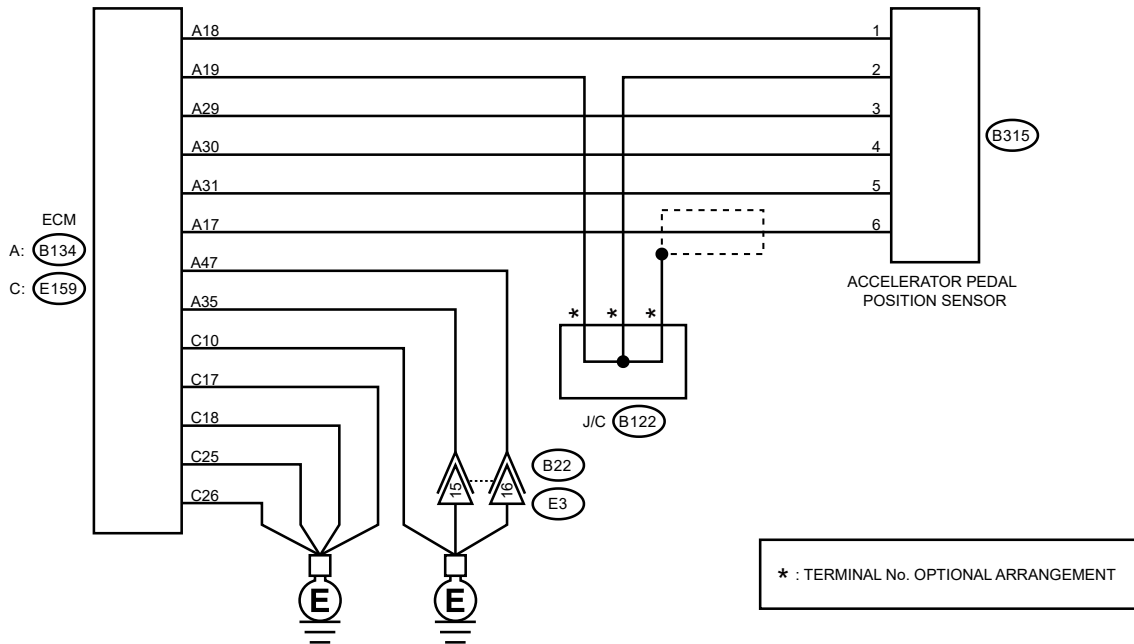
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-21242

1. CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.



1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and engine ground.

Connector & terminal

Main accelerator pedal position sensor signal

(B134) No. 17 (+) — Engine ground (—):

Sub accelerator pedal position sensor signal


(B134) No. 29 (+) — Engine ground (—):

Is the difference in measured values for the main accelerator pedal position sensor signal and the sub accelerator pedal position sensor signal 0 V?

Yes

[Go to 3.](#)

No

 [Go to 2.](#)

2. CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.

1. Measure the voltage between accelerator pedal position sensor connector and chassis ground.


Connector & terminal

(B315) No. 6 (+) — Chassis ground (-):

(B315) No. 3 (+) — Chassis ground (-):

Is the difference in measured values for the main accelerator pedal position sensor signal and the sub accelerator pedal position sensor signal 0 V?

Yes

Replace the accelerator pedal.  [Ref. to SPEED CONTROL SYSTEMS\(H4DO\)>Accelerator Pedal.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and accelerator pedal position sensor connector**
- **Short circuit to ground in harness between ECM and accelerator pedal position sensor connector**

3. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR.

Measure the resistance of harness between the accelerator pedal position sensor connector and chassis ground.

Connector & terminal

(B315) No. 5 — Chassis ground:

(B315) No. 2 — Chassis ground:

Is the resistance less than 5 Ω ?

Yes

Repair the poor contact of ECM connector.

No

repair the harness and connector.

Note:

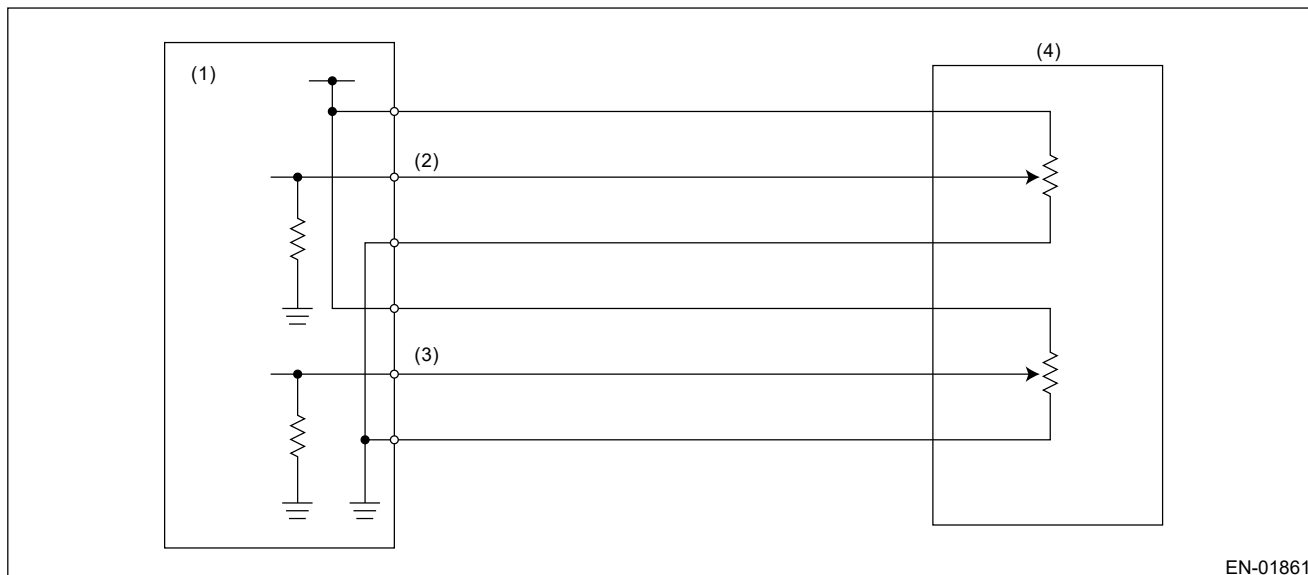
In this case, repair the following item:

- **Open circuit in harness between ECM and accelerator pedal position sensor connector**
- **Open circuit of harness between ECM and engine ground**
- **Poor contact of coupling connector**

1. OUTLINE OF DIAGNOSIS

Judge as NG when the signal level of accelerator pedal position sensor 1 is different from the accelerator pedal position sensor 2.

2. COMPONENT DESCRIPTION



EN-01861

(1) Engine control module (ECM)

(3) Accelerator pedal position sensor 2 signal

(4) Accelerator pedal position sensor

(2) Accelerator pedal position sensor 1 signal

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 6 \text{ V}$

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

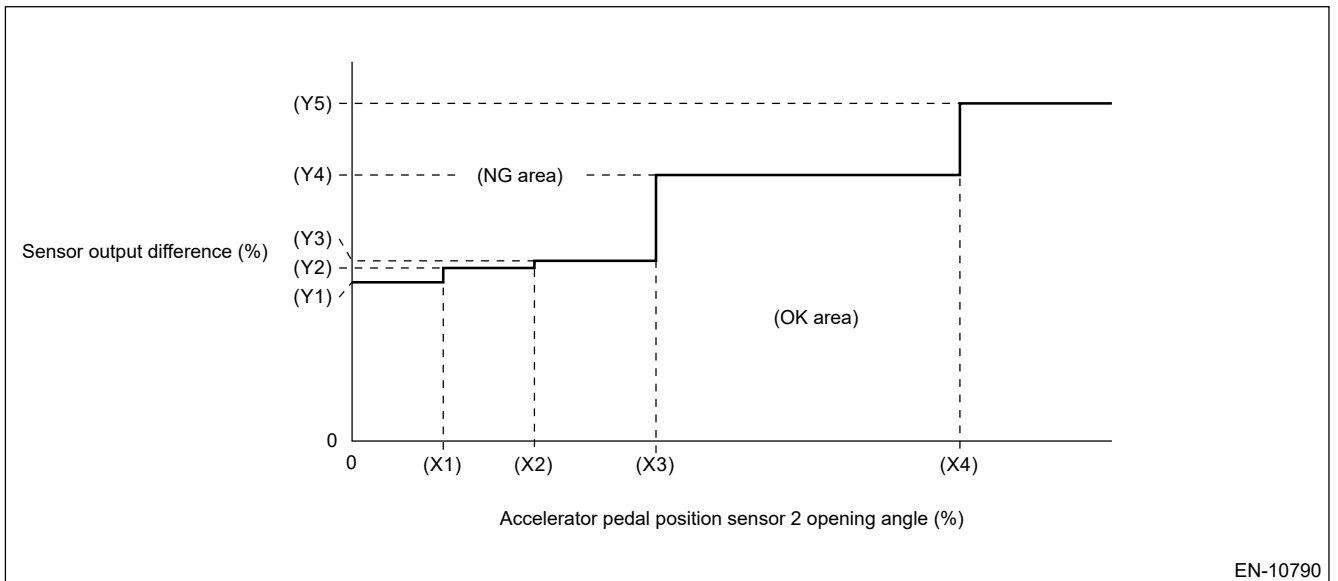
5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal difference between two sensors	Within NG range of Details of judgment value

Details of judgment value



EN-10790

- (X1) 1.82%
- (X2) 3.64%
- (X3) 6.06%
- (X4) 12.12%
- (Y1) 4.44%
- (Y2) 4.84%
- (Y3) 5.04%
- (Y4) 7.44%
- (Y5) 9.44%

Time needed for diagnosis: 140 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2146 FUEL INJECTOR GROUP "A" SUPPLY VOLTAGE CIRCUIT/OPEN

DTC detecting condition:

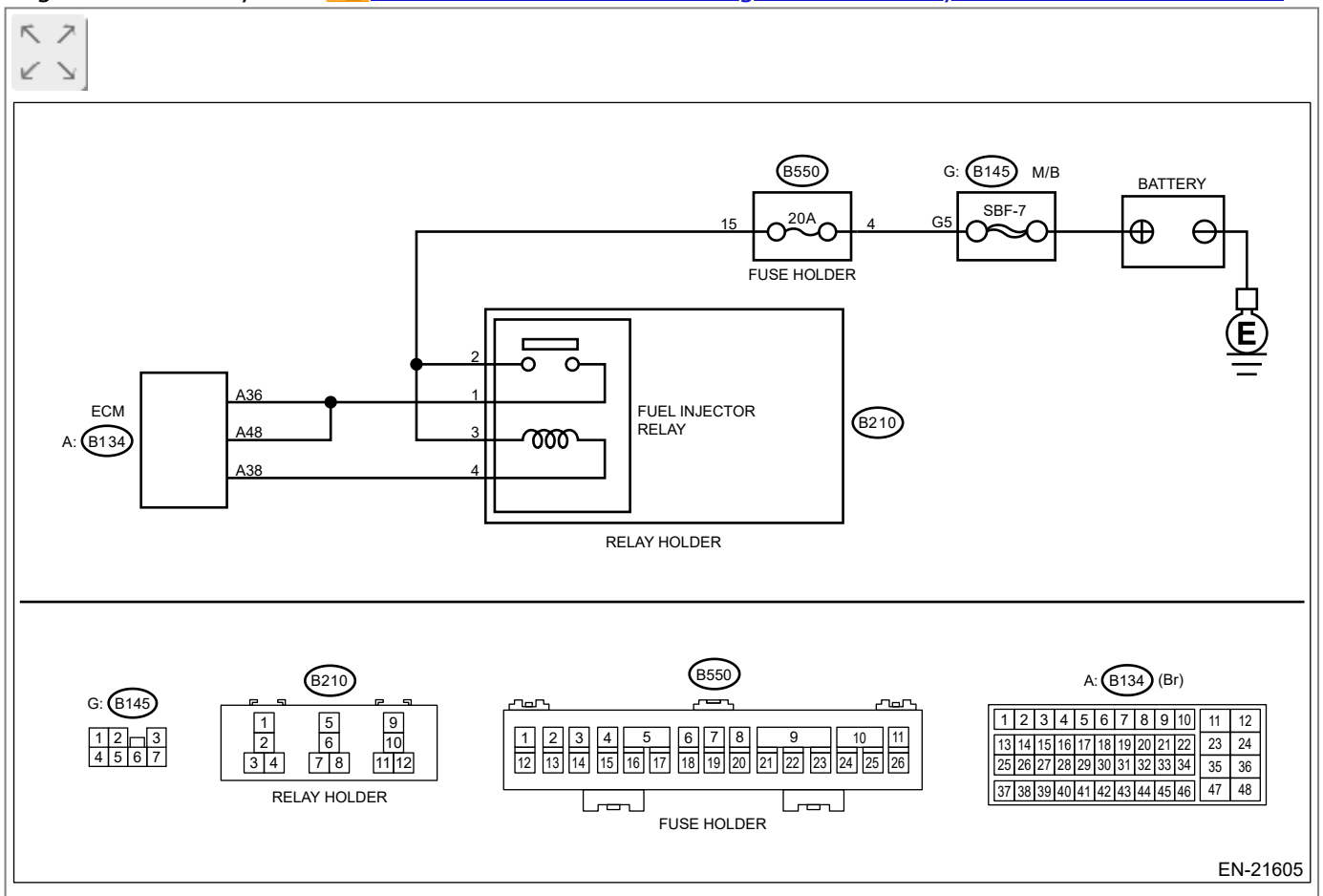
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK INPUT VOLTAGE OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and engine ground.

Connector & terminal

(B134) No. 36 (+) — Engine ground (-):

(B134) No. 48 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

Repair the poor contact of ECM connector.

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR RELAY CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Remove the fuel injector relay.
4. Measure the resistance between fuel injector relay connector and engine ground.

Connector & terminal

(B210) No. 1 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 3.](#)

No

Repair the short circuit to ground in harness between ECM and fuel injector relay connector.

3. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR RELAY CONNECTOR.

Measure the resistance of harness between ECM and fuel injector relay connector.

Connector & terminal

(B134) No. 36 — (B210) No. 1:

(B134) No. 48 — (B210) No. 1:

(B134) No. 38 — (B210) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Repair the open circuit in harness between ECM and fuel injector relay connector.

4. CHECK INPUT VOLTAGE OF FUEL INJECTOR RELAY.

Measure the voltage between fuel injector relay connector and the engine ground.


Connector & terminal

(B210) No. 2 (+) — Engine ground (–):

(B210) No. 3 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes

Replace the fuel injector relay.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Injector Relay.](#)

No

Repair the open or ground short in the harness of power supply circuit.

1. OUTLINE OF DIAGNOSIS

Detect the open/short circuit of injector power supply circuit and injector booster circuit.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Injector power supply voltage (diagnosis 2 only)	6 – 17.2 V

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Diagnosis 1

Judgment value

Malfunction Criteria	Threshold Value
Injector power supply voltage	< 6 V or > 17.2 V

Diagnosis 2

Judgment value

Malfunction Criteria	Threshold Value
Injector booster power supply voltage	< 5.98 V or > 70.72 V

Time needed for diagnosis:

- Diagnosis 1: 1000 ms
- Diagnosis 2: 280 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2195 A/F /O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 1

DTC detecting condition:

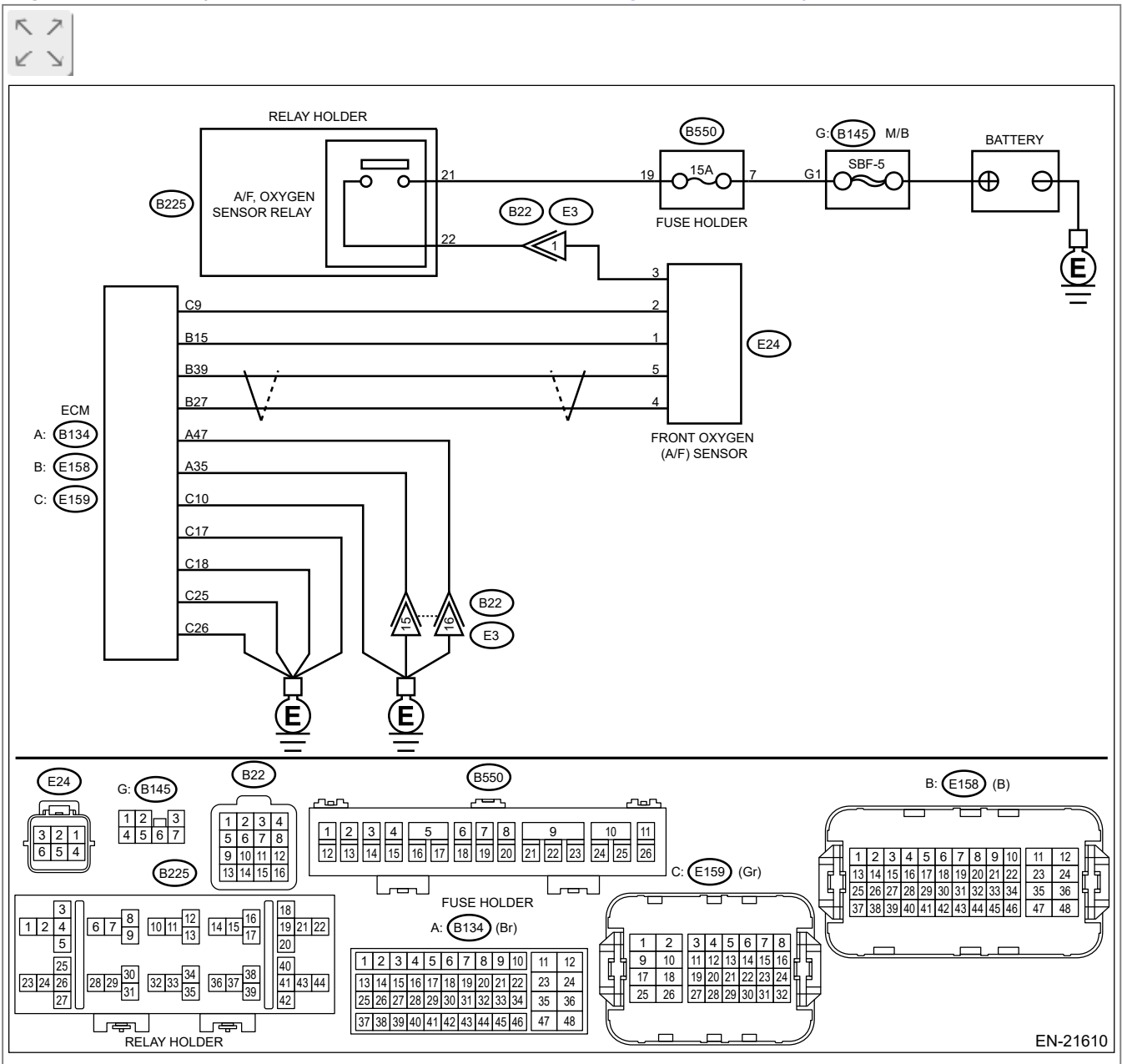
Detected when two consecutive driving cycles with fault occur.

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.



Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.

Connector & terminal

(E158) No. 15 — (E24) No. 1:

(E158) No. 27 — (E24) No. 4:

(E158) No. 39 — (E24) No. 5:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and front oxygen (A/F) sensor connector**
- **Poor contact of coupling connector**

3. CHECK FOR POOR CONTACT.



Check for poor contact of the front oxygen (A/F) sensor connector.

Is there poor contact of front oxygen (A/F) sensor connector?

Yes

Repair the poor contact of front oxygen (A/F) sensor connector.

No

Replace the front oxygen (A/F) sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Front Oxygen \(A/F\) Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect that λ value remains low.

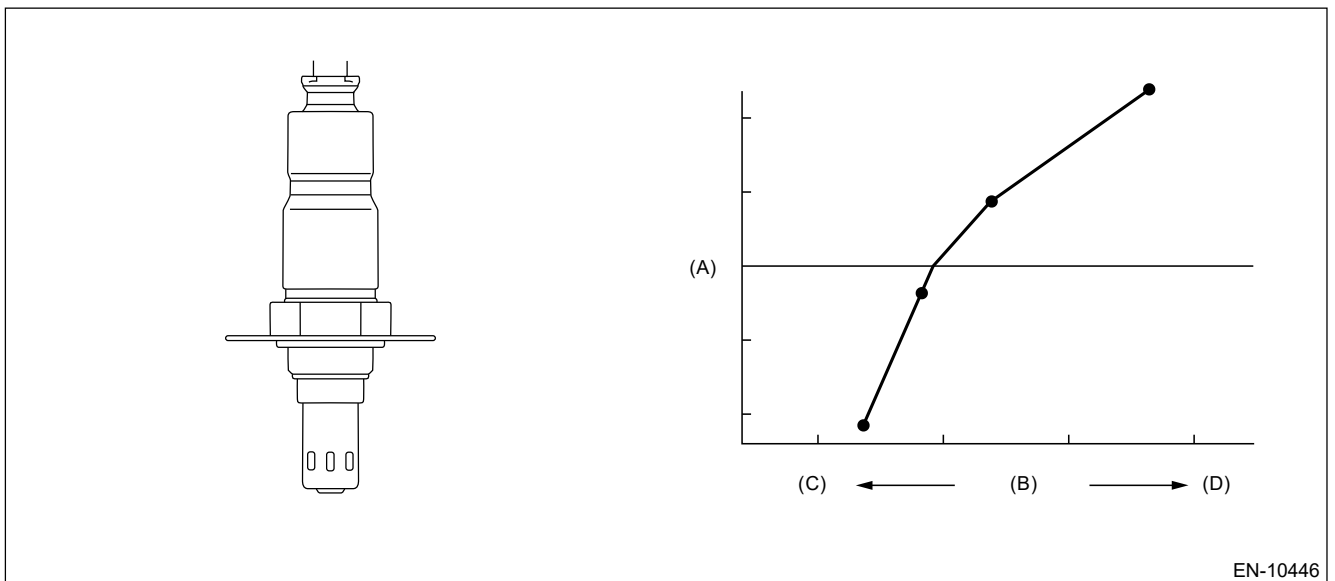
Judge as NG when lambda value is determined as abnormal in accordance with driving conditions such as intake air amount, sub feedback control, and front oxygen (A/F) sensor λ value and rear oxygen sensor voltage value.

λ value = Actual air fuel
ratio/Theoretical air fuel ratio

$\lambda > 1$: Lean

$\lambda < 1$: Rich

2. COMPONENT DESCRIPTION



(A) Electromotive force

(B) Air fuel ratio

(C) Rich

(D) Lean

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Main feedback	In operation
Amount of intake air	≥ 6 g/s (0.21 oz/s)
Estimated temperature of the rear oxygen sensor element	$\geq 450^\circ\text{C}$ (842°F)

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
λ value	> 1.15
Rear oxygen sensor voltage value	≥ 0.55 V

Time needed for diagnosis: 10000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2196 A/F /O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 1

DTC detecting condition:

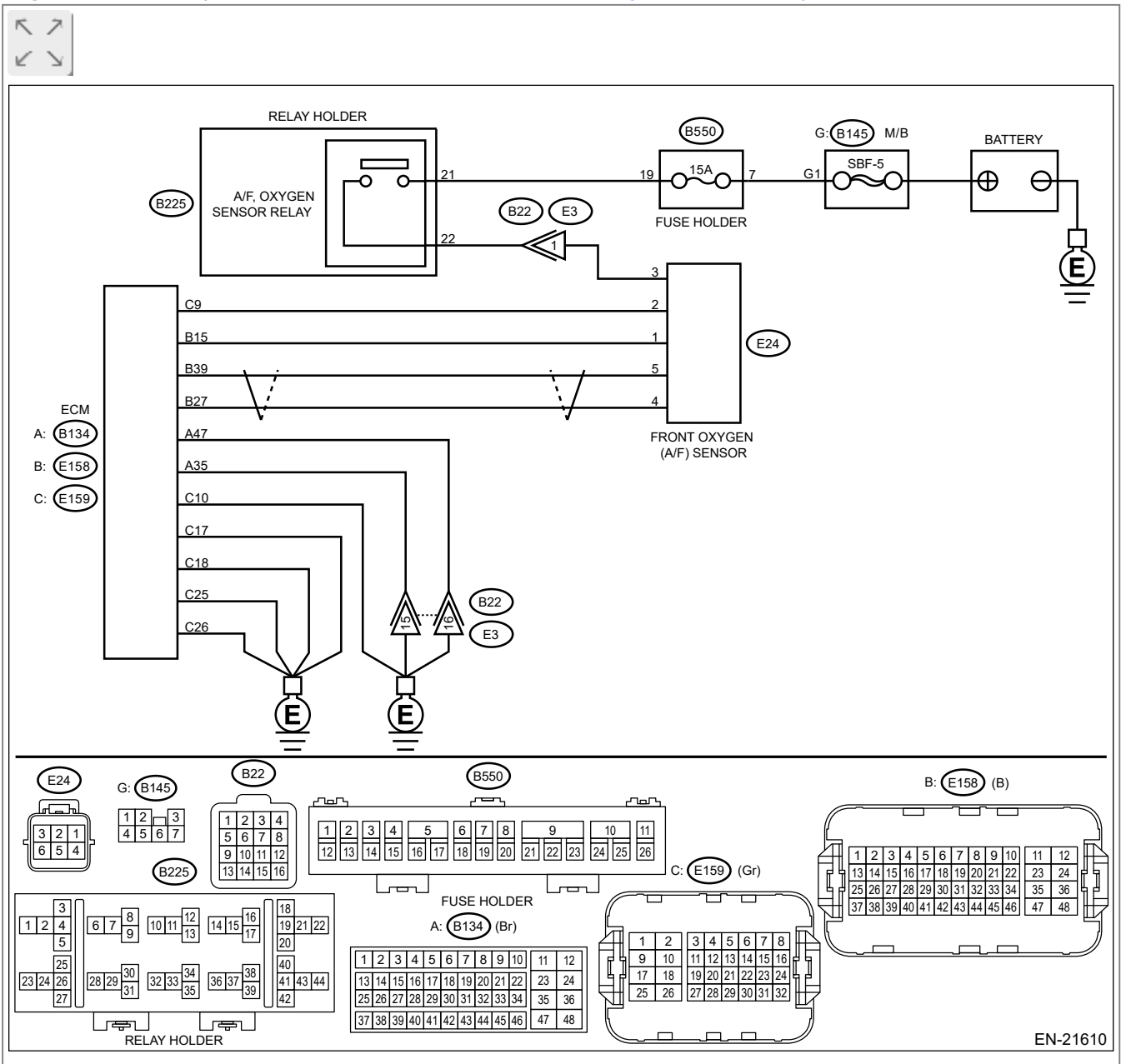
Detected when two consecutive driving cycles with fault occur.

Caution:

- After servicing or replacing faulty parts, perform Clear Memory Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.




Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM and chassis ground.

Connector & terminal

(E158) No. 15 — Chassis ground:

(E158) No. 27 — Chassis ground:

(E158) No. 39 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 3.](#)

No

Repair the ground short circuit of harness between ECM and front oxygen (A/F) sensor connector.

3. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.



1. Connect the connector to ECM.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between ECM and chassis ground.

Connector & terminal

(E158) No. 15 (+) — Chassis ground (-):

(E158) No. 27 (+) — Chassis ground (-):

(E158) No. 39 (+) — Chassis ground (-):

Is the voltage 8 V or more?

Yes

Repair the short circuit to power in the harness between ECM and front oxygen

(A/F) sensor connector.

No

Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Detect that λ value remains high.

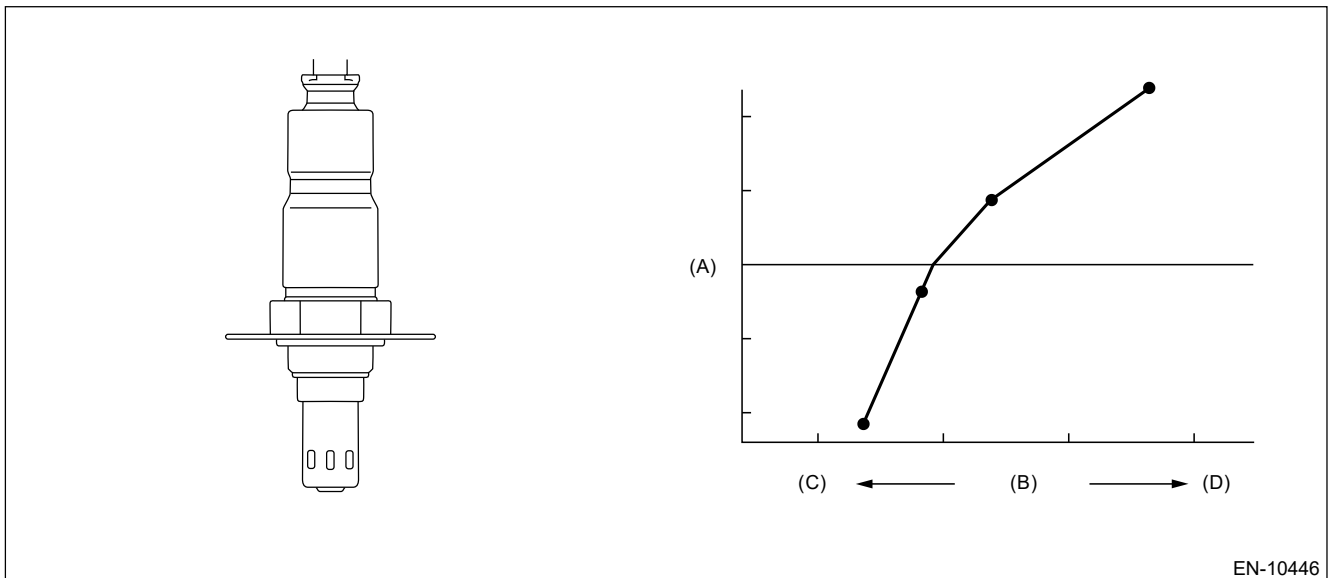
Judge as NG when lambda value is determined as abnormal in accordance with driving conditions such as intake air amount, sub feedback control, and front oxygen (A/F) sensor λ value and rear oxygen sensor voltage value.

λ value = Actual air fuel ratio/Theoretical air fuel ratio

$\lambda > 1$: Lean

$\lambda < 1$: Rich

2. COMPONENT DESCRIPTION



(A) Electromotive force

(B) Air fuel ratio

(C) Rich

(D) Lean

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Main feedback	In operation
Amount of intake air	≥ 6 g/s (0.21 oz/s)
Estimated temperature of the rear oxygen sensor element	$\geq 450^{\circ}\text{C}$ (842 $^{\circ}\text{F}$)

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
λ value	< 0.85
Rear oxygen sensor voltage value	≤ 0.15 V

Time needed for diagnosis: 10000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P219A BANK 1 AIR-FUEL RATIO IMBALANCE



DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Engine stalls.
- Improper idling

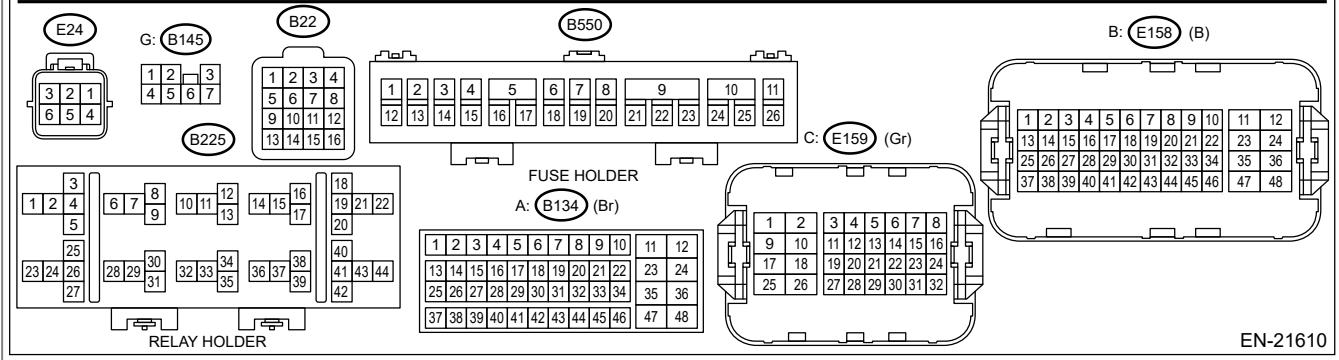
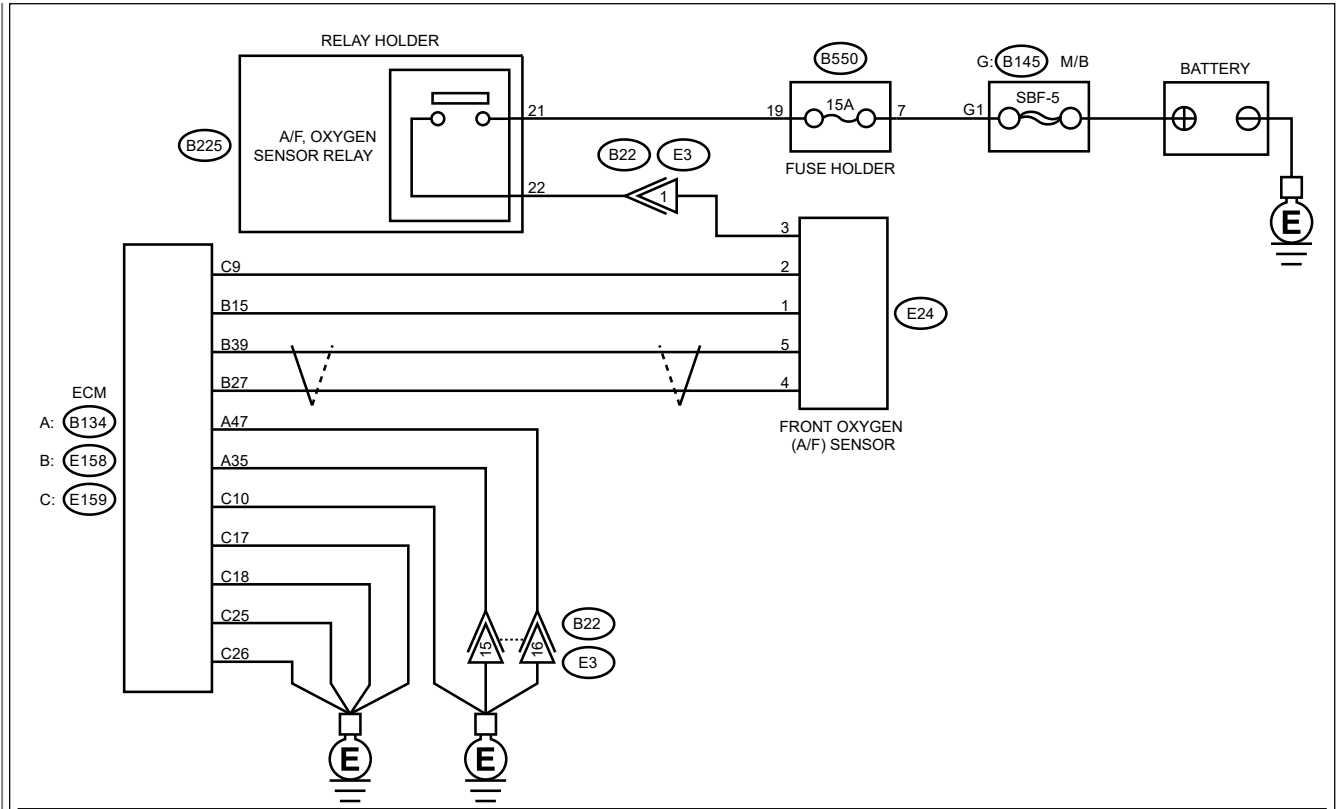
Caution:

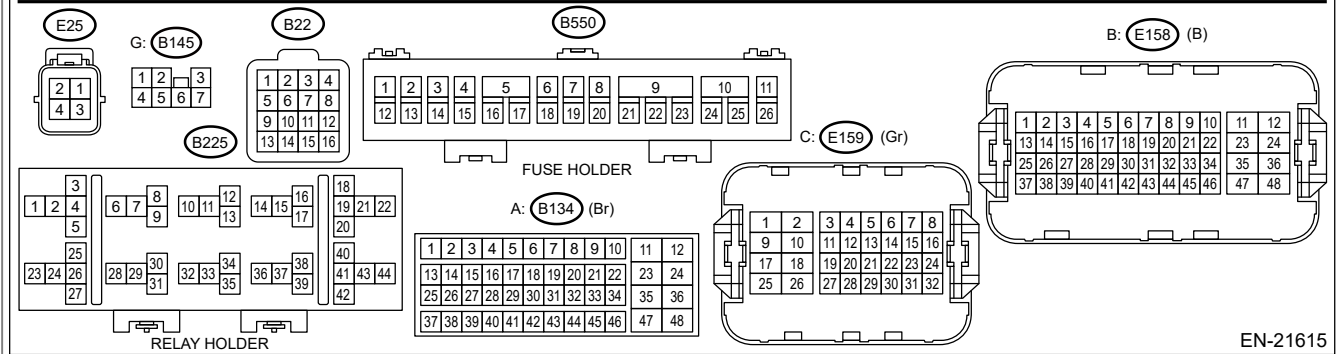
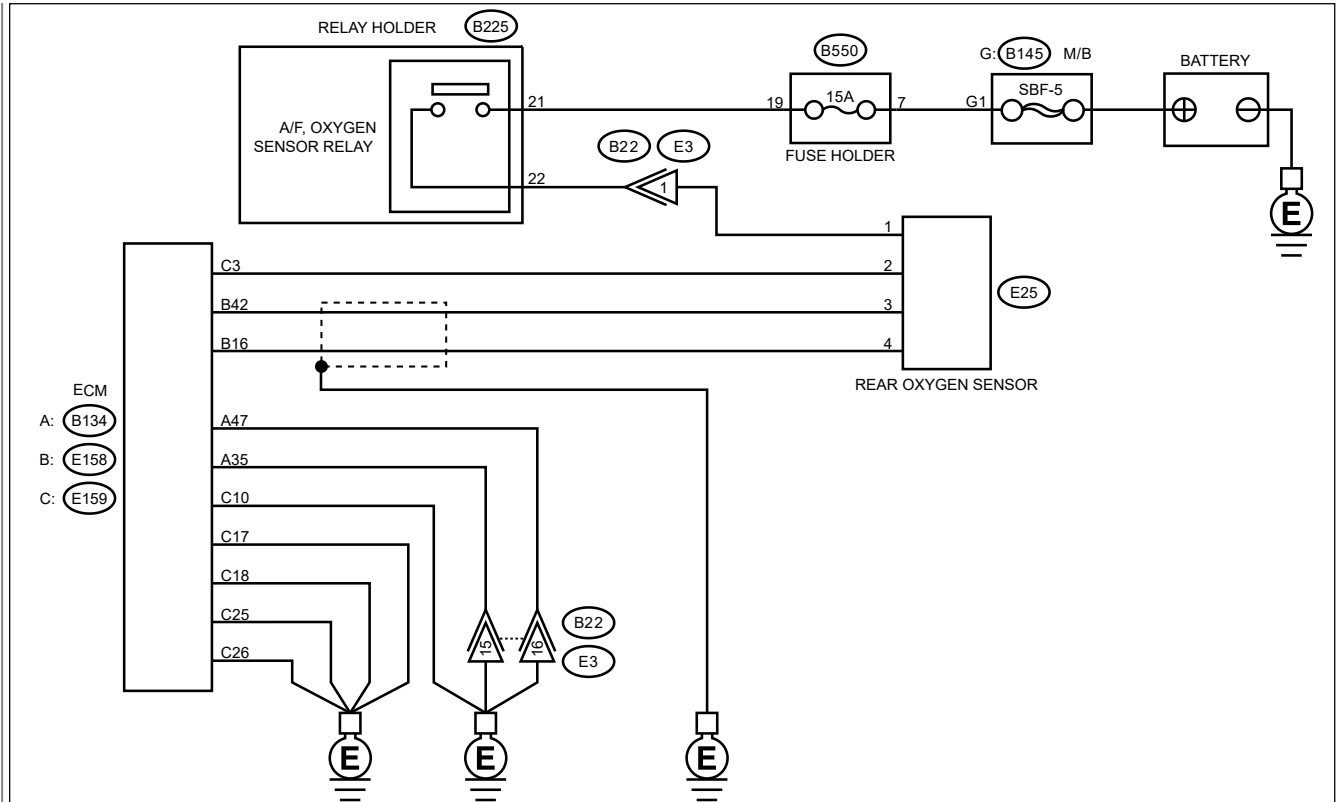
- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.

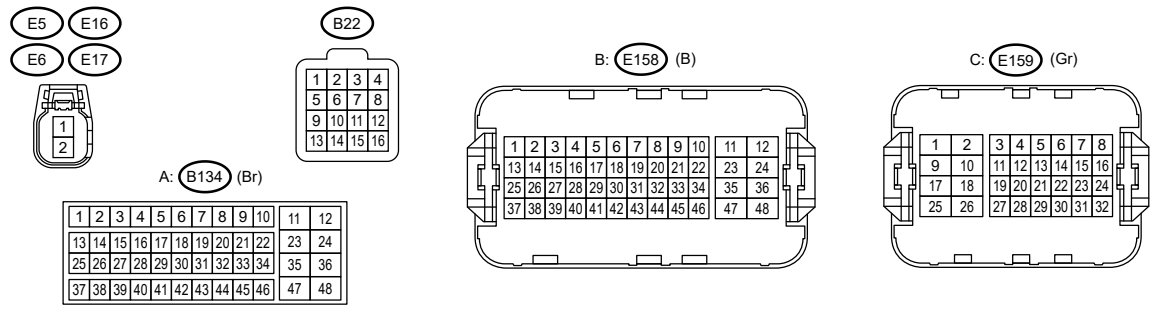
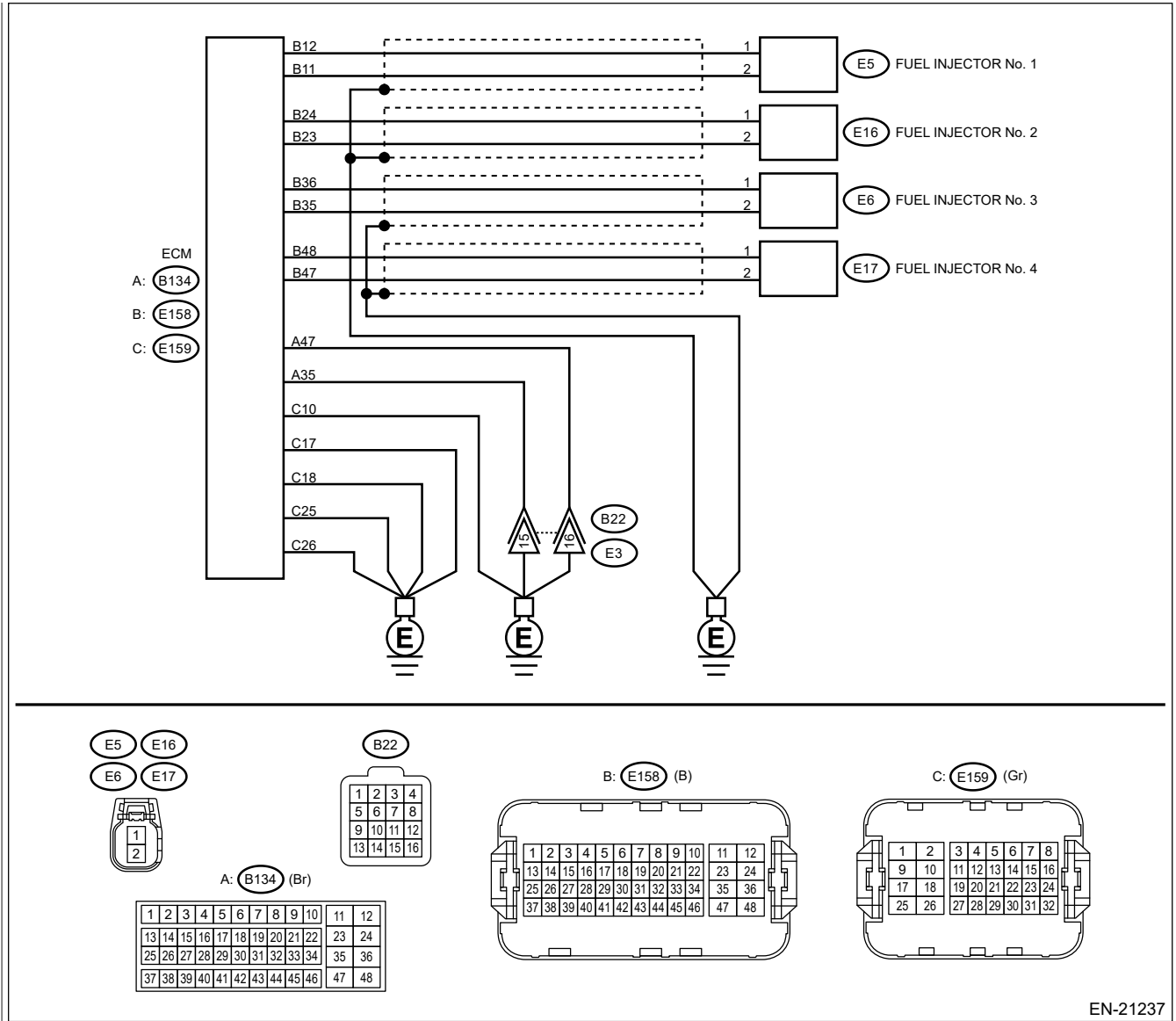






EN-21615





EN-21237

1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.



Has water entered the connector?

Yes

Completely remove any water inside.

No

[Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.

2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and front oxygen (A/F) sensor connector.

Connector & terminal

(E158) No. 15 — (E24) No. 1:

(E158) No. 27 — (E24) No. 4:

(E158) No. 39 — (E24) No. 5:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and front oxygen (A/F) sensor connector**
- **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

Measure the resistance between ECM and chassis ground.

Connector & terminal

(E158) No. 15 — Chassis ground:

(E158) No. 27 — Chassis ground:

(E158) No. 39 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair the ground short circuit of harness between ECM and front oxygen (A/F) sensor connector.

4. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.

Connector & terminal

(E24) No. 1 (+) — Chassis ground (-):

(E24) No. 4 (+) — Chassis ground (-):


(E24) No. 5 (+) — Chassis ground (—):

Is the voltage 8 V or more?

Yes

Repair the short circuit to power in the harness between ECM and front oxygen (A/F) sensor connector.

No

 [Go to 5.](#)


5. CHECK EXHAUST SYSTEM.

Are there holes or loose bolts on exhaust system?

Yes

Repair the exhaust system.

No

 [Go to 6.](#)

6. CHECK AIR INTAKE SYSTEM.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes

Repair the air intake system.

No

 [Go to 7.](#)


7. CHECK FUEL PRESSURE.

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

Be careful not to spill fuel.

1. Connect the front oxygen (A/F) sensor connector.
2. Measure the fuel pressure.  [Ref. to MECHANICAL\(H4DOTC\)>Fuel Pressure>INSPECTION.](#)

Caution:

Release fuel pressure before removing the fuel pressure gauge.

Is the measured value 328 — 358 kPa (3.3 — 3.7 kgf/cm², 48 — 52 psi)?

Yes

 [Go to 8.](#)

No

Check the fuel pump and fuel delivery line. [🔗 Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Pump>INSPECTION.](#) [🔗 Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Delivery and Evaporation Lines>INSPECTION.](#)

8. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Coolant Temp.].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor". [🔗 Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Coolant Temp.] 75°C (167°F) or more?

Yes

[🔗 Go to 9.](#)

No

Replace the engine coolant temperature sensor. [🔗 Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Coolant Temperature Sensor.](#)

9. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. Place the select lever in "P" range or "N" range.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Using the Subaru Select Monitor or a general scan tool, read the value of [Air Flow Rate from Mass Air Flow Sensor].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor". [🔗 Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Air Flow Rate from Mass Air Flow Sensor] 2.0 — 5.0 g/s (0.26 — 0.66 lb/m)?

Yes

[🔗 Go to 10.](#)


No

Replace the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

10. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. Place the select lever in "P" range or "N" range.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Open the front hood.
6. Measure the ambient temperature.
7. Using the Subaru Select Monitor or a general scan tool, read the value of [Intake Air Temperature (B1-S1)].

Note:


- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Subtract ambient temperature from [Intake Air Temperature (B1-S1)]. Is the obtained value -10 — 50°C (-18 — 90°F)?

Yes

 [Go to 11.](#)

No

Check the mass air flow and intake air temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Mass Air Flow and Intake Air Temperature Sensor.](#)

11. CHECK REAR OXYGEN SENSOR DATA.

1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and keep the engine speed at 3,000 rpm. (2 minutes maximum)
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Bank 1 - Sensor 2 present at that location].

Note:

- **Subaru Select Monitor**


For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

- **General scan tool**


For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Bank 1 - Sensor 2 present at that location] 0.490 V or more?

Yes

 [Go to 12.](#)

No

 [Go to 13.](#)

12. CHECK REAR OXYGEN SENSOR DATA.

1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and rapidly reduce the engine speed from 3,000 rpm.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Bank 1 - Sensor 2 present at that location].

Note:

- **Subaru Select Monitor**


For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

- **General scan tool**


For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Bank 1 - Sensor 2 present at that location] 0.250 V or less?

Yes

 [Go to 14.](#)

No

 [Go to 13.](#)

13. CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.

Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 15.](#)

14. CHECK FRONT OXYGEN (A/F) SENSOR USING REAR OXYGEN SENSOR SIGNAL.



1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), then keep the engine idling for 5 minutes or more.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Bank 1 - Sensor 2 present at that location].

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Bank 1 - Sensor 2 present at that location] kept at 0.250 V or less for 5 minutes or more?

Yes

Replace the front oxygen (A/F) sensor. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Front Oxygen \(A/F\) Sensor.](#)

No

[Go to 15.](#)

15. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from rear oxygen sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM and rear oxygen sensor connector.

Connector & terminal

(E158) No. 42 — (E25) No. 3:

(E158) No. 16 — (E25) No. 4:

Is the resistance less than 1 Ω?

Yes

[Go to 16.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and rear oxygen sensor connector**
- **Poor contact of coupling connector**

16. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.




1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between rear oxygen sensor connector and chassis ground.

Connector & terminal


(E25) No. 4 (+) — Chassis ground (-):

Is the voltage 0.2 — 0.5 V?

Yes

Replace the rear oxygen sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Rear Oxygen Sensor.](#)

No

 [Go to 17.](#)

17. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel injector on faulty cylinders.
3. Measure the resistance between fuel injector connector and engine ground on faulty cylinders.

Connector & terminal

#1 (E5) No. 1 — Engine ground:

#1 (E5) No. 2 — Engine ground:

#2 (E16) No. 1 — Engine ground:

#2 (E16) No. 2 — Engine ground:

#3 (E6) No. 1 — Engine ground:


#3 (E6) No. 2 — Engine ground:

#4 (E17) No. 1 — Engine ground:

#4 (E17) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 18.](#)

No

Repair the short circuit to ground in harness between ECM and fuel injector connector.

18. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.




Measure the resistance of harness between ECM and fuel injector connector on faulty cylinders.

Connector & terminal

- #1 (E158) No. 12 — (E5) No. 1:
- #1 (E158) No. 11 — (E5) No. 2:
- #2 (E158) No. 24 — (E16) No. 1:
- #2 (E158) No. 23 — (E16) No. 2:
- #3 (E158) No. 36 — (E6) No. 1:
- #3 (E158) No. 35 — (E6) No. 2:
- #4 (E158) No. 48 — (E17) No. 1:
- #4 (E158) No. 47 — (E17) No. 2:

Is the resistance less than 1 Ω ?


Yes

 [Go to 19.](#)

No


Repair the open circuit in harness between ECM and fuel injector connector.

19. CHECK FUEL INJECTOR.

Check the fuel injector on faulty cylinder.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Injector>INSPECTION.](#)

Are fuel injectors OK?

Yes

 [Go to 20.](#)



No

Replace the faulty fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Injector.](#)


20. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR/CRANKSHAFT POSITION SENSOR.

Is the camshaft position sensor or crankshaft position sensor loosely installed?

Yes

Tighten the camshaft position sensor or crankshaft position sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Camshaft Position Sensor>INSTALLATION.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Crankshaft Position Sensor>INSTALLATION.](#)

No


 [Go to 21.](#)

21. CHECK CRANKSHAFT POSITION SENSOR PLATE.




Is the crankshaft position sensor plate rusted or does it have broken teeth?

Yes

Replace the crankshaft position sensor plate.  [Ref. to MECHANICAL\(H4DOTC\)>Cylinder Block.](#)

No

 [Go to 22.](#)

22. CHECK INSTALLATION CONDITION OF TIMING CHAIN.




Turn the crankshaft using ST, and align the alignment mark on crank sprocket with alignment mark on cylinder block.


ST 18252AA000 CRANKSHAFT SOCKET

Is the timing chain dislocated from its proper position?

Yes

Correct the installation condition of timing chain.  [Ref. to MECHANICAL\(H4DOTC\)>Timing Chain Assembly.](#)

No


 [Go to 23.](#)

23. CHECK FUEL LEVEL.




Is the fuel meter indication higher than the "Lower" level?

Yes


 [Go to 24.](#)

No

Refill the fuel so that the fuel meter indication is higher than the "Lower" level, and proceed to the next step.  [Go to 24.](#)


24. CHECK STATUS OF MALFUNCTION INDICATOR LIGHT.




1. Clear the memory using the Subaru Select Monitor or general scan tool.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)
2. Start the engine, and drive the vehicle 10 minutes or more.

Does the malfunction indicator light illuminate or blink?

Yes

 [Go to 26.](#)

No

 [Go to 25.](#)

25. CHECK CAUSE OF MISFIRE.



Was the cause of misfire identified when the engine is running?

Yes

Finish diagnostics operation, if the engine has no abnormality.

No

Repair the poor contact of connector.

Note:

In this case, repair the following item:

- **Poor contact of ignition coil connector**
- **Poor contact of fuel injector connector on faulty cylinders**
- **Poor contact of ECM connector**
- **Poor contact of coupling connector**

26. CHECK AIR INTAKE SYSTEM.



Is there any fault in air intake system?

Yes


Repair the air intake system.

Note:

Check the following items.


- **Are there air leaks or air suction caused by loose or dislocated nuts and bolts?**
- **Are there cracks or any disconnection of hoses?**

No

 [Go to 27.](#)


27. CHECK MISFIRE SYMPTOM.




1. Turn the ignition switch to ON.
2. Check for DTC.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)

Does the Subaru Select Monitor or general scan tool indicate only one DTC?

Yes

 [Go to 30.](#)

No

 [Go to 28.](#)

28. CHECK DTC.



Is DTC P0301 and P0303 displayed on the Subaru Select Monitor or general scan tool?

Yes

[Go to 31.](#)

No

[Go to 29.](#)

29. CHECK DTC.



Is DTC P0302 and P0304 displayed on the Subaru Select Monitor or general scan tool?

Yes

[Go to 32.](#)

No

[Go to 33.](#)

30. ONLY ONE CYLINDER.



Is there any fault in the cylinder?

Yes

Repair or replace faulty parts.

Note:

Check the following items.

- **Spark plug**
- **Ignition coil**
- **Fuel injector**
- **Compression**

No

Go to DTC P0171. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0171 SYSTEM TOO LEAN BANK 1.](#)

31. GROUP OF #1 AND #3 CYLINDERS.



Are there any faults in #1 and #3 cylinders?

Yes


Repair or replace faulty parts.

Note:

Check the following items.

- Spark plug
- Ignition coil
- Fuel injector
- Compression
- Skipping timing chain teeth

No

Go to DTC P0171.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0171 SYSTEM TOO LEAN BANK 1.](#)

32. GROUP OF #2 AND #4 CYLINDERS.

Are there any faults in #2 and #4 cylinders?

Yes


Repair or replace faulty parts.

Note:

Check the following items.

- Spark plug
- Ignition coil
- Fuel injector
- Compression
- Skipping timing chain teeth


No

Go to DTC P0171.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0171 SYSTEM TOO LEAN BANK 1.](#)

33. CYLINDER AT RANDOM.

Is the engine idle rough?

Yes

Go to DTC P0171.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0171 SYSTEM TOO LEAN BANK 1.](#)

No

Repair or replace faulty parts.

Note:

Check the following items.

- Spark plug
- Ignition coil
- Fuel injector
- Compression

1. OUTLINE OF DIAGNOSIS

This diagnostic monitor performs a functional check of the fuel system to determine an air-fuel ratio cylinder imbalance.

This diagnosis is composed of two monitors.

The outline of "monitor A1" is as follows. When an air-fuel ratio cylinder imbalance occurs, the primary oxygen sensor output signal will oscillate with increased amplitude. This monitor utilizes this behavior to make a diagnosis. The monitor integrates the difference between the amplification value and the mean value of the first oxygen sensor output signal and compares it to a threshold to make a judgment.

The outline of "monitor B1" is as follows. Similarly, when an imbalance occurs, the engine speed also fluctuates with increased amplitude. This monitor utilizes this behavior to make a diagnosis. For reference, it should be noted that this imbalance monitor method is actually similar to the current misfire diagnostic monitor, and the parameter "domg360" (units: degrees CA) is shared between the imbalance and misfire monitors. The imbalance monitor is performed during idle condition when the engine is warm. The monitor integrates the count of "domg360" which exceeds a threshold in 1000 revolution.

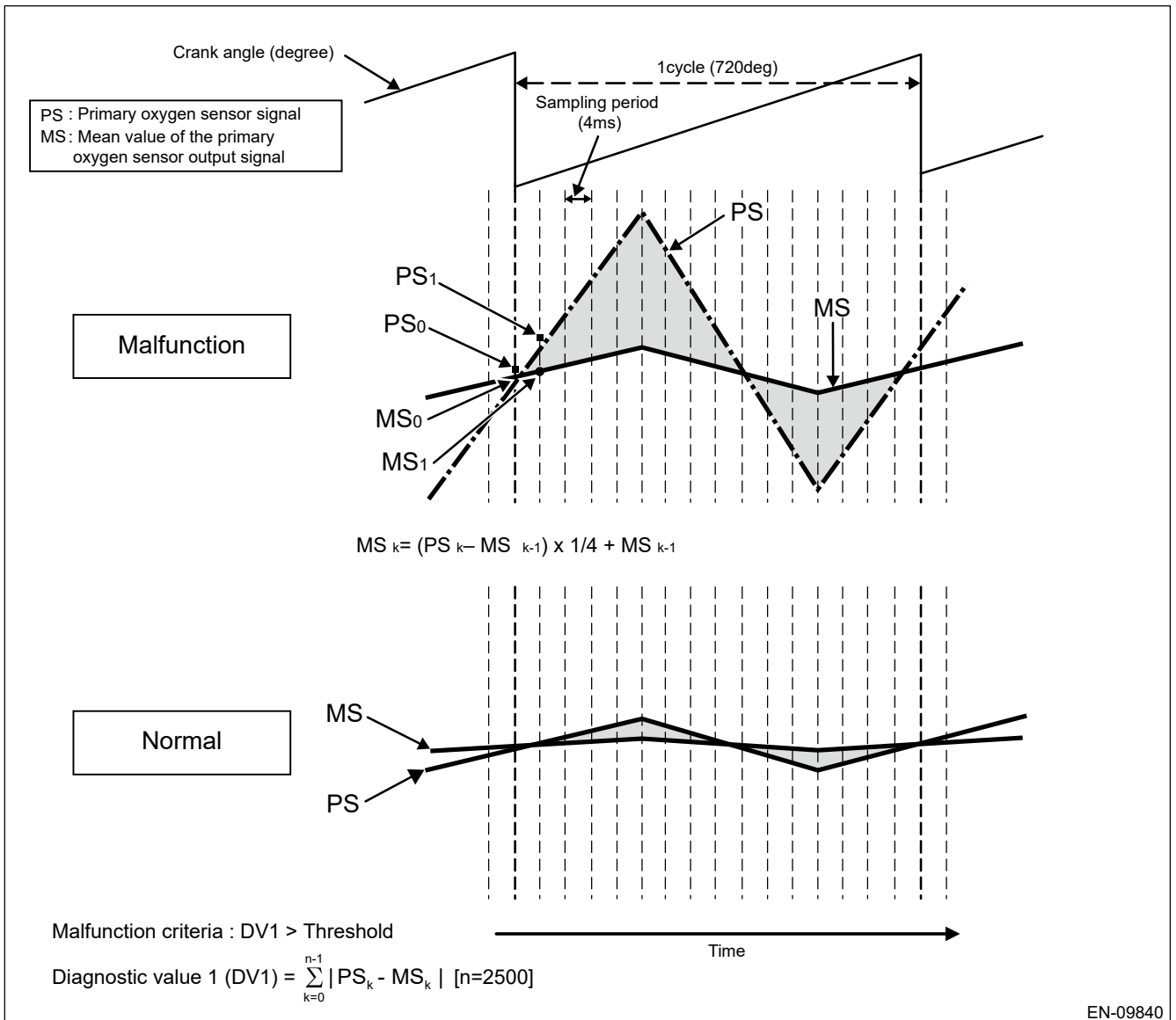
When both the "monitor A1" value and the "monitor B1" value exceed a predetermined threshold, this monitor determines a malfunction and stores a fault code.

MONITOR A1

When there is an air-fuel ratio cylinder imbalance malfunction, the primary oxygen sensor output fluctuates widely compared with a normal sensor, as shown by the chain line in Figure 1 below.

This monitor makes a diagnosis based on this phenomenon. Each primary oxygen sensor signal (PS) and mean value of the primary oxygen sensor signal (MS) is calculated from the primary oxygen sensor signal. The absolute values of (PS - MS) are sampled every 4 ms as shown in the figure. Diagnostic value 1 (DV1) is obtained by integrating the absolute value of (PS - MS) for 2500 times. A malfunction is determined when DV1 exceeds the threshold. The judgment values are determined experimentally.

Figure 1. Compare malfunctioned primary oxygen sensor output with a normal sensor



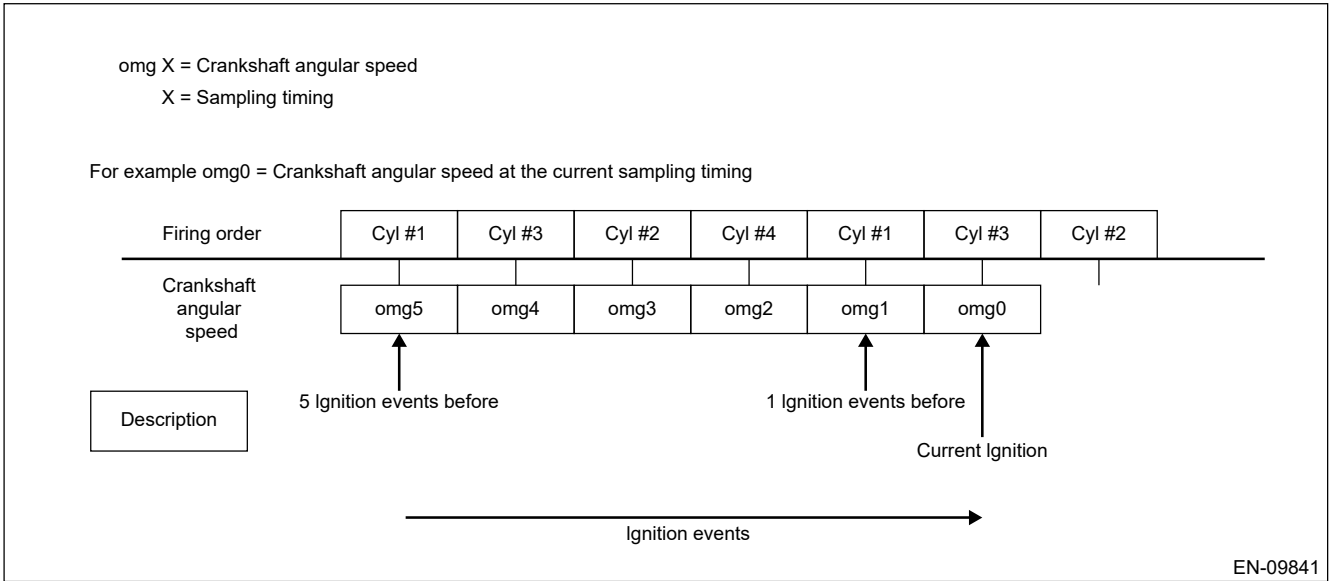
MONITOR B1

Method used: Difference method of 360 degrees CA

Monitor value: $\text{domg360} = (\text{omg } 1 - \text{omg } 0) - (\text{omg } 3 - \text{omg } 2) = \text{angular speed}$

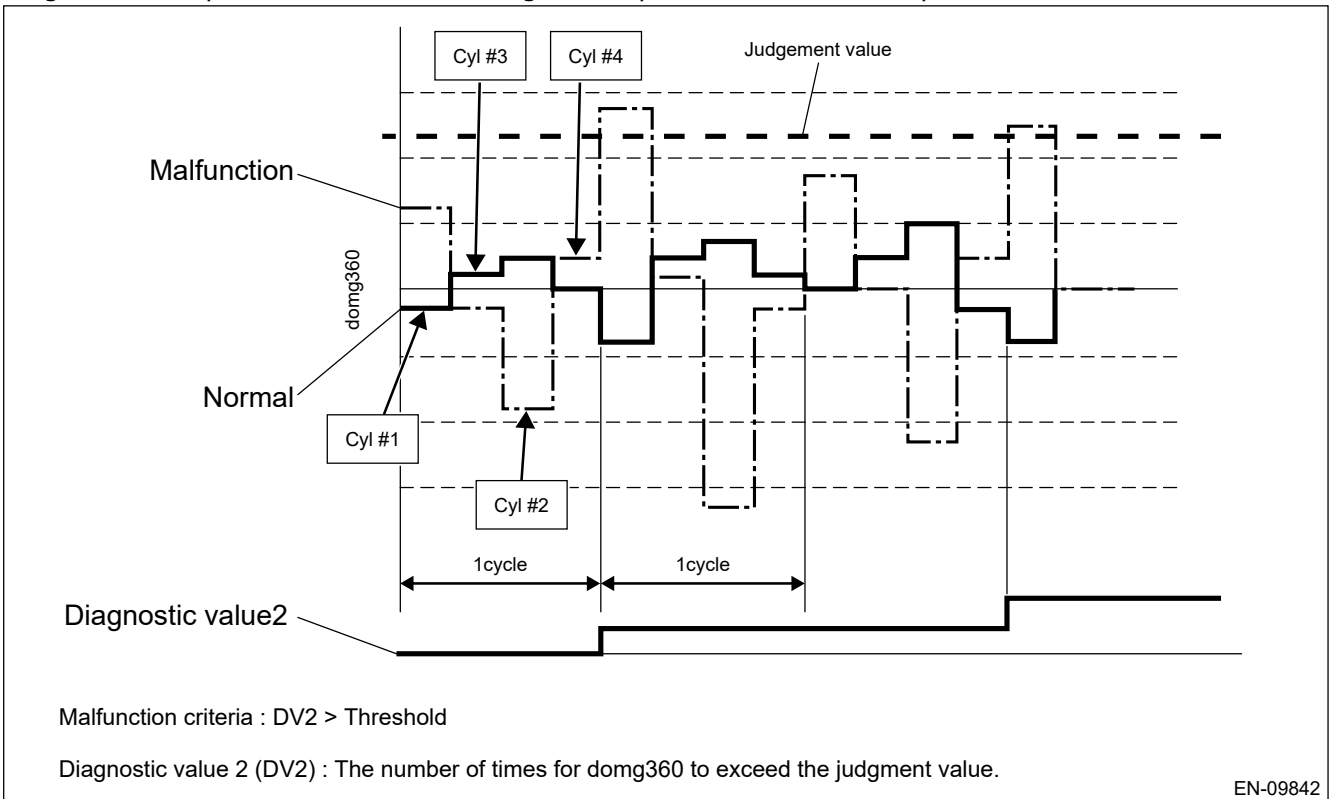
Each crankshaft angular speed is defined as Figure 2 below.

Figure 2. Description of domg360 output



This method uses the fact that the domg360 of lean conditioned cylinder caused by imbalance malfunction indicates big value, as shown by the chain line in Figure 3 below. The number of times for domg360 to exceed the judgment value in 1000 revolutions (500 cycles) is calculated as diagnostic value 2 (DV2). A malfunction is determined when DV2 exceeds the threshold.

Figure 3. Compare malfunctioned domg360 output with a normal output



2. EXECUTION CONDITION

Monitor A1: Primary oxygen sensor fluctuation

Secondary Parameters	Execution condition
----------------------	---------------------

Battery voltage	≥ 10.9 V
Barometric pressure	≥ 75 kPa (563 mmHg, 22.2 inHg)
Main feedback	In operation
Engine speed	> 1500 rpm and < 4000 rpm
Charging efficiency	> 70% air mass %
(Target A/F in order to stabilize the Oxygen Storage Component in the catalyst after fuel cut recovery for time)	≠ Rich ≥ 0.5 sec

Monitor B1: Crankshaft speed fluctuation

Secondary Parameters	Execution condition
Misfiring diagnosis monitoring	In operation
Accelerator pedal position	≠ 0%
Vehicle speed	≤ 482.8 km/h (300 MPH)
Main feedback	In operation
Engine speed	> 1500 rpm and < 4000 rpm
Charging efficiency	> 70 air mass % and < 255 air mass %

3. GENERAL DRIVING CYCLE

Perform the diagnosis every time after the enable conditions have been established.

4. DIAGNOSTIC METHOD

Judge as NG when Monitor A1 and Monitor B1 are both NG, and when either is OK, judge as OK.

Monitor A1

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Diagnostic value 1 (DV1)	> Threshold value 1 (TV1)

Threshold value 1 (TV1):

$$\sum_{k=0}^{n-1} \text{Map}_k$$

[n=2500]

EN-09888

Map

		Charging efficiency (air mass %)							
		70	80	90	100	110	120	140	160
Engine speed (rpm)	1500	0.001	0.001	0.002	0.005	0.004	0.004	0.004	0.004
	2000	0.000	0.002	0.005	0.007	0.007	0.007	0.007	0.007
	2500	0.001	0.004	0.005	0.010	0.012	0.017	0.024	0.024
	3000	0.001	0.003	0.006	0.011	0.017	0.022	0.022	0.022
	3500	0.003	0.006	0.011	0.018	0.023	0.027	0.027	0.027
	4000	0.008	0.012	0.018	0.025	0.025	0.028	0.037	0.035

Time needed for diagnosis: 10 seconds

Monitor B1

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Diagnostic Value2 (DV2)	> 17 count

Time needed for diagnosis: 1000 engine revs.

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2227 BAROMETRIC PRESSURE SENSOR "A" CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..


1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check DTC using "List of Diagnostic Trouble Code (DTC)".  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>List of Diagnostic Trouble Code (DTC)..

No

Replace the ECM.  Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DOTC)>Engine Control Module (ECM)..

Note:

The barometric pressure sensor is built into the ECM.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of barometric pressure sensor output property.

Judge as NG when the barometric pressure sensor output is largely different from the intake manifold pressure at engine start.

2. COMPONENT DESCRIPTION

The barometric pressure sensor is built into the ECM.

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Soaking time	≥ 60 s
Elapsed time after ignition switch is turned to ON	< 60 s

4. GENERAL DRIVING CYCLE

Perform the diagnosis once at ignition switch ON.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Barometric pressure – Intake manifold pressure at engine start	≥ 12.73 kPa (95.5 mmHg, 3.8 inHg)

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2228 BAROMETRIC PRESSURE SENSOR "A" CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..


1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check DTC using "List of Diagnostic Trouble Code (DTC)".  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>List of Diagnostic Trouble Code (DTC)..

No

Replace the ECM.  Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DOTC)>Engine Control Module (ECM)..

Note:

The barometric pressure sensor is built into the ECM.

1. OUTLINE OF DIAGNOSIS

Detect the open/short circuit of the barometric pressure sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION

The barometric pressure sensor is built into the ECM.

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

--

Malfunction Criteria	Threshold Value
Output voltage	< 1.76 V

Time needed for diagnosis: 520 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2229 BAROMETRIC PRESSURE SENSOR "A" CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition


Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..


1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

Yes

Check DTC using "List of Diagnostic Trouble Code (DTC)".  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>List of Diagnostic Trouble Code (DTC)..

No

Replace the ECM.  Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DOTC)>Engine Control Module (ECM)..

Note:

The barometric pressure sensor is built into the ECM.

1. OUTLINE OF DIAGNOSIS

Detect the open/short circuit of the barometric pressure sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION

The barometric pressure sensor is built into the ECM.

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

--	--

Malfunction Criteria	Threshold Value
Output voltage	> 4.88 V

Time needed for diagnosis: 520 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2270 O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 2

DTC detecting condition:

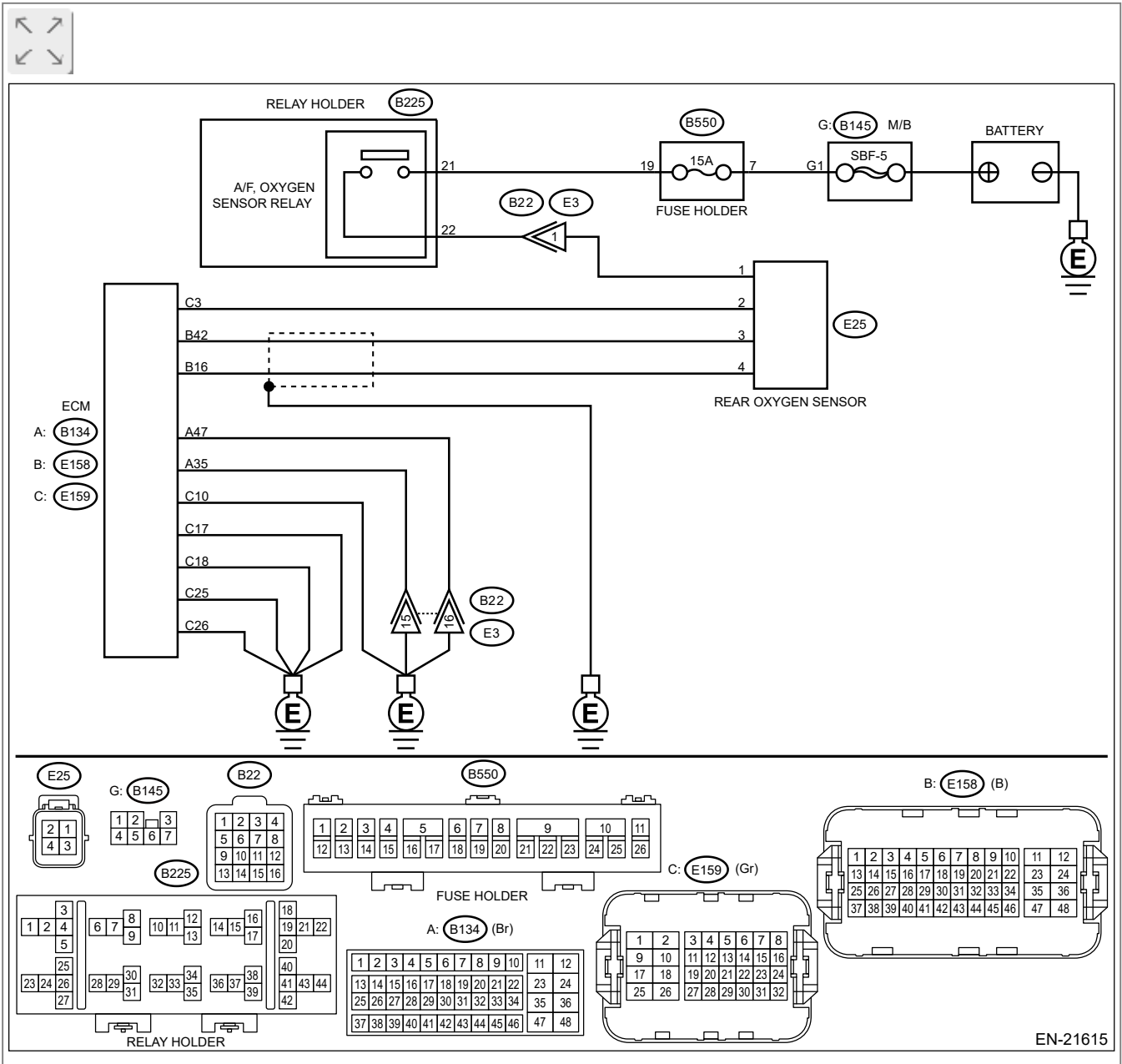
Detected when two consecutive driving cycles with fault occur.

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK REAR OXYGEN SENSOR CONNECTOR.

Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from rear oxygen sensor.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.

Connector & terminal

(E158) No. 42 — (E25) No. 3:

(E158) No. 16 — (E25) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit of harness between ECM connector and rear oxygen sensor connector.

3. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between rear oxygen sensor connector and engine ground.

Connector & terminal


(E25) No. 3 (+) — Engine ground (-):

Is the voltage 2 V or more?

Yes

 [Go to 4.](#)

No

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\).](#)

4. CHECK EXHAUST SYSTEM.



Check exhaust system parts.

Note:

Check the following items.

- **Looseness and improper fitting of exhaust system parts**
- **Damage (crack, hole etc.) of parts**
- **Damage (crack, hole etc.) between front oxygen (A/F) sensor and rear oxygen sensor**

Is there any fault in exhaust system?

Yes

Repair or replace faulty parts.

No

Replace the rear oxygen sensor.

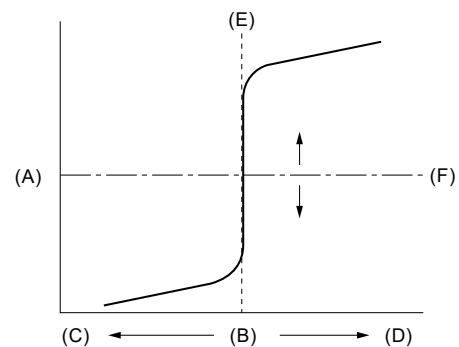
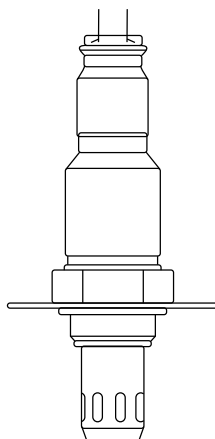
1. OUTLINE OF DIAGNOSIS

Detect the stuck of rear oxygen sensor voltage in lean state.

When rear oxygen sensor voltage remains below the threshold value for predetermined time, diagnosis system starts the control to raise the target air fuel ratio.

Judge as NG detecting the stuck in lean state when rear oxygen sensor voltage remains below the threshold value even after the interrupt control.

2. COMPONENT DESCRIPTION



EN-10447

(A) Electromotive force

(B) Air fuel ratio

(C) Lean

(D) Rich

(E) Theoretical air fuel ratio

(F) Comparative voltage

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	$\geq 10.9 \text{ V}$
Sub feedback	In operation
Amount of intake air	$\geq 10 \text{ g/s (0.35 oz/s)}$
Estimated temperature of the rear oxygen sensor element	$\geq 450^\circ\text{C (842}^\circ\text{F)}$
Enable conditions at interrupt control are as follows	
Air fuel ratio reduced from target air fuel ratio	= Value of Map
Continuous time when rear oxygen sensor output voltage is less than 0.55 V	$\geq 5000 \text{ ms}$

Map

Output voltage of rear oxygen sensor v	0.00	0.10	0.15	0.30	0.40	0.50	0.60
Air fuel ratio reduced from target air fuel ratio %	15	15	5	4	4	4	4

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage of rear oxygen sensor	$< 0.55 \text{ V}$

Time needed for diagnosis: 15 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2271 O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 2

DTC detecting condition:

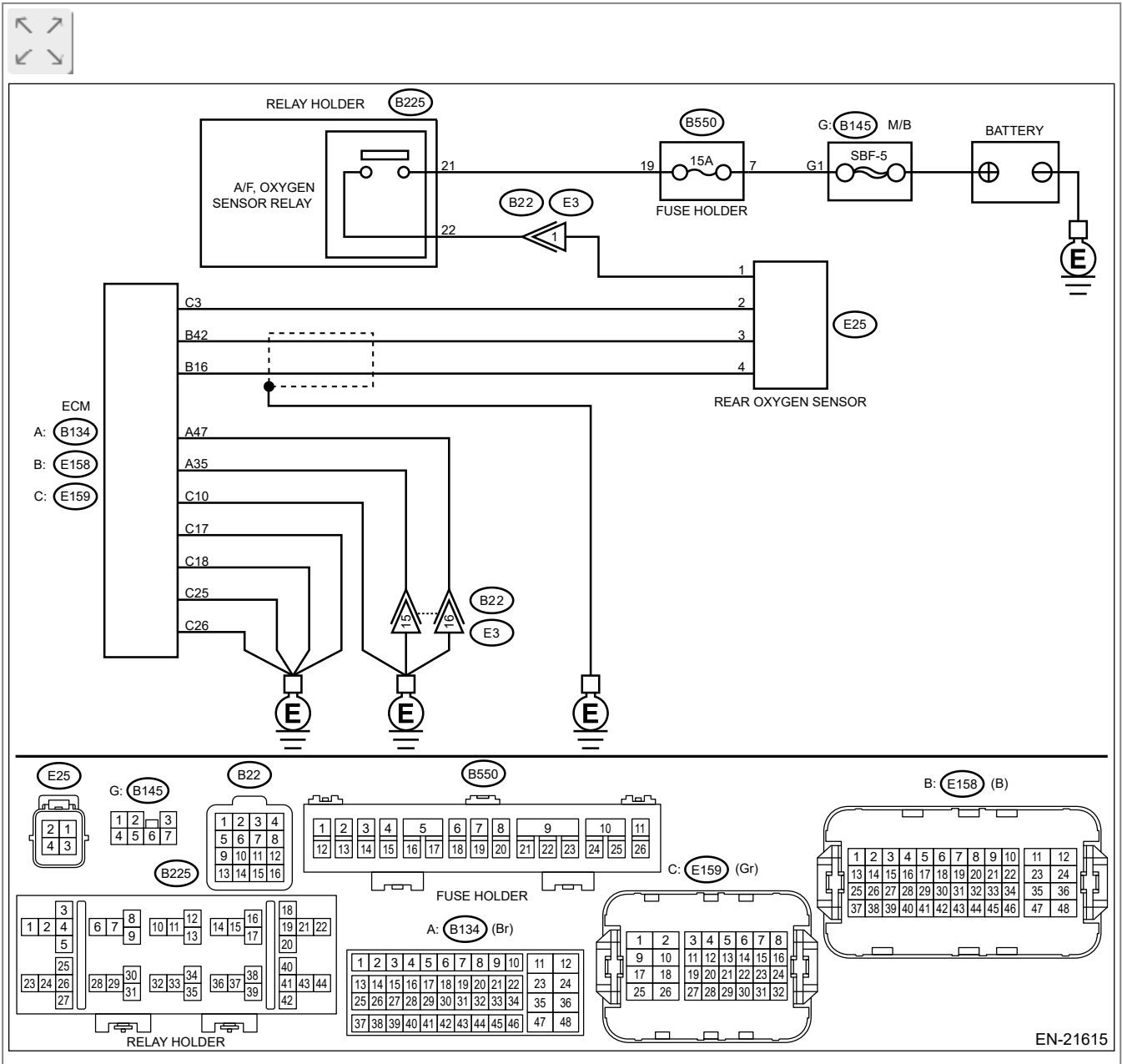
Detected when two consecutive driving cycles with fault occur.

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)




1. CHECK REAR OXYGEN SENSOR CONNECTOR.

Has water entered the connector?

Yes

Completely remove any water inside.

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the rear oxygen sensor connector.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.

Connector & terminal

(E158) No. 42 — (E25) No. 3:

(E158) No. 16 — (E25) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit of harness between ECM connector and rear oxygen sensor connector.

3. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.

Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(E158) No. 16 — Engine ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair the short circuit to ground in harness between ECM connector and rear oxygen sensor connector.

4. CHECK EXHAUST SYSTEM.



Check exhaust system parts.

Note:

Check the following items.


- **Looseness and improper fitting of exhaust system parts**
- **Damage (crack, hole etc.) of parts**
- **Damage (crack, hole etc.) between front oxygen (A/F) sensor and rear oxygen sensor**

Is there any fault in exhaust system?

Yes

Repair or replace faulty parts.

No

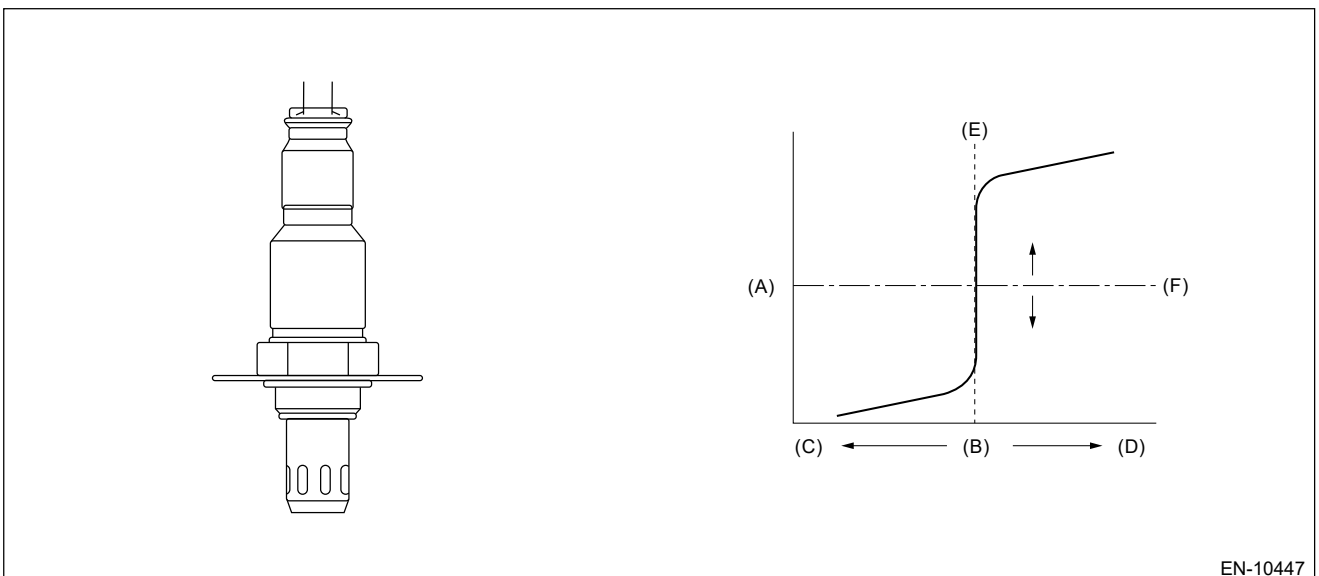
Replace the rear oxygen sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Rear Oxygen Sensor.](#)

1. OUTLINE OF DIAGNOSIS

Detect the stuck of rear oxygen sensor voltage in rich state.

Detect the stuck in rich state and judge as NG if rear oxygen sensor voltage remains above the threshold value for predetermined time.

2. COMPONENT DESCRIPTION



EN-10447

(A) Electromotive force

(B) Air fuel ratio

(C) Lean

(D) Rich

(E) Theoretical air fuel ratio

(F) Comparative voltage

3. EXECUTION CONDITION

Secondary Parameters	Execution
----------------------	-----------

	condition
Battery voltage	$\geq 10.9 \text{ V}$
Deceleration fuel cut for 5000 ms or more	Experienced
Estimated temperature of the rear oxygen sensor element	$\geq 450^{\circ}\text{C}$ (842°F)

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage of rear oxygen sensor	$> 0.15 \text{ V}$

Time needed for diagnosis: 0.5 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2401 EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT LOW

DTC detecting condition:

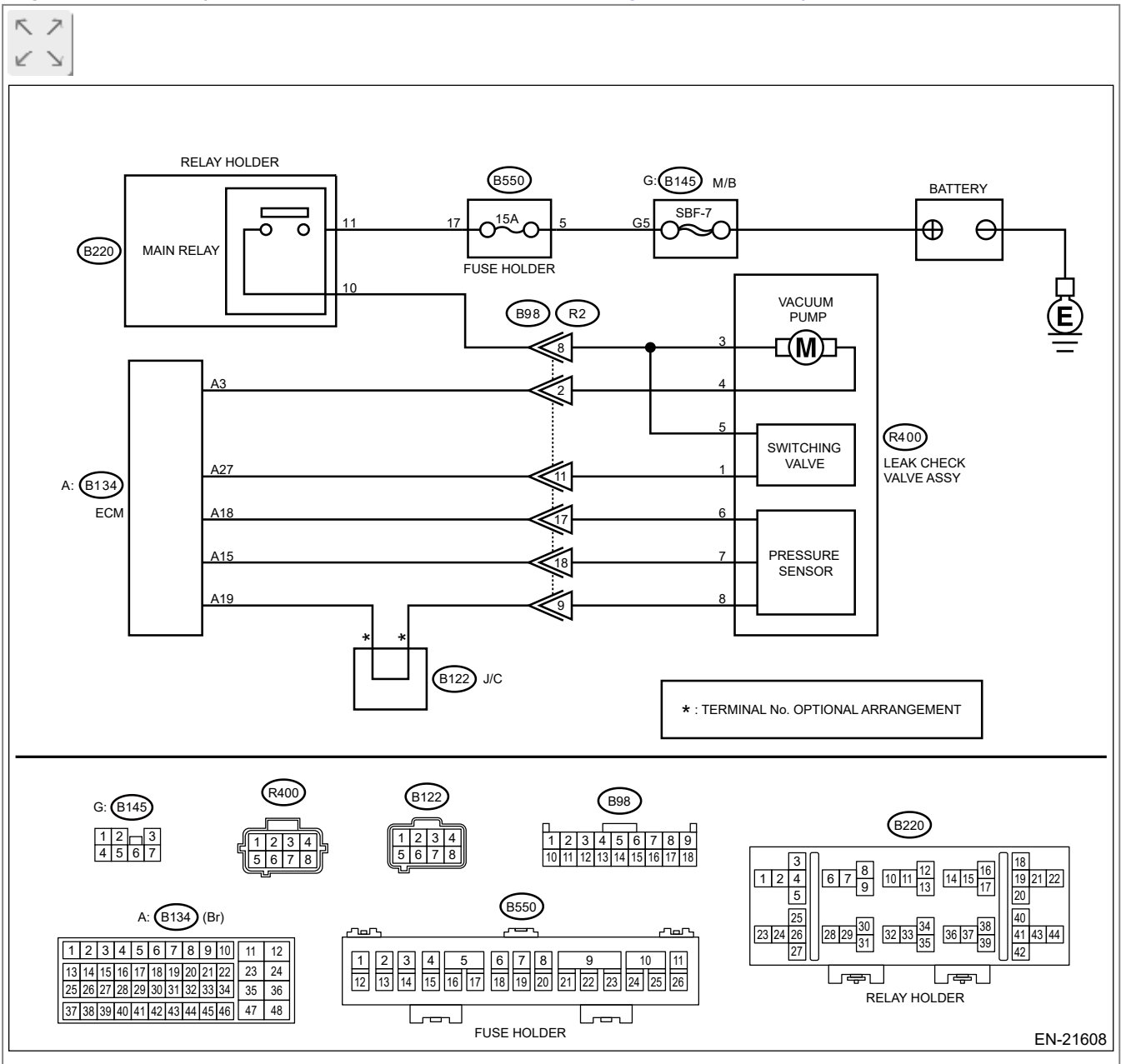
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#) and Inspection Mode  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode.](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to [WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)



1. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.



1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and chassis ground.

Connector & terminal

(B134) No. 3 (+) – Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

 [Go to 3.](#)

2. CHECK FOR POOR CONTACT.



Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes

Repair the poor contact of ECM connector.

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary open or short circuit of harness or temporary poor contact of connector may be the cause.

3. CHECK POWER SUPPLY TO LEAK CHECK VALVE ASSEMBLY.




Measure the voltage between the leak check valve assembly connector and engine ground.

Connector & terminal

(R400) No. 3 (+) – Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

Repair the power supply circuit.

4. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the leak check valve assembly.
3. Disconnect the connector from ECM.
4. Measure the resistance between leak check valve assembly and chassis ground.

Connector & terminal

(R400) No. 4 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM and leak check valve assembly connector.

5. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.



Measure the resistance of harness between ECM and the leak check valve assembly connector.

Connector & terminal

(B134) No. 3 — (R400) No. 4:

Is the resistance less than 1 Ω?

Yes

 [Go to 6.](#)

No

repair the harness and connector.


Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and the leak check valve assembly connector**
- **Poor contact of coupling connector**

6. CHECK LEAK CHECK VALVE ASSEMBLY.



Check the vacuum pump of the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly>INSPECTION >CHECK VACUUM PUMP.](#)

Is the vacuum pump of the leak check valve assembly OK?



Yes

Repair the poor contact in the leak check valve assembly connector.

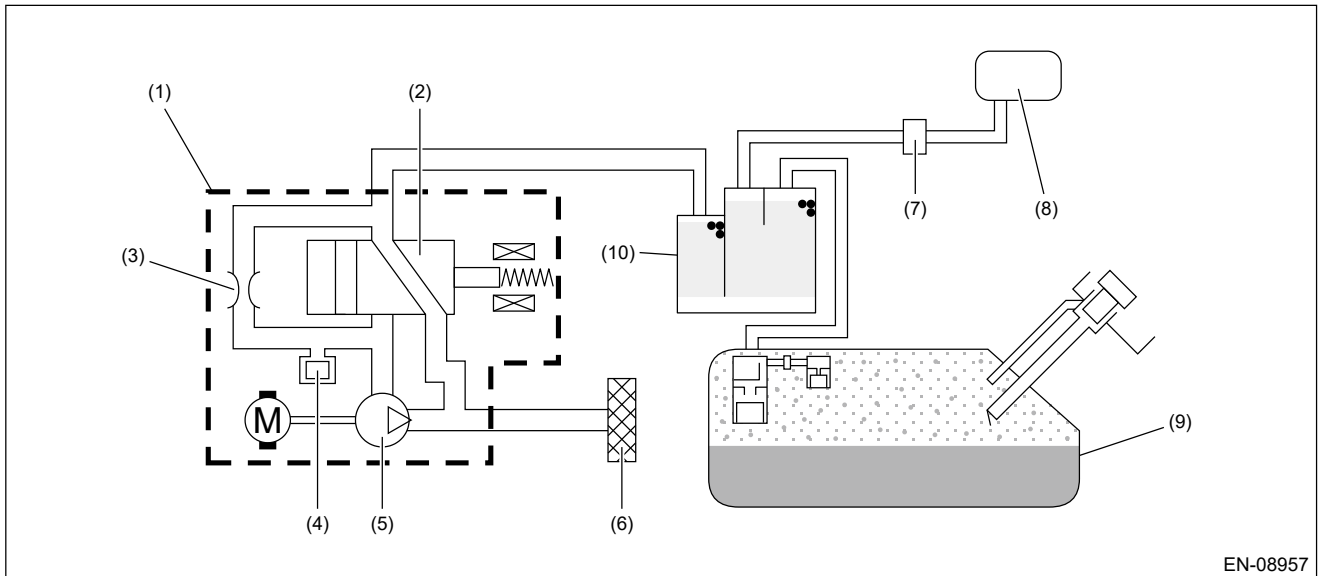
No

Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit in Evaporative Leak Check Module vacuum pump.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Leak check valve ASSY

(5) Vacuum pump

(9) Fuel tank

(2) Switching valve

(6) Drain filter

(10) Canister

(3) Reference orifice (0.02 inch orifice)

(7) Purge control solenoid valve

(4) Pressure sensor

(8) Intake manifold

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Evaporative Leak Check Module vacuum pump drive signal	OFF

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$\leq 2.2 \text{ V}$

Time needed for diagnosis: 2500 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2402 EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT HIGH

DTC detecting condition:

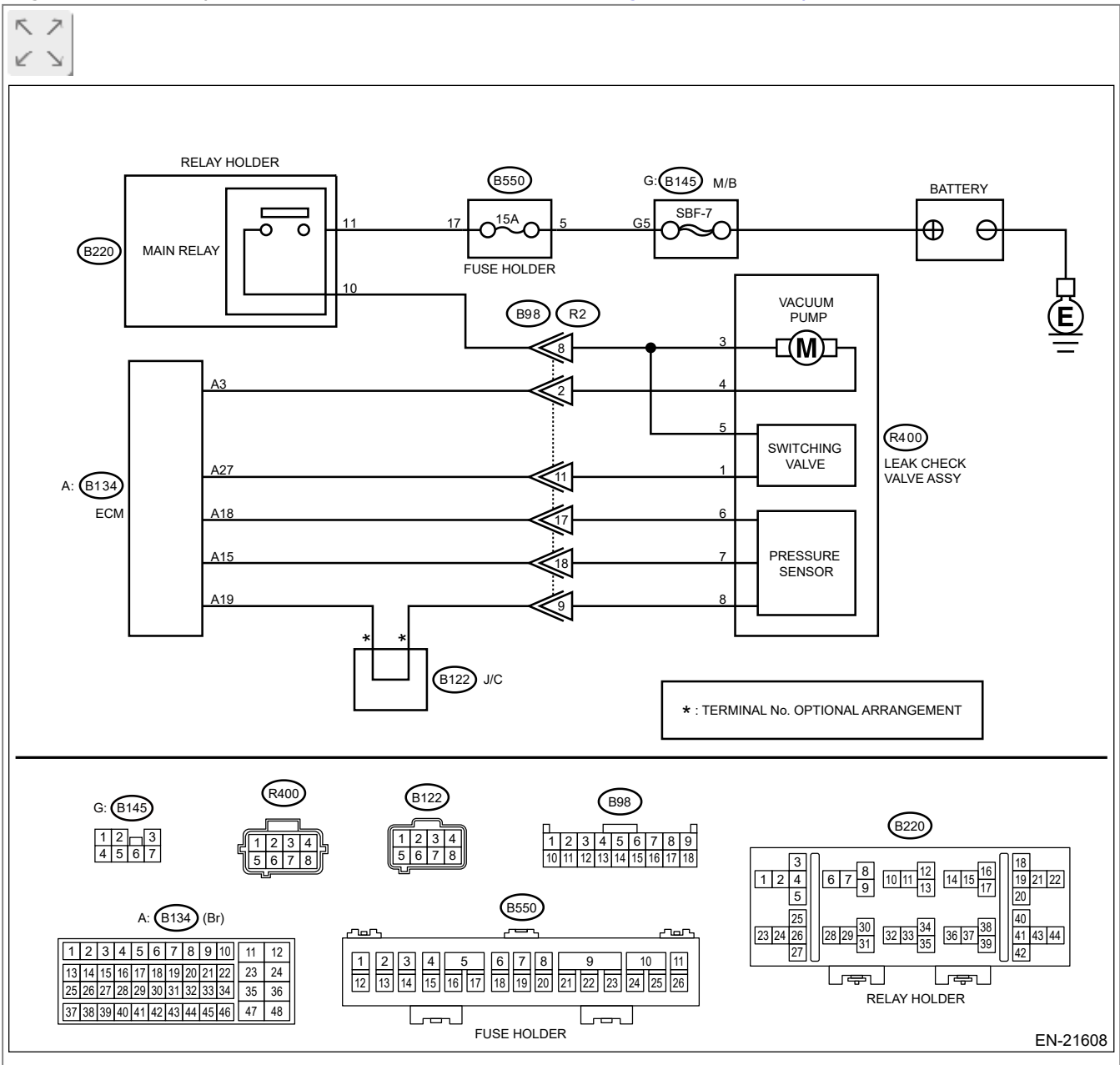
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the leak check valve assembly.
3. Turn the ignition switch to ON.
4. Measure the voltage between leak check valve assembly and chassis ground.

Connector & terminal

(R400) No. 4 (+) – Chassis ground (-):

Is the voltage 10 V or more?

Yes


Repair the short circuit to power in harness between ECM and leak check valve assembly connector.

No

 [Go to 2.](#)

2. CHECK LEAK CHECK VALVE ASSEMBLY.




1. Turn the ignition switch to OFF.
2. Check the vacuum pump of the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly>INSPECTION > CHECK VACUUM PUMP.](#)

Is the check result OK?

Yes

Repair the poor contact in the leak check valve assembly connector.

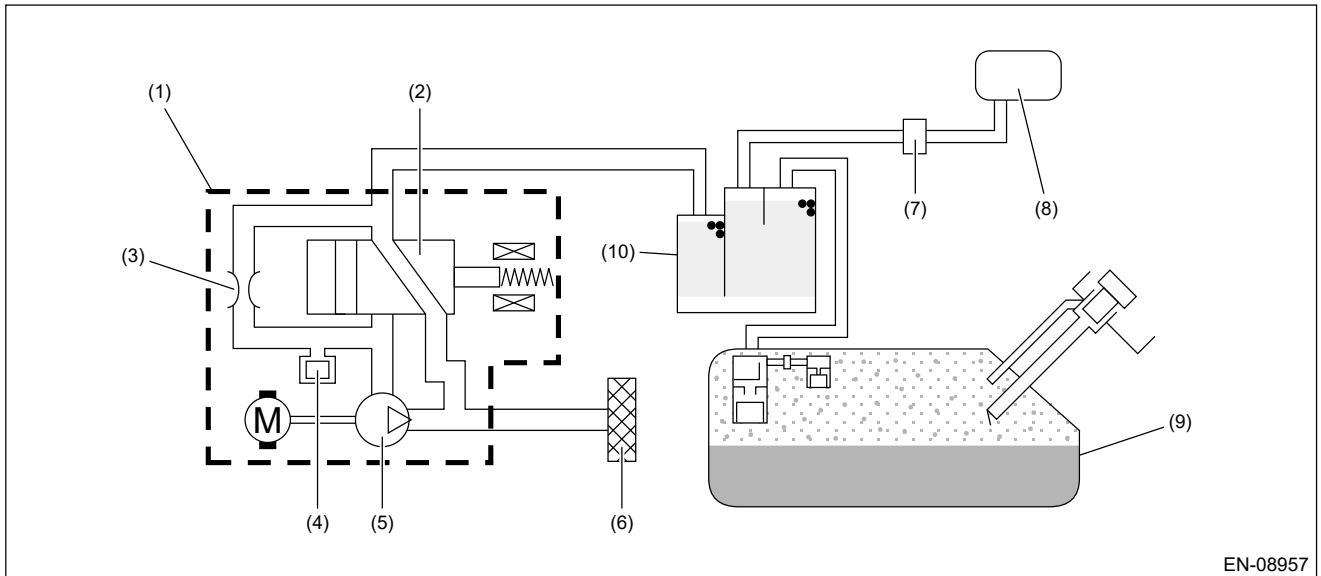
No

Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit in Evaporative Leak Check Module vacuum pump.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



- (1) Leak check valve ASSY
- (2) Switching valve
- (3) Reference orifice (0.02 inch orifice)
- (4) Pressure sensor
- (5) Vacuum pump
- (6) Drain filter
- (7) Purge control solenoid valve
- (8) Intake manifold
- (9) Fuel tank
- (10) Canister

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Evaporative Leak Check Module vacuum pump drive signal	ON

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output current	≥ 5 A

Time needed for diagnosis: 2250 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2404 EVAP SYSTEM LEAK DETECTION PUMP SENSE CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

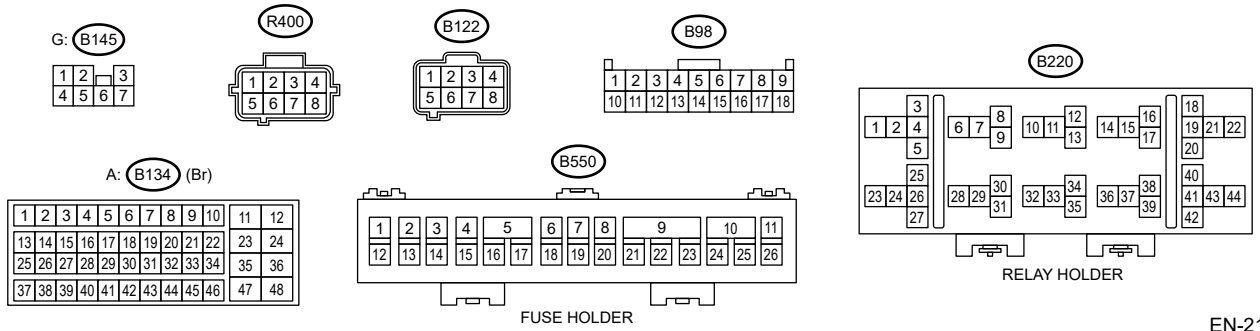
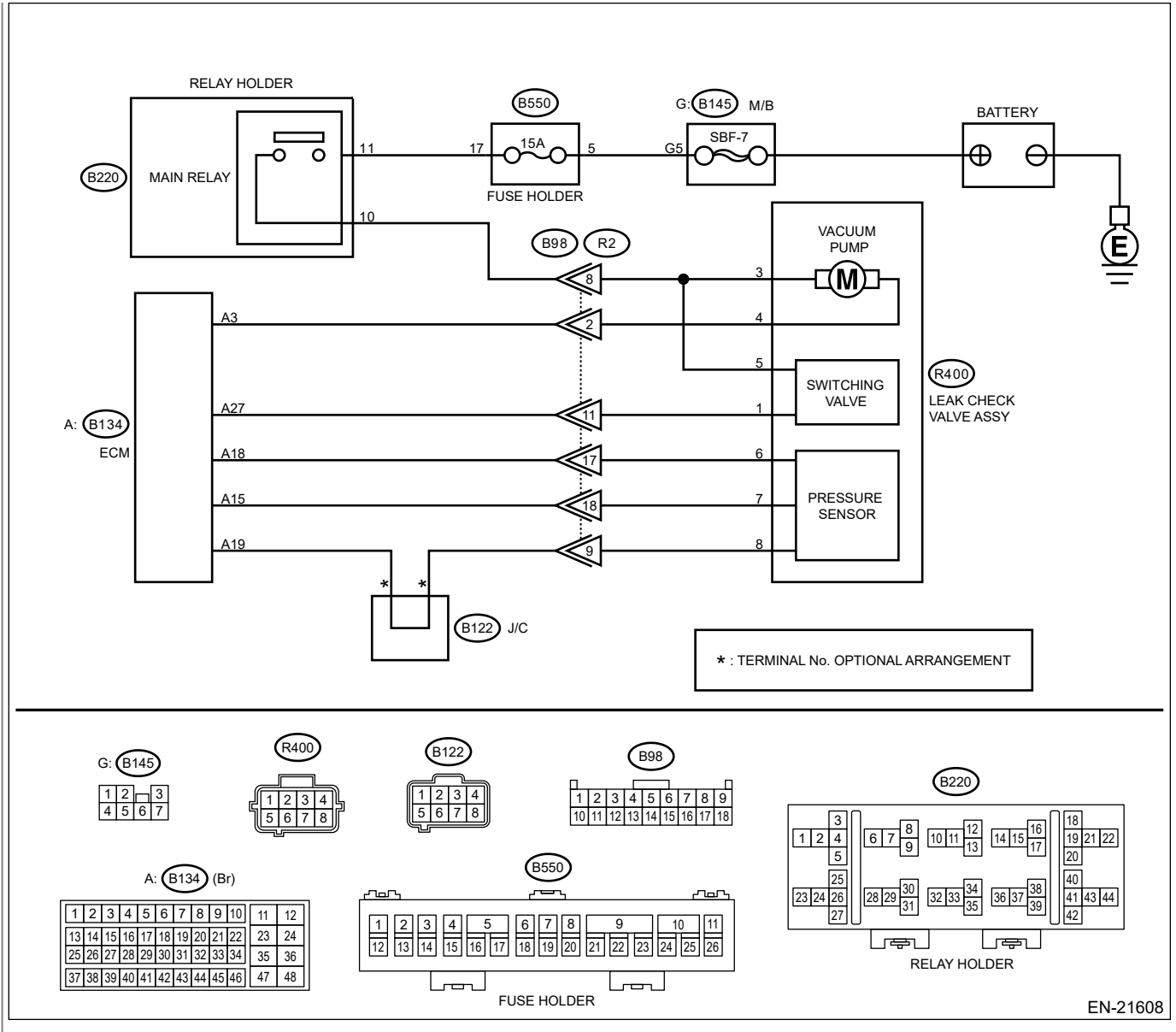
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#) and Inspection Mode  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode.](#)**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





EN-21608

1. CHECK FOR ANY OTHER DTC ON DISPLAY.



Is any other DTC displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".
[Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


[Go to 2.](#)

2. CHECK LEAK CHECK VALVE ASSEMBLY PUMP.



Using the Subaru Select Monitor, operate the leak check valve assembly pump.

Note:

For detailed procedures, refer to “Active Test”.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Active Test.](#)

Does the leak check valve assembly pump operate?

Yes

 [Go to 6.](#)

No

 [Go to 3.](#)

3. CHECK POWER SUPPLY OF LEAK CHECK VALVE ASSEMBLY.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the leak check valve assembly.
3. Turn the ignition switch to ON.
4. Measure the voltage between the leak check valve assembly connector and chassis ground.

Connector & terminal

(R400) No. 3 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between the main relay and the leak check valve assembly connector**
- **Poor contact of main relay connector**
- **Poor contact of coupling connector**

4. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM and the leak check valve assembly connector.

Connector & terminal

(B134) No. 3 — (R400) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 5.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and the leak check valve assembly connector**
- **Poor contact of coupling connector**

5. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.


1. Measure the resistance of harness between ECM and chassis ground.

Connector & terminal

(B134) No. 3 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly.](#)


No

Repair the short circuit to ground in harness between ECM and leak check valve assembly connector.

6. CHECK LEAK CHECK VALVE ASSEMBLY SWITCHING VALVE.


Using the Subaru Select Monitor, operate the leak check valve assembly switching valve.

Note:

For detailed procedures, refer to "Active Test".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Active Test.](#)

Does the leak check valve assembly switching valve operate?

Yes

 [Go to 10.](#)

No

 [Go to 7.](#)

7. CHECK POWER SUPPLY OF LEAK CHECK VALVE ASSEMBLY.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the leak check valve assembly.
3. Turn the ignition switch to ON.
4. Measure the voltage between the leak check valve assembly connector and chassis ground.

Connector & terminal

(R400) No. 5 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 8.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between the main relay and the leak check valve assembly connector**
- **Poor contact of main relay connector**
- **Poor contact of coupling connector**

8. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.




1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM and the leak check valve assembly connector.

Connector & terminal

(B134) No. 27 — (R400) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 9.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and the leak check valve assembly connector**
- **Poor contact of coupling connector**

9. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.




1. Measure the resistance of harness between ECM and chassis ground.

Connector & terminal

(B134) No. 27 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly.](#)

No

Repair the short circuit to ground in harness between ECM and leak check valve assembly connector.


10. CHECK EVAPORATIVE EMISSION CONTROL SYSTEM.



Perform drive cycle I. [Ref. to Target Not Found](#)

Is DTC P2404 displayed on the display?

Yes

Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly.](#)

No


Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0455.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0455 EVAP SYSTEM \(CPC\) LEAK DETECTED \(LARGE LEAK\).](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2419 EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT LOW

DTC detecting condition:

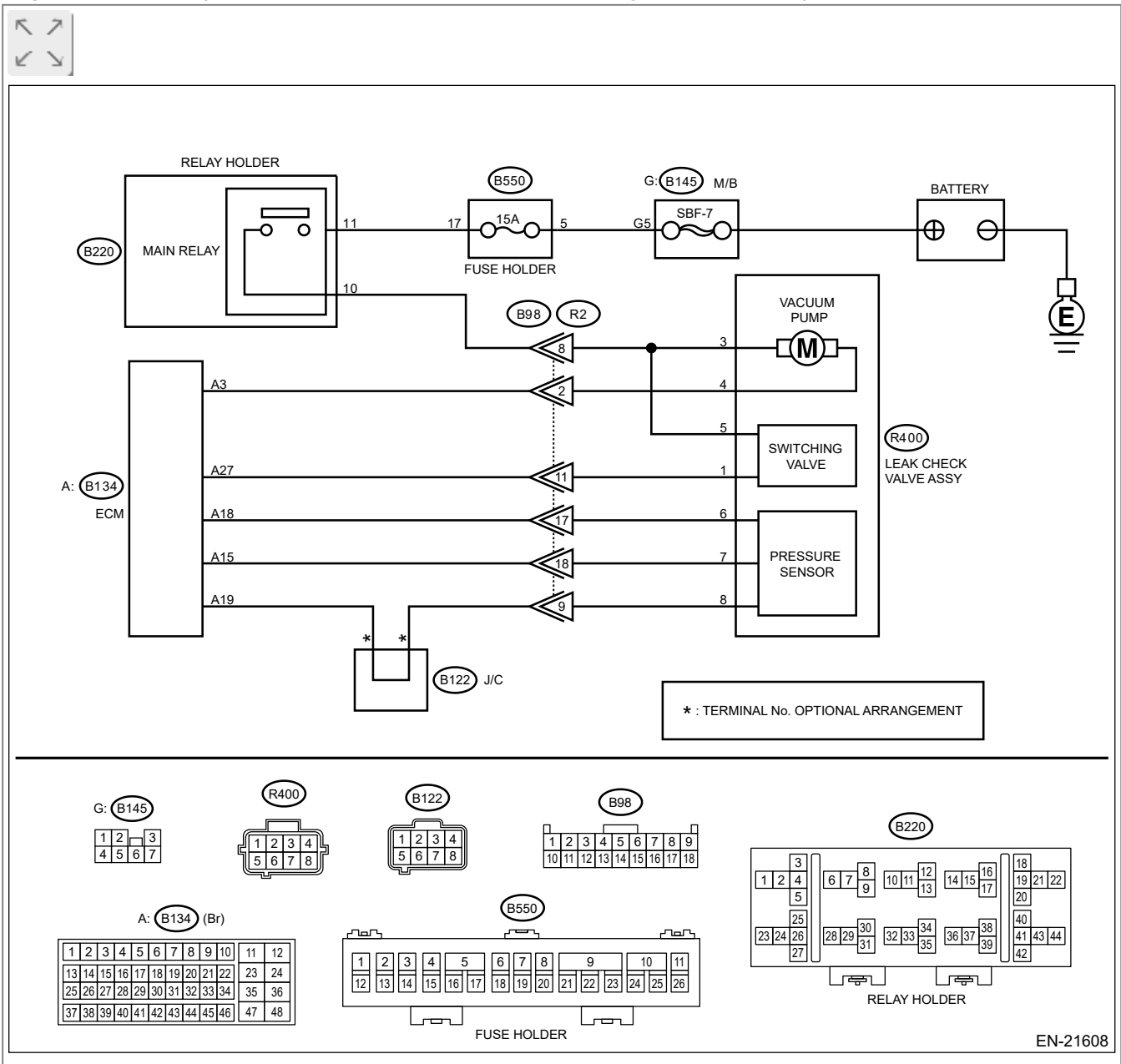
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.



1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and chassis ground.

Connector & terminal

(B134) No. 27 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

 [Go to 3.](#)

2. CHECK FOR POOR CONTACT.



Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes

Repair the poor contact of ECM connector.

No

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary open or short circuit of harness or temporary poor contact of connector may be the cause.

3. CHECK POWER SUPPLY TO LEAK CHECK VALVE ASSEMBLY.



Measure the voltage between the leak check valve assembly connector and engine ground.

Connector & terminal

(R400) No. 5 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

Repair the power supply circuit.

4. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the leak check valve assembly.
3. Disconnect the connector from ECM.
4. Measure the resistance between leak check valve assembly and chassis ground.

Connector & terminal

(R400) No. 1 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit to ground in harness between ECM and leak check valve assembly connector.

5. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.



Measure the resistance of harness between ECM and the leak check valve assembly connector.

Connector & terminal

(B134) No. 27 — (R400) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 6.](#)

No

repair the harness and connector.


Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and the leak check valve assembly connector**
- **Poor contact of coupling connector**

6. CHECK LEAK CHECK VALVE ASSEMBLY.



Check the switching valve of the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly>INSPECTION >CHECK SWITCHING VALVE.](#)

Is the switching valve of the leak check valve assembly OK?



Yes

Repair the poor contact in the leak check valve assembly connector.

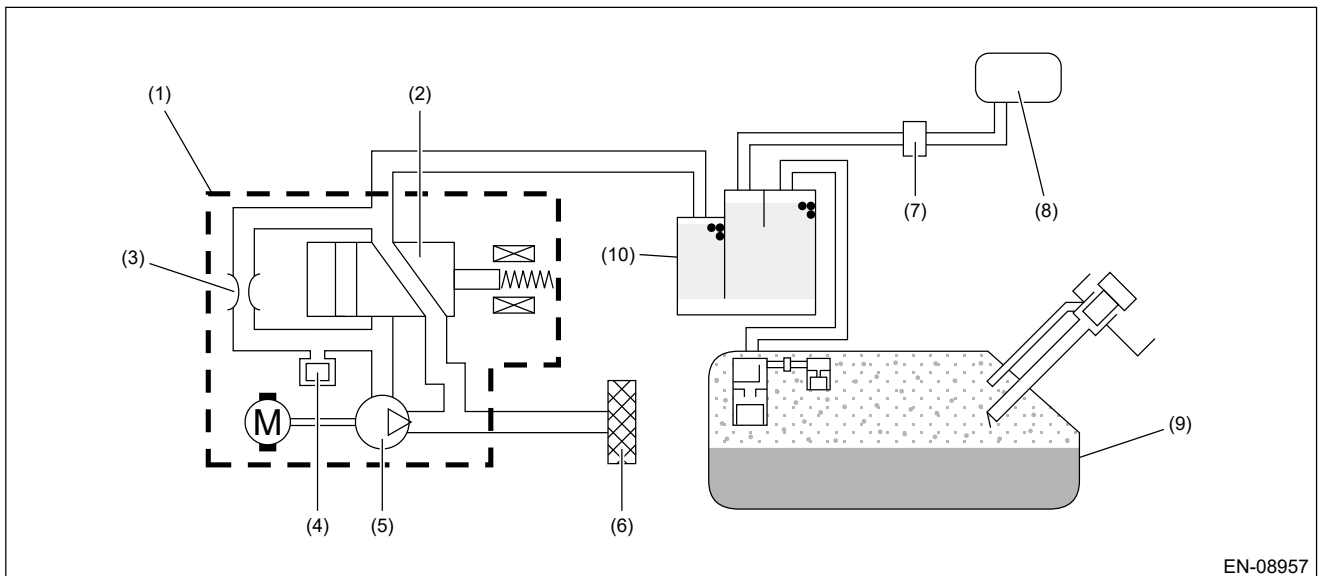
No

Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the leak check valve assembly switching valve.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



- | | | |
|---|----------------------------------|---------------|
| (1) Leak check valve ASSY | (5) Vacuum pump | (9) Fuel tank |
| (2) Switching valve | (6) Drain filter | (10) Canister |
| (3) Reference orifice (0.02 inch orifice) | (7) Purge control solenoid valve | |
| (4) Pressure sensor | (8) Intake manifold | |

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Evaporative Leak Check Module switching valve drive signal	OFF

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	$\leq 2.2 \text{ V}$

Time needed for diagnosis: 2500 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2420 EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT HIGH

DTC detecting condition:

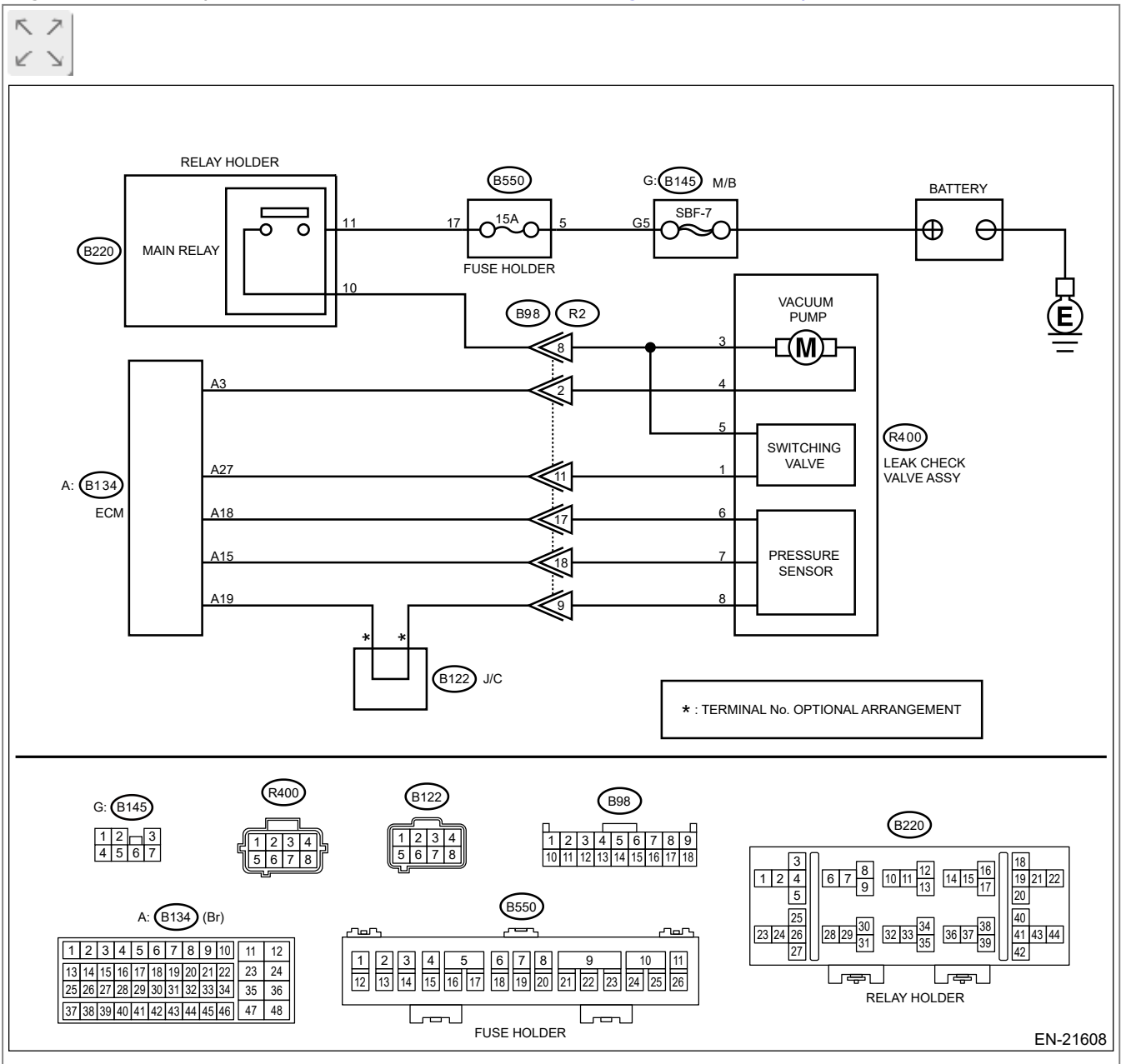
Immediately at fault recognition

Caution:

- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the leak check valve assembly.
3. Turn the ignition switch to ON.
4. Measure the voltage between leak check valve assembly and chassis ground.

Connector & terminal


(R400) No. 1 (+) – Chassis ground (-):

Is the voltage 10 V or more?

Yes


Repair the short circuit to power in harness between ECM and leak check valve assembly connector.

No

 [Go to 2.](#)

2. CHECK LEAK CHECK VALVE ASSEMBLY.




1. Turn the ignition switch to OFF.
2. Check the switching valve of the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly>INSPECTION > CHECK SWITCHING VALVE.](#)

Is the switching valve of the leak check valve assembly OK?

Yes

Repair the poor contact in the leak check valve assembly connector.

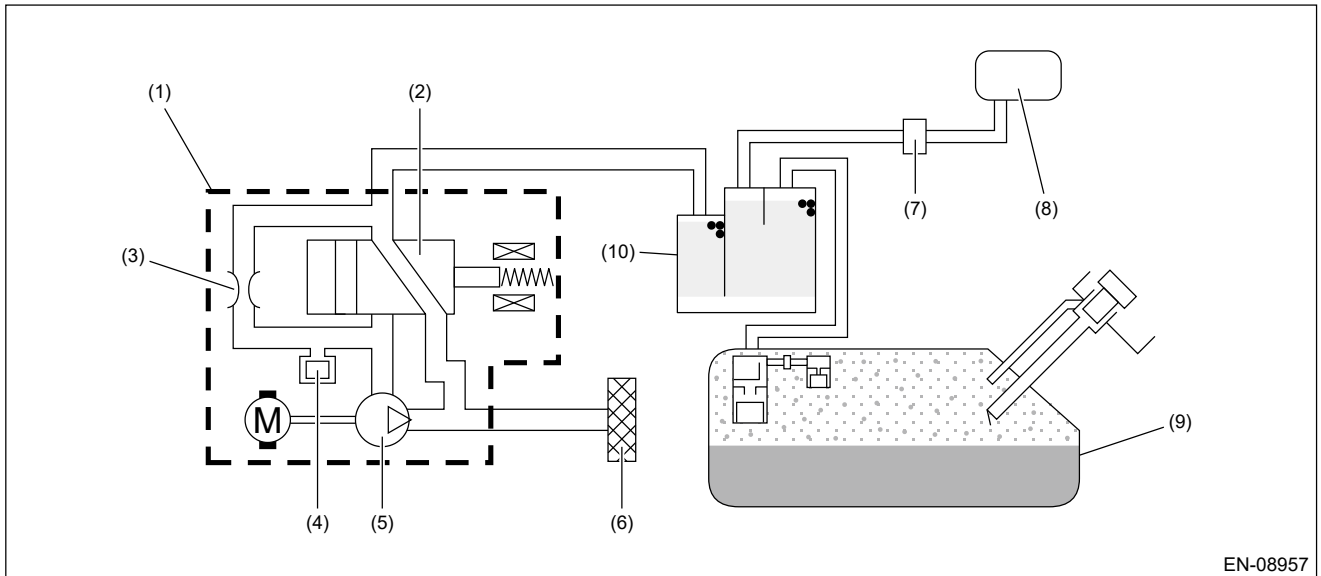
No

Replace the leak check valve assembly.  [Ref. to EMISSION CONTROL \(AUX. EMISSION CONTROL DEVICES\)\(H4DOTC\)>Leak Check Valve Assembly.](#)

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the leak check valve assembly switching valve.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



- | | | |
|---|----------------------------------|---------------|
| (1) Leak check valve ASSY | (5) Vacuum pump | (9) Fuel tank |
| (2) Switching valve | (6) Drain filter | (10) Canister |
| (3) Reference orifice (0.02 inch orifice) | (7) Purge control solenoid valve | |
| (4) Pressure sensor | (8) Intake manifold | |

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Evaporative Leak Check Module switching valve drive signal	ON

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output current	≥ 5 A

Time needed for diagnosis: 2250 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2530 IGNITION SWITCH RUN POSITION CIRCUIT



DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

Improper idling

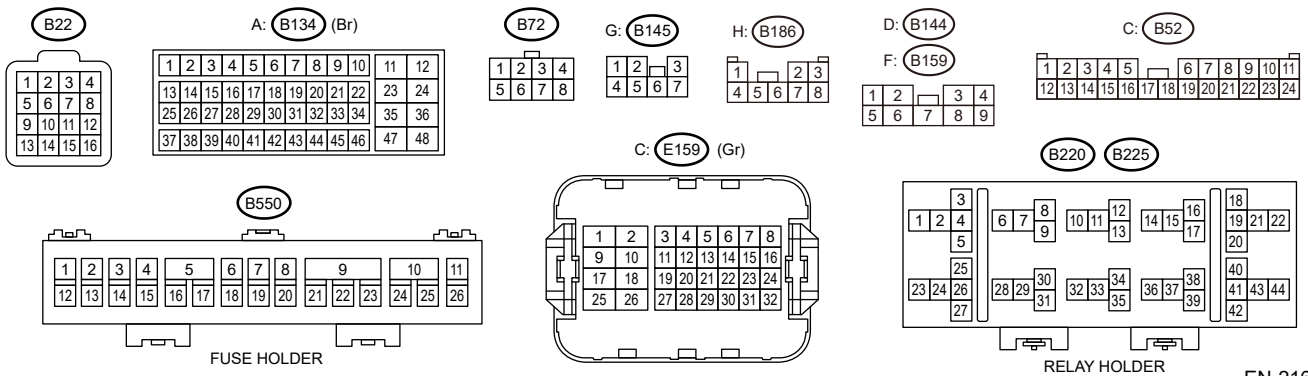
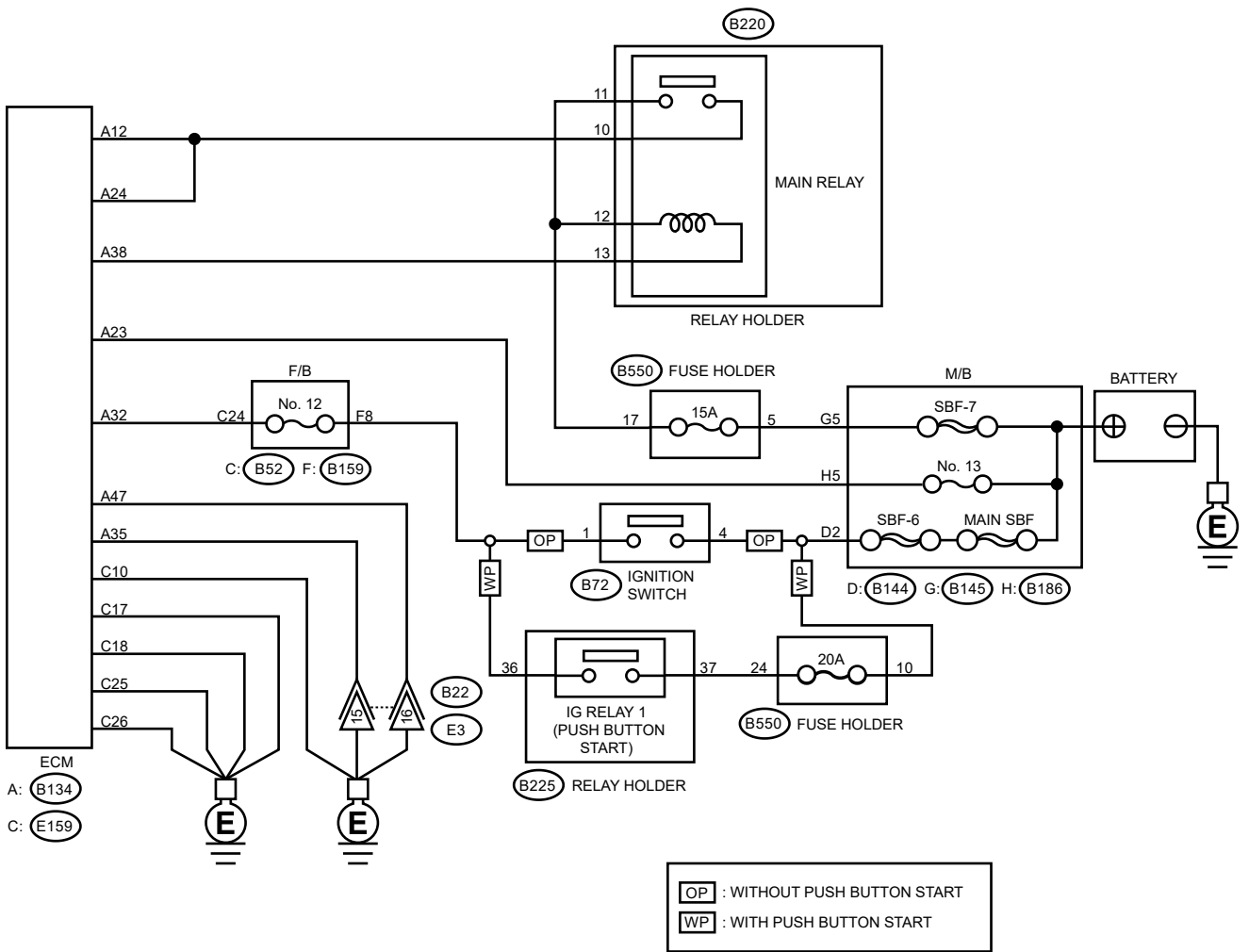
Caution:

- After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#) and Inspection Mode  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode..](#)
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





EN-21611

1. CHECK ECM CONNECTOR.

Check the connecting condition of ECM connector.

Is the ECM connector correctly connected?



Go to 2.



Yes

No

Connect the ECM connector correctly.

2. CHECK INPUT VOLTAGE OF ECM.

1. Turn the ignition switch to ON.
2. Connect the check board.

ST 18460AA030 CHECK BOARD

3. Measure the voltage between ECM connector and engine ground while wiggling the harness between ECM connector and ignition switch connector (for models without push button start), or between ECM connector and IG relay 1 (push button start) connector (for models with push button start).

Connector & terminal

(B134) No. 32 (+) — Engine ground (-):

Is the voltage 8 V or more all the time?

Yes

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, the following items may be the cause of fault.

Model without push button start

- Open circuit or short circuit to ground in harness between ECM connector and ignition switch connector
- Poor contact of ignition switch connector
- Poor contact of ignition switch

Model with push button start

- Open circuit or short circuit to ground in harness between ECM connector and IG relay 1 (push button start) connector
- Poor contact in IG relay 1 (push button start) connector
- Poor contact in IG relay 1 (push button start)

No

repair the harness and connector.

Note:

In this case, repair the following item:

Model without push button start

- Open circuit or short circuit to ground in harness between ECM connector and ignition switch connector
- Poor contact of ignition switch connector
- Poor contact of ignition switch
- Faulty fuse (F/B No. 12)

Model with push button start

- Open circuit or short circuit to ground in harness between ECM connector and IG relay 1 (push button start) connector
- Poor contact in IG relay 1 (push button start) connector
- Poor contact in IG relay 1 (push button start)
- Faulty fuse (F/B No. 12)

1. OUTLINE OF DIAGNOSIS

Detect instantaneous open in ignition switch input circuit to ECM.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION

ECM monitors the voltage of the ignition switch input circuit. Judge as ignition switch ON when the voltage is the specified value or more.

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V
Engine speed	≥ 475 rpm

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established within the predetermined time.

Judgment value

Malfunction Criteria	Threshold Value
Number of instantaneous opens in ignition switch input circuit	≥ 5 times

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.



ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2610 ECM/PCM ENGINE OFF TIMER PERFORMANCE

DTC detecting condition:



Detected when two consecutive driving cycles with fault occur.

Caution:

After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode>OPERATION. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode>PROCEDURE..

1. CHECK FOR ANY OTHER DTC ON DISPLAY.

Is any other DTC displayed?

- Yes Check DTC using "List of Diagnostic Trouble Code (DTC)".  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>List of Diagnostic Trouble Code (DTC).
- No Replace the ECM.  Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).

Note:

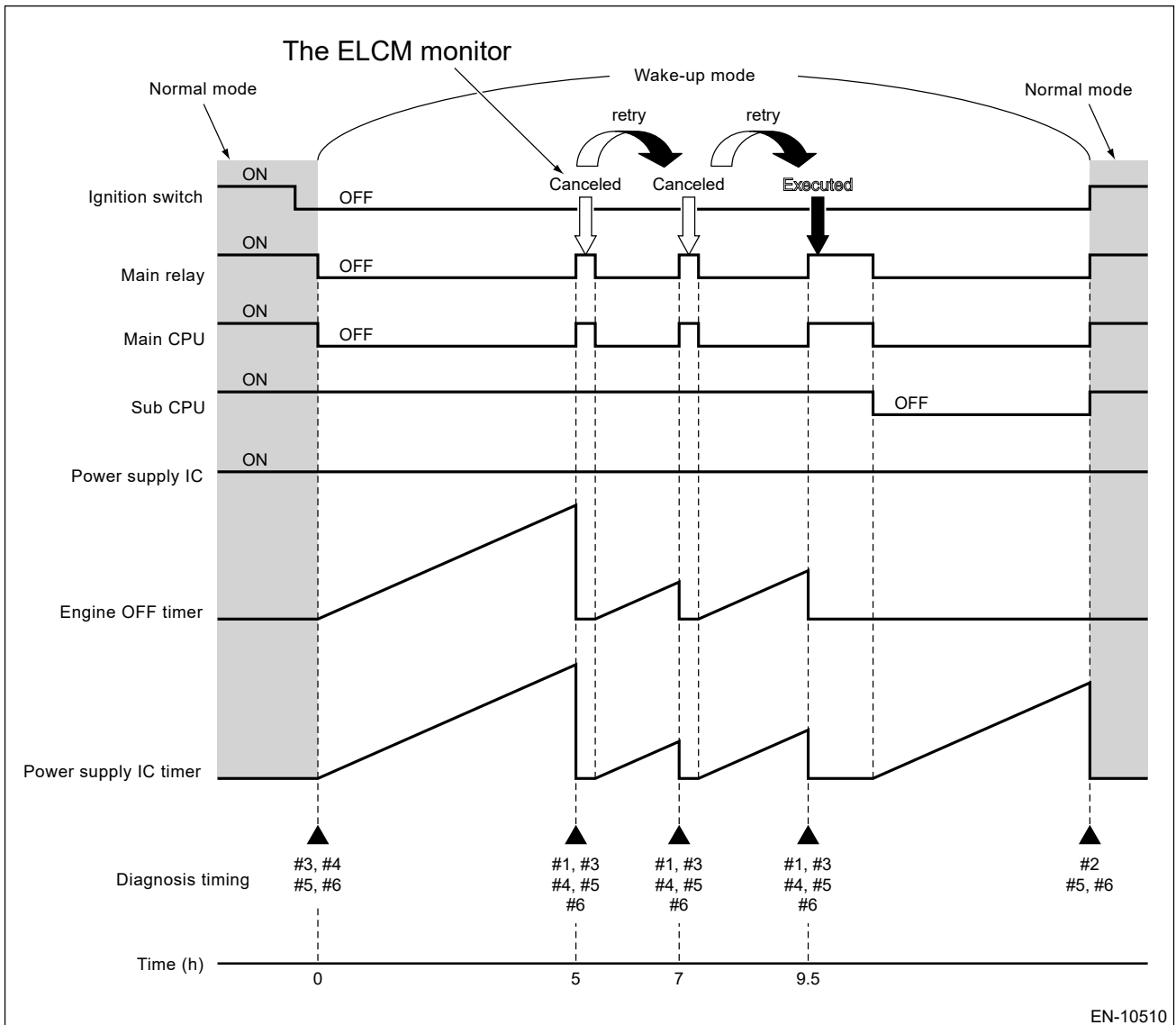
The soak timer IC is built into the ECM.

1. OUTLINE OF DIAGNOSIS

Confirm the engine off timer accuracy by comparing engine off timer and power supply IC timer after ignition switch is turned to OFF.

This diagnosis consists of the following six cases. Judge as NG when in any one of the following cases, abnormality is detected.

Case number	Diagnosis function	Time needed for diagnosis:
Case #1	Diagnose the difference between wake-up request time and power supply IC timer.	Less than 1 second
Case #2	Diagnose the time in power supply IC timer before wake up.	Less than 1 second
Case #3	Diagnose the communication error between main CPU and sub CPU.	2 s
Case #4	Diagnose the communication error between main CPU and power supply IC.	2 s
Case #5	Diagnose the operation status abnormality in main CPU and sub CPU.	2 s
Case #6	Diagnose the ignition switch status abnormality in main CPU and sub CPU.	2 s



Note:

- Normal mode: main relay and ignition switch is ON.
- Wake-up mode: In soaking

2. COMPONENT DESCRIPTION

The engine off timer is built into the ECM.

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
<Case #1>	
Battery voltage	≥ 10.9 V
Main CPU	Wake-up mode
<Case #2>	
Battery voltage	≥ 10.9 V
Main CPU	Normal mode

Wake-up experience flag	OFF
<Case #3, #4, #5 and #6>	
Battery voltage	≥ 10.9 V

4. GENERAL DRIVING CYCLE

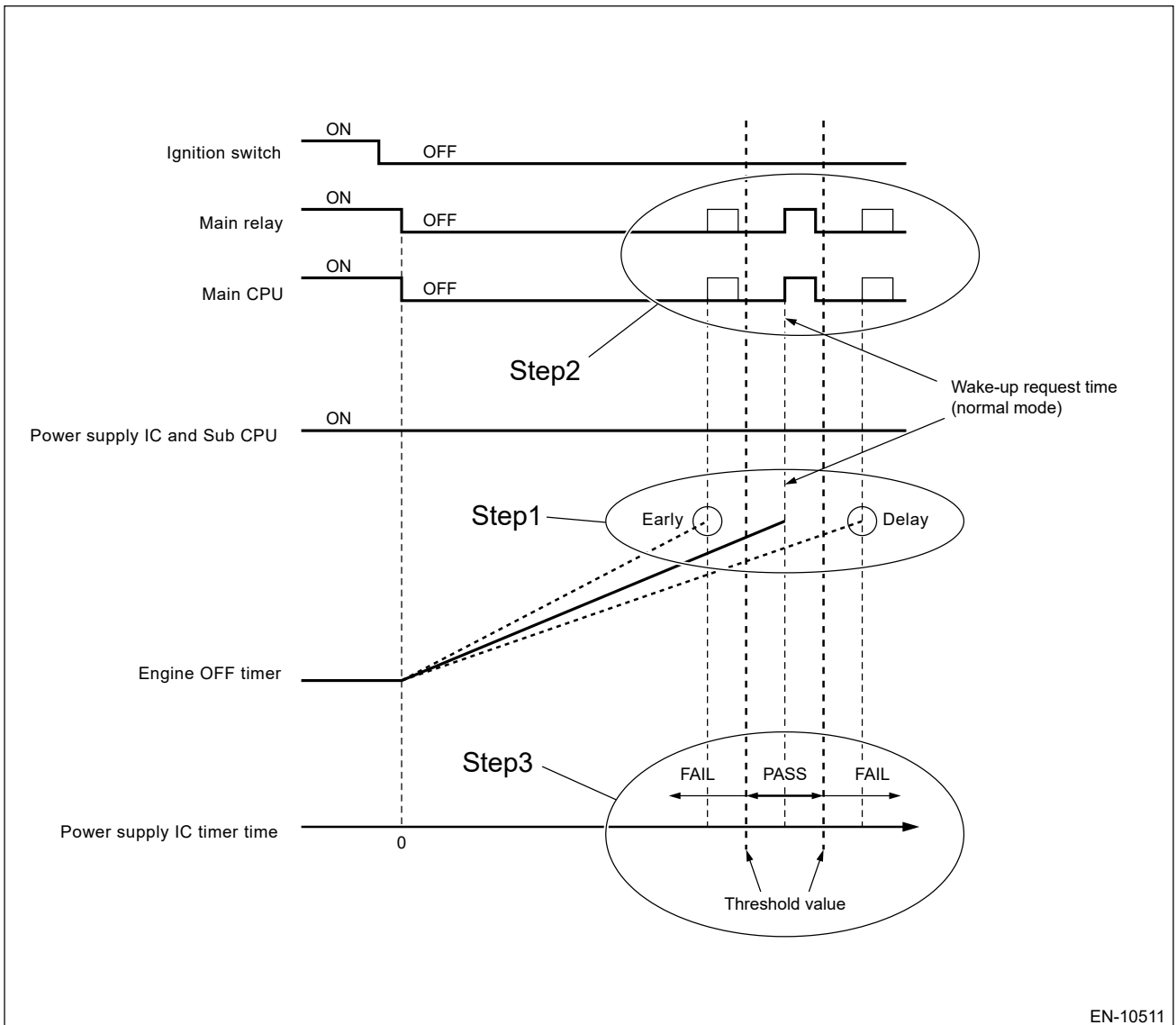
- **Case #1:** Perform the diagnosis only once when wake-up operates after the ignition switch is OFF.
- **Case #2:** Perform the diagnosis only once when the following driving cycle starts after the ignition switch is OFF.
- **Case #3:** Perform the diagnosis only once after the enable conditions have been established.
- **Case #4:** Perform the diagnosis only once after the enable conditions have been established.
- **Case #5:** Perform the diagnosis only once after the enable conditions have been established.
- **Case #6:** Perform the diagnosis only once after the enable conditions have been established.

5. DIAGNOSTIC METHOD

<CASE #1>

Judge as abnormal in engine off timer or power supply IC timer when the difference between wake-up request time and power supply IC timer exceeds the threshold value.

When the sub CPU is faulty, wake-up timing is either advancing or retarding compared with normal timing.



EN-10511

Processed in order Step 1 through Step 3.

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
$ (Power\ supply\ IC\ timer) - (Wake-up\ request\ time) / Wake-up\ request\ time$	> 0.24

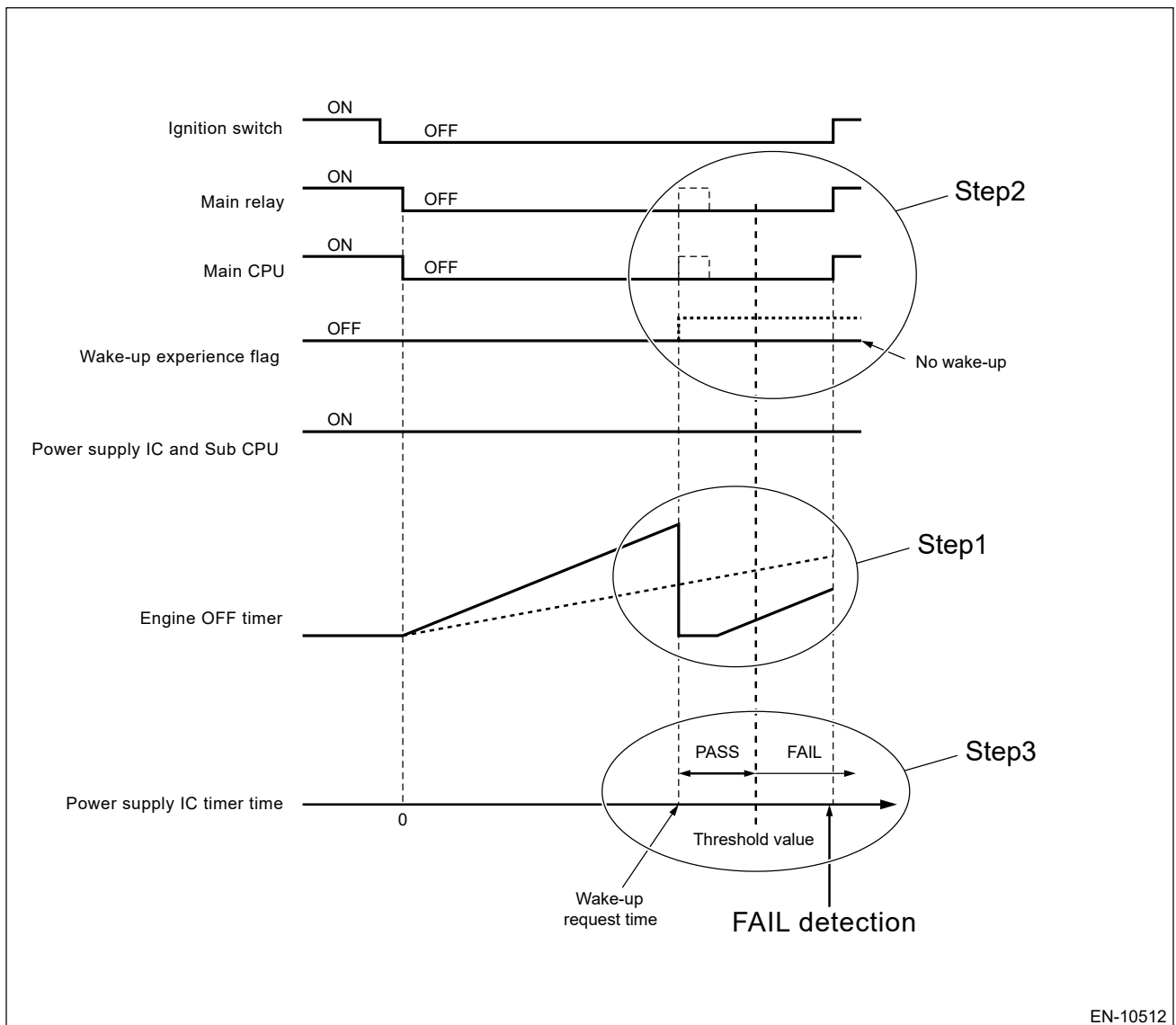
Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

<CASE #2>

Judge as abnormal in engine off timer when the power supply IC timer exceeds the wake-up request time before wake up.

When case #1 is not performed, perform case #2.



EN-10512

Processed in order Step 1 through Step 3.

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
{(Power supply IC timer) – (Wake-up request time)} / Wake-up request time	> 0.24

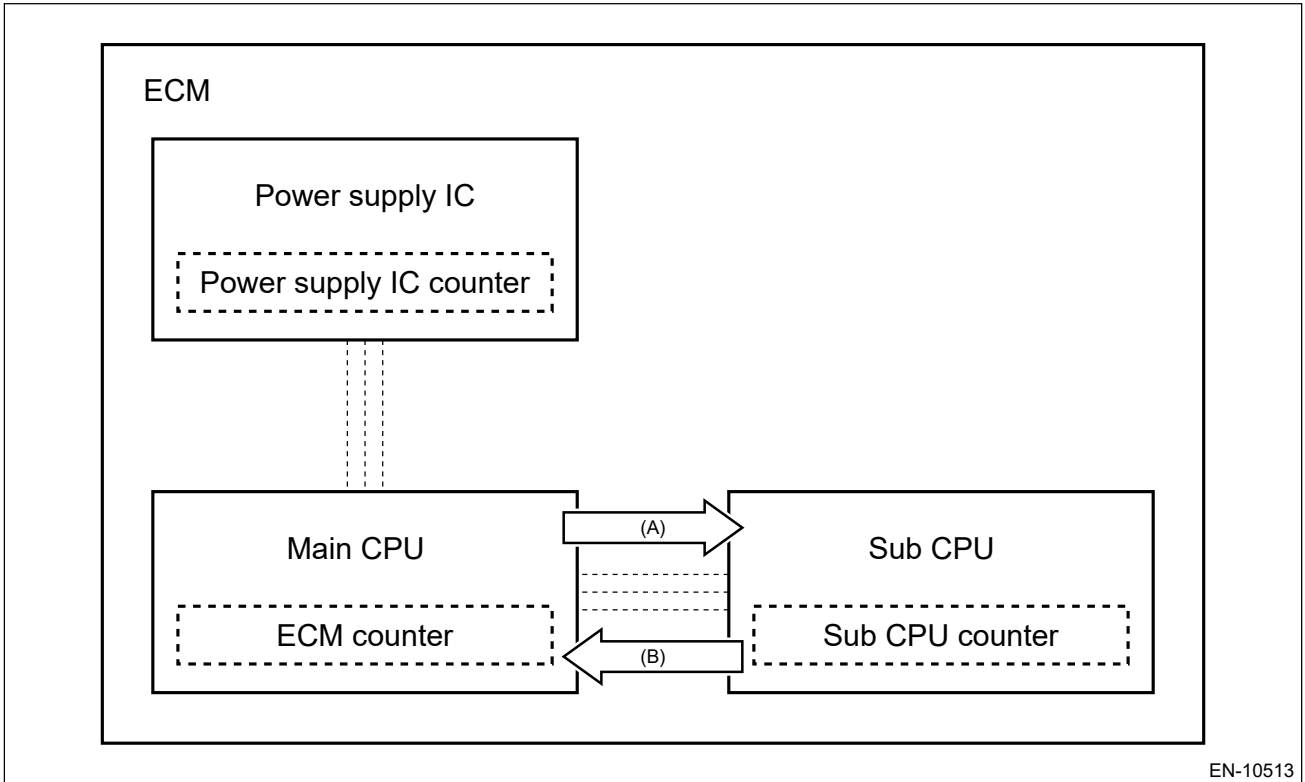
Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

<CASE #3>

Diagnose the communication error between main CPU and sub CPU.

Judge as NG when the wake-up time required from main CPU and the wake-up time received from sub CPU are different.



EN-10513

- (A) Main CPU demands wake-up time to sub CPU.
- (B) Sub CPU sends back wake-up time required by main CPU.

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Wake-up time required by main CPU	≠ Wake-up time sent back by sub CPU

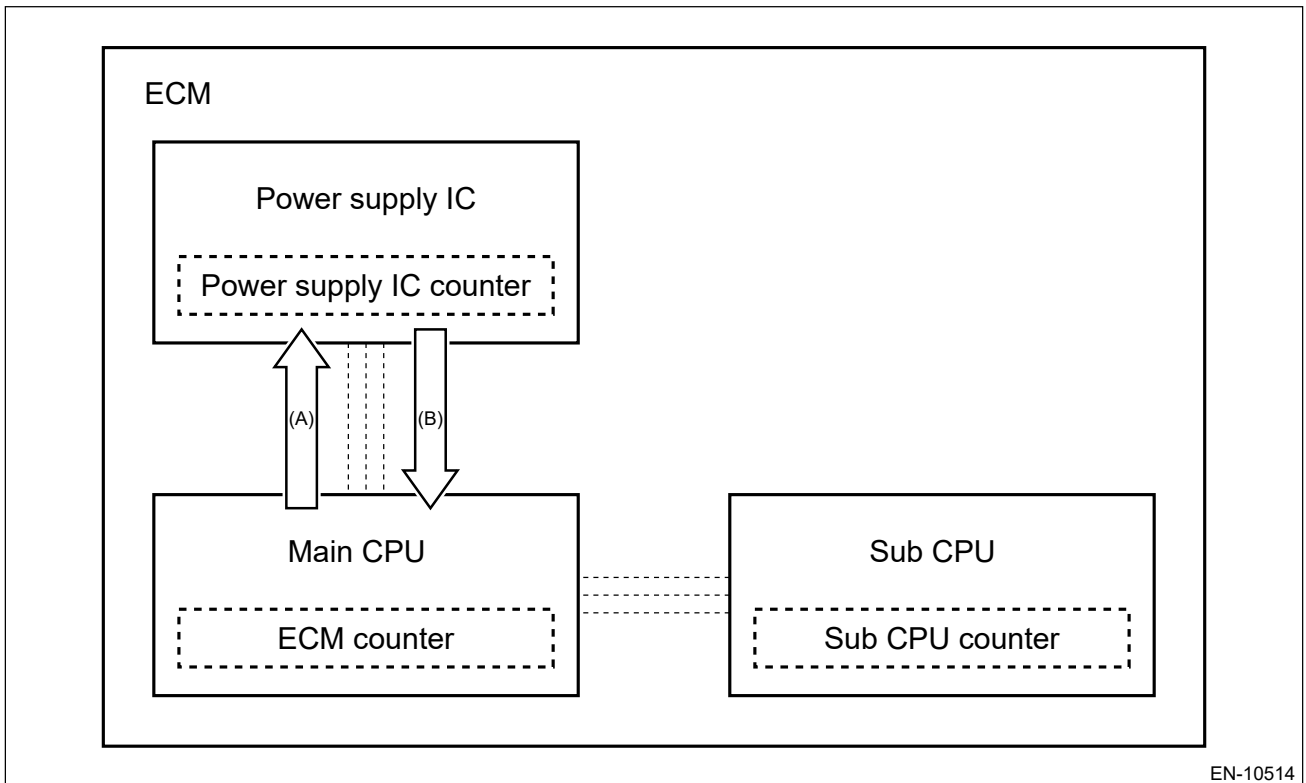
Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

<CASE #4>

Diagnose the communication error between main CPU and power supply IC.

Judge as NG when the signal required by main CPU and the signal received from power supply IC are different.



EN-10514

- (A) Main CPU demands signals for measuring the wake-up time to power supply IC.
- (B) Main CPU receives signals for measuring the wake-up time from power supply IC.

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Signal required by main CPU	≠ Signal received from power supply IC

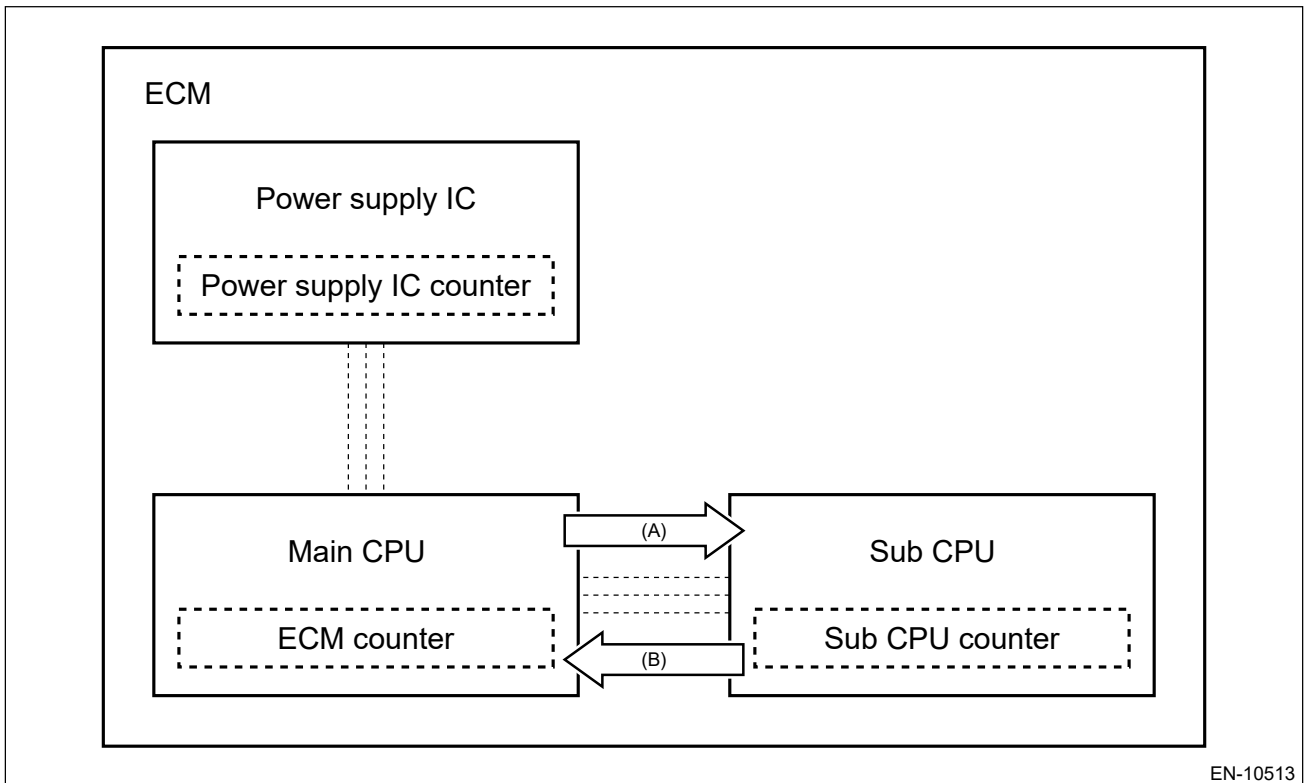
Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

<CASE #5>

On main CPU and sub CPU, there are two operation status: "normal mode" and "wake-up mode". Perform diagnosis for CPU operation status abnormality by detecting the difference in operating status of main CPU and sub CPU.

Judge as NG when main CPU and sub CPU is different in operating status.



EN-10513

- (A) Main CPU demands diagnosis for operating status to sub CPU.
- (B) Sub CPU sends back the operating status to main CPU.

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Operating status of main CPU	≠ Operating status of sub CPU

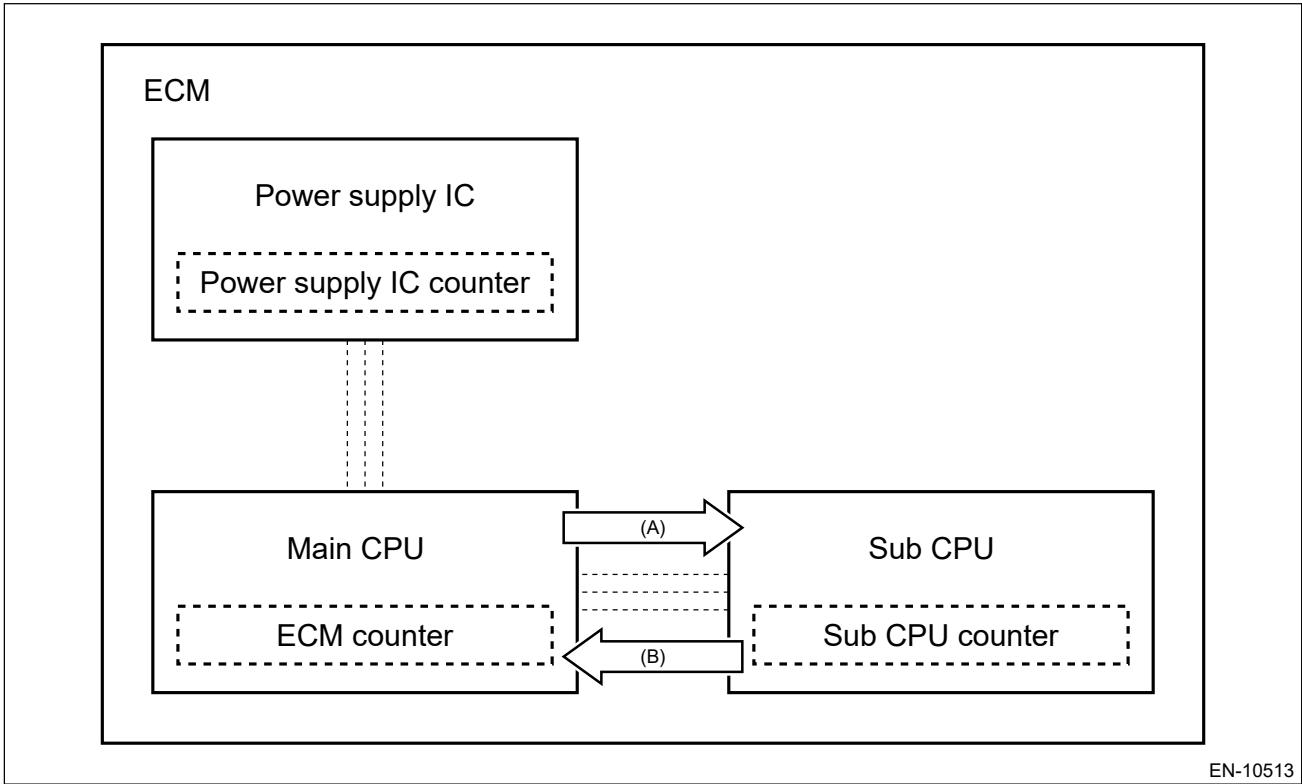
Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

<CASE #6>

Perform diagnosis for ignition switch status abnormality by detecting the difference in ignition switch status (ON or OFF) of main CPU and sub CPU.

Judge as NG when main CPU and sub CPU are different in ignition switch status.



EN-10513

- (A) Main CPU demands ignition switch status to sub CPU.
- (B) Sub CPU sends back ignition switch status to main CPU.

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Ignition switch status of main CPU	≠ Ignition switch status of sub CPU

Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS "A" OFF

Note:

For the diagnostic procedure, refer to LAN section.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS

Detect malfunction of CAN communication.

Judge as NG when CAN communication failure has occurred.

2. COMPONENT DESCRIPTION

(Common Specifications)

CAN Protocol 2.0B (Active)

Frame Format: 11 Bit ID Frame (Standard Frame)

Conforms to ISO11898

Communication Speed: 500 kbps

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after starting the engine.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
CAN bus condition	Bus off

Time needed for diagnosis: 436 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM

Note:

For the diagnostic procedure, refer to LAN section.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS

Detect malfunction of CAN communication.

Judge as NG when data received from TCM, VDC, CM and combination meter is not normal.

2. COMPONENT DESCRIPTION

(Common Specifications)

CAN Protocol 2.0B (Active)

Frame Format: 11 Bit ID Frame (Standard Frame)

Conforms to ISO11898

Communication Speed: 500 kbps

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after starting the engine.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
ID received from control module connected to CAN	None

Time needed for diagnosis: 500 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

Note:

For the diagnostic procedure, refer to LAN section.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC U0101.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC U0101 LOST COMMUNICATION WITH TCM.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

Note:

For the diagnostic procedure, refer to LAN section.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC U0101.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC U0101 LOST COMMUNICATION WITH TCM.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0402 INVALID DATA RECEIVED FROM TCM

Note:

For the diagnostic procedure, refer to LAN section.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS

Detect malfunction of CAN communication.

Judge as NG when data received from TCM, VDC, CM and combination meter is not normal.

2. COMPONENT DESCRIPTION

(Common Specifications)

CAN Protocol 2.0B (Active)

Frame Format: 11 Bit ID Frame (Standard Frame)

Conforms to ISO11898

Communication Speed: 500 kbps

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
Battery voltage	≥ 10.9 V

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after starting the engine.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Data updated from control module connected to CAN	None

Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

Note:

For the diagnostic procedure, refer to LAN section.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC U0402.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC U0402 INVALID DATA RECEIVED FROM TCM.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE

Note:

For the diagnostic procedure, refer to LAN section.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC U0402.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC U0402 INVALID DATA RECEIVED FROM TCM.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure without Diagnostic Trouble Code (DTC)

CHECK BRAKE OVERRIDE SYSTEM

Caution:

Perform this test in a location where the driving can be checked safely, while paying sufficient attention to the vicinity. While driving, the traffic laws and regulations such as speed limit must always be observed.

Note:


- The value of [Accel. Opening Angle] on the data monitor normally changes according to the value of accelerator sensor No. 1 voltage ratio. (The values do not become the same. Refer to ES-41 for the values)
- Even if the voltage difference between [Accel. Opening Angle] and the accelerator sensor No. 1 is large and the value of [Accelerator Pedal Angle] is not consistent, the corresponding control can be considered to be activated if the value of the accelerator sensor No. 1 voltage ratio is consistent. (Use of the data storage function of Subaru Select Monitor 4 allows the data during driving to be stored. The stored data can be checked after the driving.)
- When the customer complains of deceleration feeling when he/she intentionally depresses both the accelerator pedal and the brake pedal, advise them not to depress both pedals. (Example: operating the brake pedal with the left foot while operating the accelerator pedal)

1. CHECK DTC.

Check for DTC.


1. Connect Subaru Select Monitor 4 to data link connector.
2. Turn the ignition switch to ON.
3. Turn the Subaru Select Monitor 4 to ON.
4. Check for the DTCs of the system that may be output.

Note:

- **Subaru Select Monitor**
Refer to "Read Diagnostic Trouble Code (DTC)" for detailed operation procedure.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

Is there any DTC output?

Yes

Check DTC using "List of Diagnostic Trouble Code (DTC)".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 2.](#)

2. READ DATA MONITOR.



Using the Subaru Select Monitor, read the value in [Stop Light Switch].

Note:

- For detailed operation procedures, refer to the "Data Monitor". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

Is the value of [Stop Light Switch] changed to ON/OFF on the data monitor?

Yes

[Go to 3.](#)

No

Check the stop light circuit.

3. CHECK BRAKE PEDAL.



Check the brake pedal.

Is the brake pedal OK?

Yes

[Go to 4.](#)

No

Adjust or replace the brake pedal. [Ref. to BRAKE>Brake Pedal.](#)

4. READ DATA MONITOR.



Using the Subaru Select Monitor, read the values in [Accelerator Pedal Pos.#1] and [Accelerator Pedal Pos.#2] when operating the accelerator pedal from fully closed to fully open.

Note:

- For detailed operation procedures, refer to the "Data Monitor". [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

Does the values of [Accelerator Pedal Pos.#1] and [Accelerator Pedal Pos.#2] continuously change?

Yes

[Go to 5.](#)

No

Replace the throttle opening angle sensor. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Throttle Body.](#)

5. READ DATA MONITOR.

Using Subaru Select Monitor, read the value of [Vehicle Speed] when driving at a constant speed of 16.1 Km/h (10MPH) or 64.4 Km/h (40MPH).

Caution:


During the driving test, the traffic laws and regulations such as speed limit must always be observed.

Note:

- **Use of the data storage function of Subaru Select Monitor 4 allows the data during driving to be stored. The stored data can be checked after the driving.**

Does the value of [Vehicle Speed] change widely?

Yes

Check the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

No

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure without Diagnostic Trouble Code (DTC)

CHECK SI-DRIVE (SUBARU INTELLIGENT DRIVE) SYSTEM

Diagnosis:

SI-DRIVE mode does not switch.

Caution:

Note that SI-DRIVE system operates the following controls when it switches the modes.

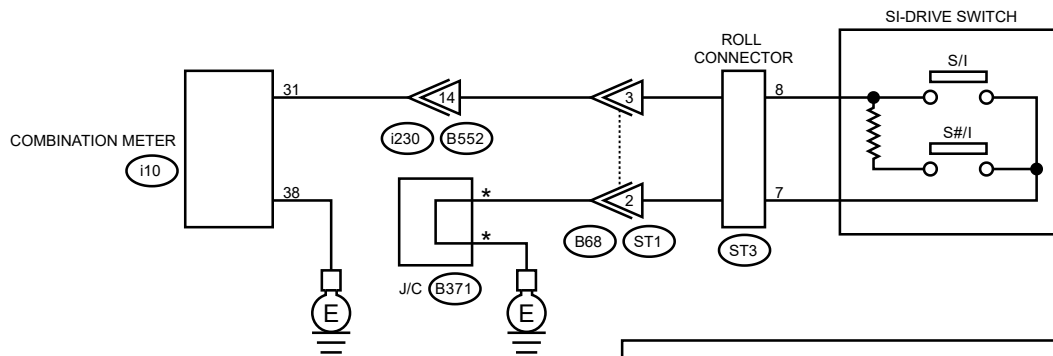
- 1. When the engine is cold, the low coolant temperature display will light in the combination meter. In this case, it cannot switch to S# (Sport Sharp), S# (Sport Sharp) switch prohibition buzzer sounds.**
- 2. When turning the engine OFF and then ON again, it switches to I (intelligent) mode although in the mode prior to engine OFF.**
- 3. Switches to S (Sport) when the malfunction indicator light illuminates while the engine is running. In this case, it cannot switch to S# (Sport Sharp) or I (Intelligent) mode.**
- 4. If there is a possible engine coolant or engine oil temperature overheat condition, it will not be possible to switch to the S# (Sport Sharp) mode. Switches to S (Sport) while driving in S# (Sport Sharp) mode.**

1. SI-DRIVE MODE INDICATION DOES NOT CHANGE AND MODES DO NOT SWITCH AFTER SWITCHING SI-DRIVE MODES

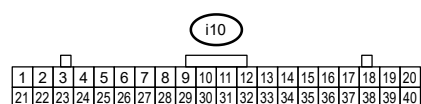
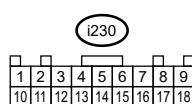
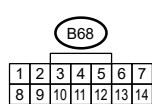
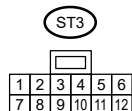
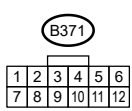
Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





* : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 1, 2, 3, 4, 5 AND 6



EN-10532

1. CHECK SI-DRIVE SWITCH.



1. Turn the ignition switch to OFF.
2. Disconnect the connector from the combination meter.
3. Measure the resistance when the SI-DRIVE switch is operated.

Connector & terminal

(i10) No. 31 — Chassis ground:

Does the resistance change as below?

S#/I: 1.71 — 1.89 kΩ

S/I: less than 1 Ω

Yes

[Go to 5.](#)

No

[Go to 2.](#)

2. CHECK HARNESS BETWEEN COMBINATION METER AND SI-DRIVE SWITCH CONNECTOR.




Measure the resistance of harness between combination meter connector and SI-DRIVE switch connector.

Connector & terminal

(i10) No. 31 — (ST3) No. 8:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between combination meter connector and SI-DRIVE switch connector**
- **Poor contact of coupling connector**
- **Poor contact of roll connector**
- **Roll connector is faulty**

3. CHECK HARNESS BETWEEN SI-DRIVE SWITCH CONNECTOR AND CHASSIS GROUND.

Measure the resistance of harness between SI-DRIVE switch connector and chassis ground.

Connector & terminal

(ST3) No. 7 — Chassis ground:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between SI-DRIVE switch connector and chassis ground**
- **Poor contact of joint connector**
- **Poor contact of roll connector**
- **Roll connector is faulty**

4. CHECK HARNESS BETWEEN COMBINATION METER AND SI-DRIVE SWITCH CONNECTOR.


Measure the resistance between combination meter connector and chassis ground.

Connector & terminal

(i10) No. 31 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

Repair the poor contact of SI-DRIVE switch connector. Replace the SI-DRIVE switch if defective.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>SI-DRIVE \(SUBARU Intelligent Drive\) Selector.](#)

No

Repair the short circuit to ground in harness between combination meter and SI-DRIVE switch connector.

5. CHECK HARNESS BETWEEN COMBINATION METER AND CHASSIS GROUND.

Measure the resistance of harness between combination meter and chassis ground.

Connector & terminal

(i10) No. 38 — Chassis ground:

Is the resistance less than 5 Ω?

Yes

 [Go to 6.](#)

No


Repair the open circuit of harness between combination meter and chassis ground.

6. RECHECK FAULT.

1. Connect all connectors.
2. Switch SI-DRIVE modes.

Is there any fault?

Yes

Repair the poor contact of combination meter connector. Replace the meter case assembly if defective.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

No

The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. WHEN THE SI-DRIVE MODE IS CHANGED, "S", "I" OR "S#" FLASHES IN COMBINATION METER SI-DRIVE MODE DISPLAY IN APPROX. 5 SECONDS

1. CHECK DTC.

Are any DTCs displayed?

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)" concerning the respective units.

No

 [Go to 2.](#)

2. CHECK COMBINATION METER AND CLOCK DISPLAY.


Check for abnormal display other than "S", "I" or "S#" flashing.

Examples:

- Malfunction indicator light illuminates.
- Fuel economy display area is not ON.

Is there an abnormal display other than "S", "I" or "S#" flashing?

Yes

For the diagnostic procedure, refer to LAN section.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)


No

 [Go to 3.](#)



3. CHECK ECM AND COMBINATION METER.

Is the part number of ECM and combination meter correct?

Yes

Replace the meter case assembly.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

No

Replace ECM or meter case assembly with the one with the correct part number.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

3. WHEN THE SI-DRIVE MODE IS CHANGED, "S", "I" OR "S#" FLASHES IN COMBINATION METER SI-DRIVE MODE DISPLAY

Note:

In this case, there is a fault other than in SI-DRIVE system.


1. CHECK MALFUNCTION INDICATOR LIGHT.

1. Start the engine.

2. Check if malfunction indicator light illuminates.

Does the malfunction indicator light illuminate?

Yes

Read the DTC using Subaru Select Monitor and check the indicated DTC.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 2.](#)

2. CHECK COOLANT TEMPERATURE WARNING LIGHT.

1. Turn the ignition switch to ON.
2. Check the coolant temperature warning light.

Does it indicate overheating?

Yes

Inspect for the cause of overheating and repair.


No

 [Go to 3.](#)

3. CHECK ENGINE OIL TEMPERATURE.

1. Turn the ignition switch to ON.
2. Check the value of [Engine Oil Temperature] using Subaru Select Monitor.

Note:

For detailed operation procedures, refer to "Current Data Display For Engine".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

Is the value of Engine Oil Temperature 117°C (243°F) or more?

Yes

Inspect and repair the cause of engine oil temperature rise.

Note:

Ask the customer whether the vehicle has experienced a long drive in low gear or towing of heavy load. If not, drive the vehicle again after the engine oil temperature lowers, and check if the engine oil temperature rises.

No


 [Go to 4.](#)

4. CHECK COMBINATION METER INDICATION.

- 1.** Turn the ignition switch to ON.
- 2.** Switch SI-DRIVE modes.
- 3.** Check the SI-DRIVE mode display in the combination meter.

Does the SI-DRIVE mode "S", "I" or "S#" in combination meter flash?

Yes


Replace the meter case assembly.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

No

Perform test operation and check the malfunction indicator light, engine coolant temperature warning light, and engine oil temperature. If they are normal, finish the diagnosis.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure without Diagnostic Trouble Code (DTC)



LIST

Item	Note
Check SI-DRIVE (SUBARU Intelligent Drive) system	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure without Diagnostic Trouble Code (DTC)>CHECK SI-DRIVE (SUBARU INTELLIGENT DRIVE) SYSTEM.
Check brake override system	Place the link of brake override here

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostics for Engine Starting Failure

CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM)

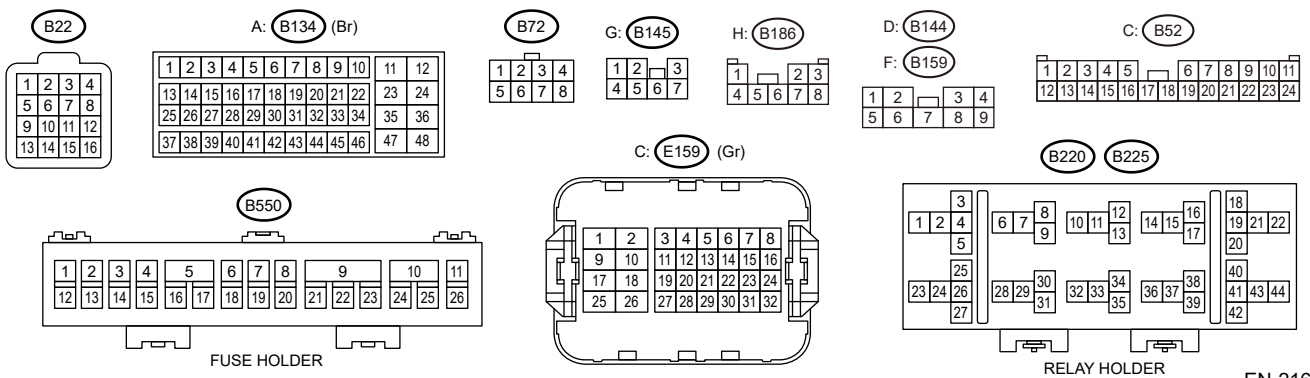
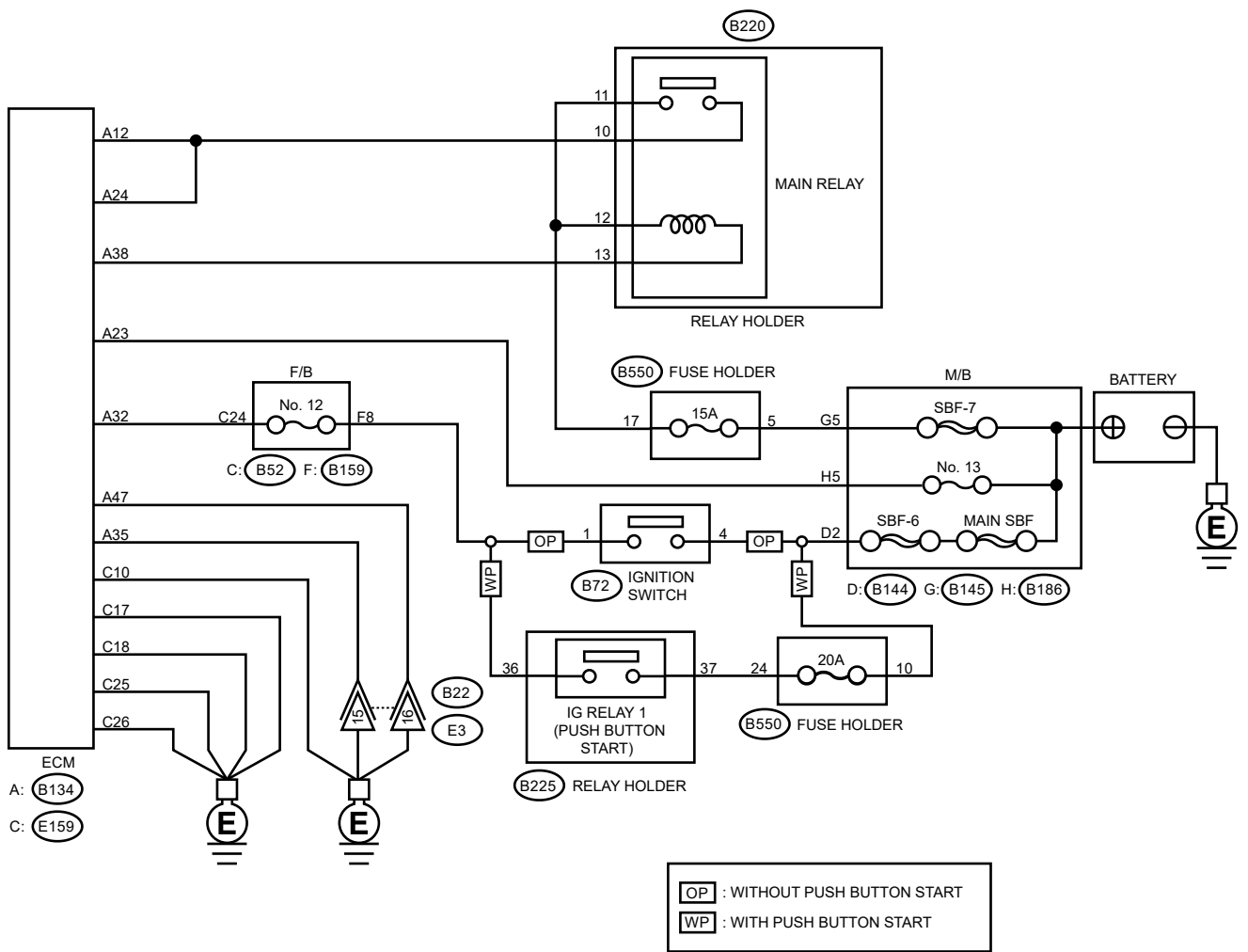
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory**  **Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode**  **Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





EN-21611

1. CHECK MAIN RELAY.


1. Turn the ignition switch to OFF.
2. Remove the main relay.
3. Connect the battery to main relay terminals No. 12 and No. 13.
4. Measure the resistance between main relay terminals.

Terminals


No. 10 — No. 11:

Is the resistance less than 1 Ω ?

Yes

 [Go to 2.](#)

No

Replace the main relay.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Main Relay.](#)

2. CHECK GROUND CIRCUIT FOR ECM.

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM and chassis ground.

Connector & terminal

(B134) No. 35 — Chassis ground:
(B134) No. 47 — Chassis ground:
(E159) No. 10 — Chassis ground:
(E159) No. 17 — Chassis ground:
(E159) No. 18 — Chassis ground:
(E159) No. 25 — Chassis ground:
(E159) No. 26 — Chassis ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 3.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and engine ground terminal**
- **Poor contact of coupling connector**

3. CHECK INPUT VOLTAGE OF ECM.


1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and chassis ground.

Connector & terminal

(B134) No. 23 (+) — Chassis ground (-):
(B134) No. 32 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

Repair the open or ground short in the harness of power supply circuit.

4. CHECK INPUT VOLTAGE OF MAIN RELAY.

Measure the voltage between main relay connector and chassis ground.


Connector & terminal

(B220) No. 11 (+) — Chassis ground (-):

(B220) No. 12 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 5.](#)

No

Repair the open or ground short in the harness of power supply circuit.

5. CHECK INPUT VOLTAGE OF ECM.


1. Turn the ignition switch to OFF.
2. Install the main relay.
3. Turn the ignition switch to ON.
4. Measure the voltage between ECM and chassis ground.

Connector & terminal

(B134) No. 38 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 6.](#)

No

Repair the open circuit in harness between ECM and main relay connector.

6. CHECK INPUT VOLTAGE OF ECM.

1. Turn the ignition switch to OFF.
2. Connect the connector to ECM.
3. Turn the ignition switch to ON.
4. Measure the voltage between ECM and chassis ground.


Connector & terminal

(B134) No. 12 (+) — Chassis ground (—):

(B134) No. 24 (+) — Chassis ground (—):

Is the voltage 10 V or more?

Yes

Check ignition control system.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostics for Engine Starting Failure>IGNITION CONTROL SYSTEM.](#)

No

repair the harness and connector.

Note:



In this case, repair the following item:

- **Open circuit in harness between ECM and main relay connector**
- **Poor contact of main relay connector**
- **Poor contact of ECM connector**

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostics for Engine Starting Failure

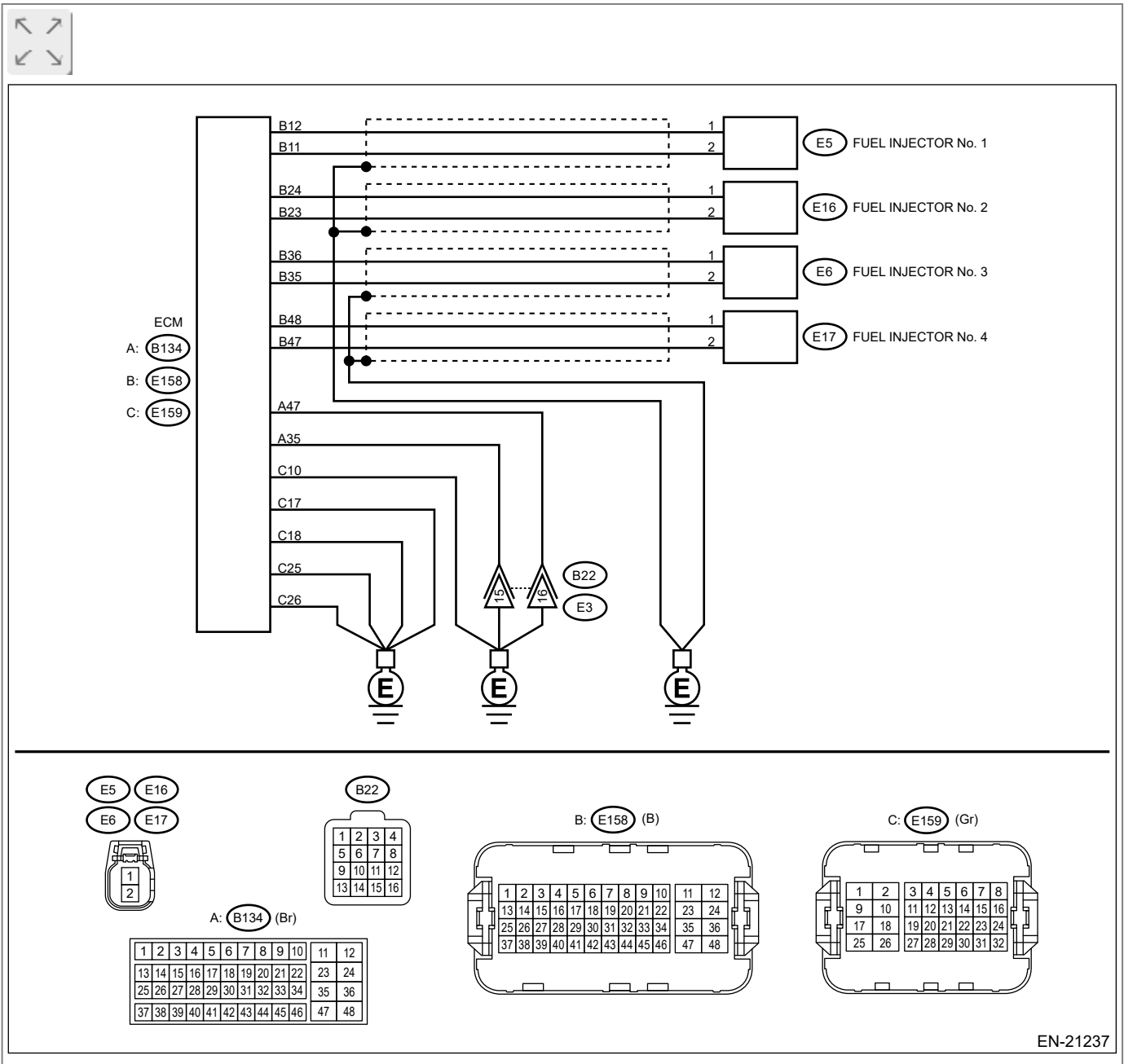
FUEL INJECTOR CIRCUIT

Caution:

- Check or repair only faulty parts.
- After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode..
- Use the check board when measuring the ECM terminal voltage and resistance.

Wiring diagram:

Engine Electrical System  Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.




1. CHECK OPERATION OF EACH FUEL INJECTOR.


While cranking the engine, check each fuel injector emits operating sound. Use a sound scope or attach a screwdriver to the injector to listen to sounds for this check.

Does the fuel injector emit operating sound?

Yes

Check the fuel pressure.  [Ref. to MECHANICAL\(H4DOTC\)>Fuel Pressure>INSPECTION.](#)

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM and fuel injector connector.

Connector & terminal

- #1 (E158) No. 12 — (E5) No. 1:
- #1 (E158) No. 11 — (E5) No. 2:
- #2 (E158) No. 24 — (E16) No. 1:
- #2 (E158) No. 23 — (E16) No. 2:
- #3 (E158) No. 36 — (E6) No. 1:
- #3 (E158) No. 35 — (E6) No. 2:
- #4 (E158) No. 48 — (E17) No. 1:
- #4 (E158) No. 47 — (E17) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit in harness between ECM and fuel injector connector.

3. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.

Measure the resistance of harness between ECM and chassis ground.


Connector & terminal

- #1 (E158) No. 12 — Chassis ground:
- #1 (E158) No. 11 — Chassis ground:

- #2 (E158) No. 24 — Chassis ground:
- #2 (E158) No. 23 — Chassis ground:
- #3 (E158) No. 36 — Chassis ground:
- #3 (E158) No. 35 — Chassis ground:
- #4 (E158) No. 48 — Chassis ground:
- #4 (E158) No. 47 — Chassis ground:

Is the resistance 1 MΩ or more?


Yes

 [Go to 4.](#)

No


Repair the short circuit to ground in harness between ECM and fuel injector connector.

4. CHECK EACH FUEL INJECTOR.


Check each fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Injector>INSPECTION.](#)

Are fuel injectors OK?

Yes

 [Go to 5.](#)

No

Replace the faulty fuel injector.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel Injector.](#)

5. CHECK FOR POOR CONTACT.


Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes



Repair the poor contact of ECM connector.

No

Inspection using "General Diagnostic Table".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>General Diagnostic Table>INSPECTION.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostics for Engine Starting Failure
FUEL PUMP CIRCUIT


Caution:

After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode>OPERATION.](#) and Inspection Mode  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Inspection Mode>PROCEDURE.](#)

1. CHECK OPERATING SOUND OF FUEL PUMP. 


Make sure that the fuel pump operates for two seconds when turning the ignition switch to ON.

Note:


Fuel pump operation can be executed using Subaru Select Monitor.
Refer to "Active Test" for the procedures.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Active Test.](#)

Does the fuel pump emit operating sound?

Yes

Check the fuel injector circuit.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostics for Engine Starting Failure>FUEL INJECTOR CIRCUIT.](#)

No

Display the DTC.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostics for Engine Starting Failure

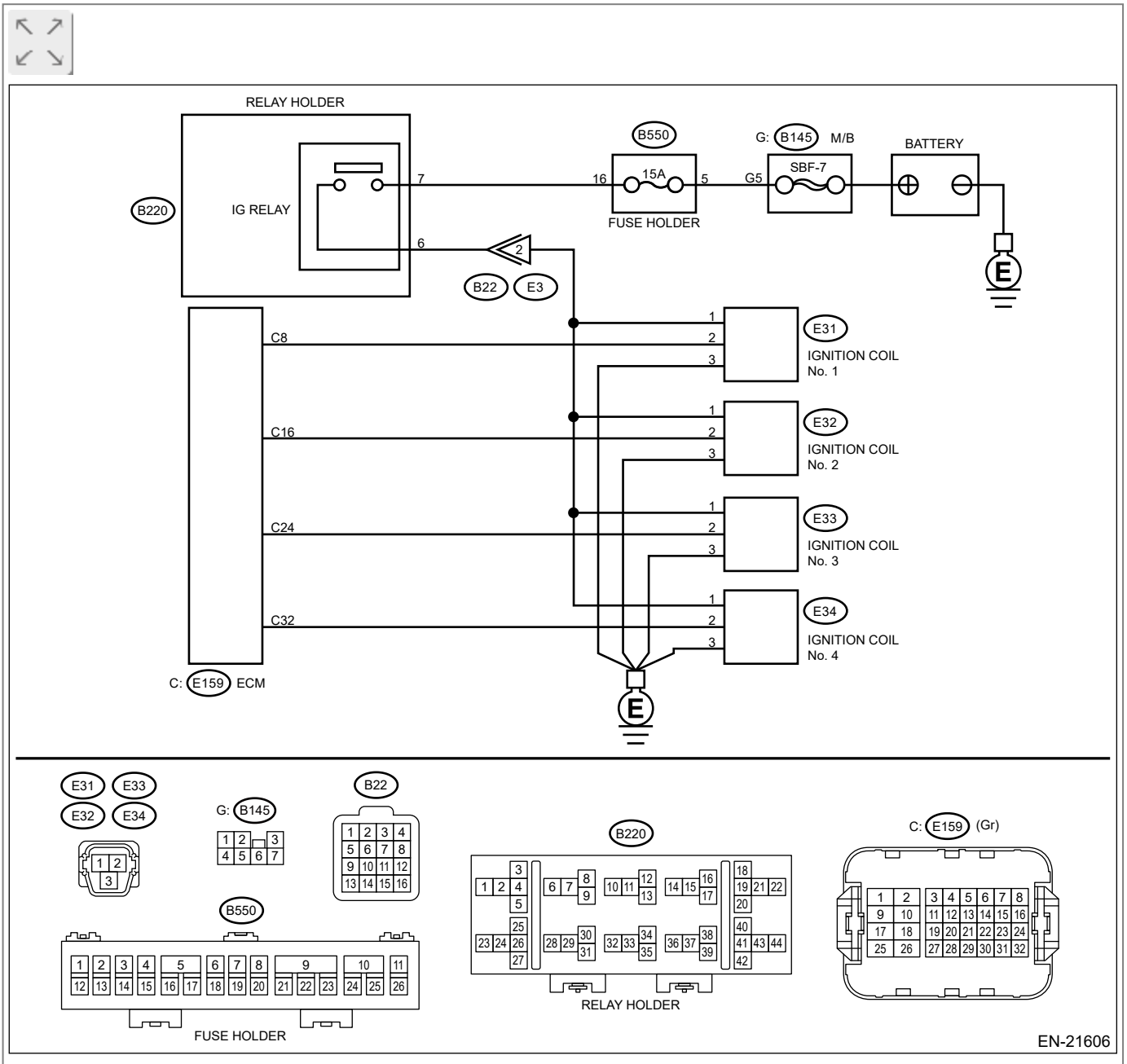
IGNITION CONTROL SYSTEM

Caution:

- After servicing or replacing faulty parts, perform **Clear Memory** Ref. to **ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode.** and **Inspection Mode** Ref. to **ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- Use the check board when measuring the ECM terminal voltage and resistance.



Wiring diagram:

Engine Electrical System Ref. to **WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.**



1. CHECK SPARK PLUG CONDITION.



1. Remove the spark plug.  [Ref. to IGNITION\(H4DOTC\)>Spark Plug>REMOVAL.](#)
2. Check the spark plug condition.  [Ref. to IGNITION\(H4DOTC\)>Spark Plug>INSPECTION.](#)

Is the spark plug condition normal?


Yes

 [Go to 2.](#)

No


Replace the spark plug.  [Ref. to IGNITION\(H4DOTC\)>Spark Plug.](#)

2. CHECK IGNITION SYSTEM FOR SPARKS.

1. Connect the spark plug to ignition coil.
2. Release the fuel pressure.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Fuel>PROCEDURE > RELEASING OF FUEL PRESSURE.](#)
3. Contact the spark plug thread portion to engine.
4. While opening the throttle valve fully, crank the engine to check that spark occurs at each cylinder.

Does spark occur at each cylinder?

Yes

Check fuel pump system.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Diagnostics for Engine Starting Failure>FUEL PUMP CIRCUIT.](#)

No

 [Go to 3.](#)

3. CHECK IGNITION COIL POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ignition coil.
3. Turn the ignition switch to ON.
4. Measure the voltage between ignition coil connector and engine ground.

Connector & terminal

(E31) No. 1 (+) — Engine ground (—):

(E32) No. 1 (+) — Engine ground (—):

(E33) No. 1 (+) — Engine ground (—):

(E34) No. 1 (+) — Engine ground (—):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open or short to ground in power supply circuit**
- **Poor contact of coupling connector**
- **Blown out of fuse**

4. CHECK HARNESS OF IGNITION COIL GROUND CIRCUIT.

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between ignition coil connector and engine ground.

Connector & terminal

(E31) No. 2 — Engine ground:


(E32) No. 2 — Engine ground:

(E33) No. 2 — Engine ground:

(E34) No. 2 — Engine ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 5.](#)

No

Repair the open circuit in harness between ignition coil connector and engine grounding terminal.

5. CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM and ignition coil connector.

Connector & terminal

(E159) No. 8 — (E31) No. 3:


(E159) No. 16 — (E32) No. 3:

(E159) No. 24 — (E33) No. 3:

(E159) No. 32 — (E34) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 6.](#)

No

Repair the open circuit in harness between ECM and ignition coil connector.

6. CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR.



Measure the resistance of harness between ECM and engine ground.

Connector & terminal

- (E159) No. 8 — Engine ground:
- (E159) No. 16 — Engine ground:
- (E159) No. 24 — Engine ground:
- (E159) No. 32 — Engine ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 7.](#)

No

Repair the ground short circuit of harness between ECM and ignition coil connector.

7. CHECK FOR POOR CONTACT.




Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes






Repair the poor contact of ECM connector.

No

Replace the ignition coil.  [Ref. to IGNITION\(H4DOTC\)>Ignition Coil.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostics for Engine Starting Failure



PROCEDURE

1. Check of the fuel amount
↓
2. Inspection of starter motor circuit  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics for Engine Starting Failure>STARTER MOTOR CIRCUIT.
↓
3. Inspection of ECM power supply and ground line  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics for Engine Starting Failure>CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM).
↓
4. Inspection of ignition control system  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics for Engine Starting Failure>IGNITION CONTROL SYSTEM.
↓
5. Inspection of fuel pump circuit  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics for Engine Starting Failure>FUEL PUMP CIRCUIT.
↓
6. Inspection of fuel injector circuit  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics for Engine Starting Failure>FUEL INJECTOR CIRCUIT.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostics for Engine Starting Failure
STARTER MOTOR CIRCUIT

1. MODEL WITHOUT PUSH BUTTON START

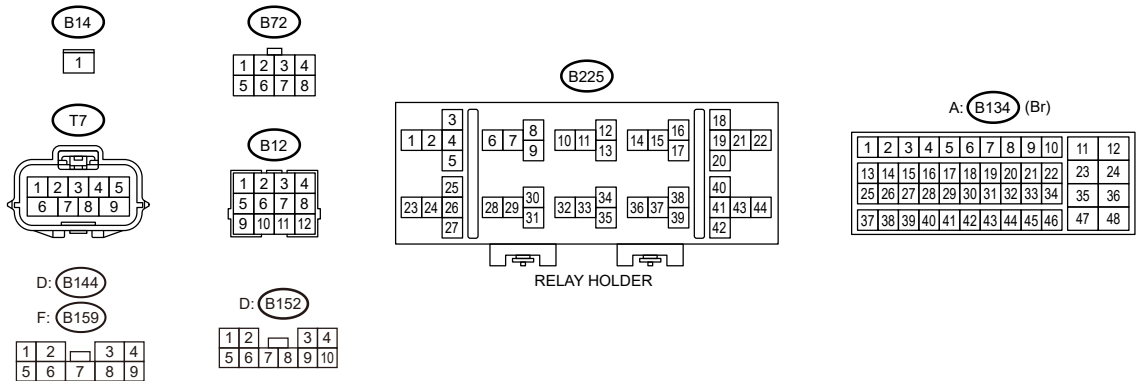
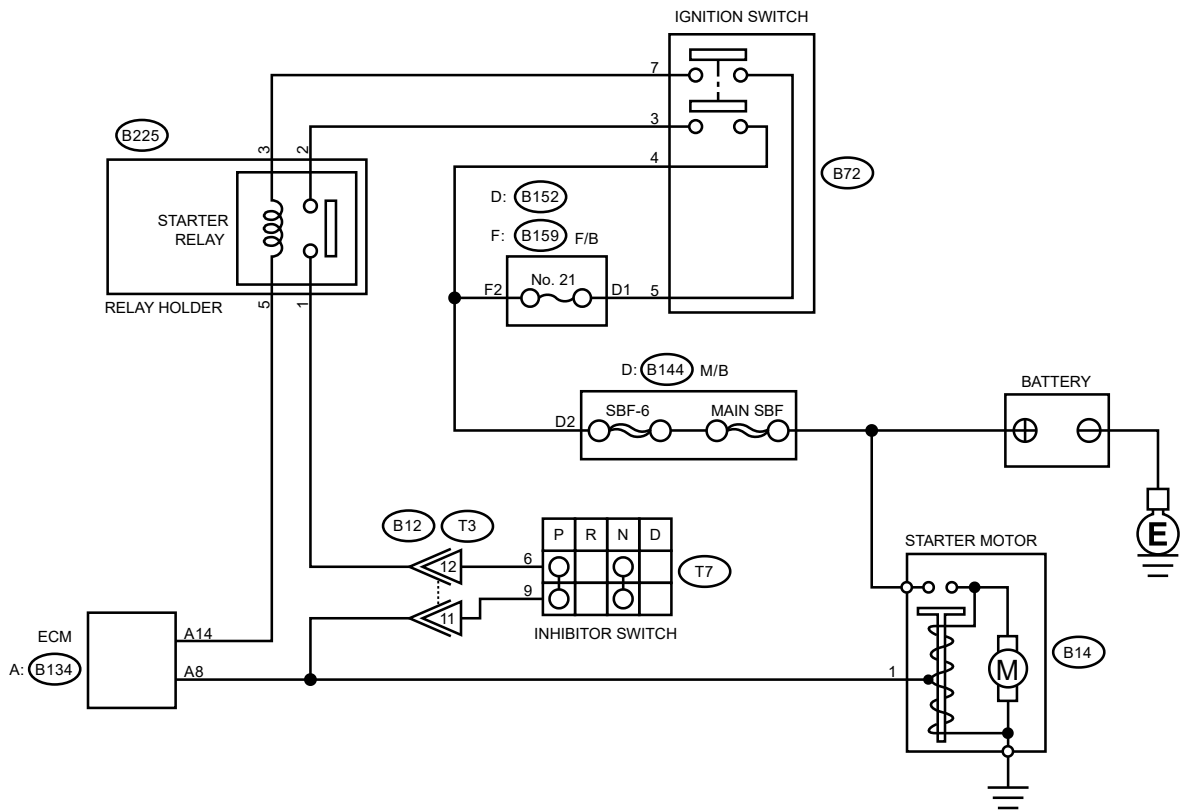
Caution:

- **After servicing or replacing faulty parts, perform Clear Memory  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Clear Memory Mode. and Inspection Mode  Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **Use the check board when measuring the ECM terminal voltage and resistance.**

Wiring diagram:

Engine Electrical System  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.](#)





EN-21613

1. CHECK BATTERY.


Check the battery. [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)

Is the battery OK?

Yes

[Go to 2.](#)

No

Charge or replace the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)

2. CHECK OPERATION OF STARTER MOTOR.

Does the starter motor operate?


Yes

 [Go to 3.](#)


No

 [Go to 4.](#)


3. CHECK DTC.

Are any DTCs displayed?  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Check ignition control system.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostics for Engine Starting Failure>IGNITION CONTROL SYSTEM.](#)

4. CHECK INPUT SIGNAL FOR STARTER MOTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from starter motor.
3. Turn the ignition switch to START.
4. Measure the voltage between the starter motor connector and the engine ground.

Connector & terminal

(B14) No. 1 (+) — Engine ground (-):

Note:

Place the select lever in "P" range or "N" range.

Is the voltage 10 V or more?

Yes

Check the starter motor.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Starter.](#)

No

 [Go to 5.](#)

5. CHECK HARNESS BETWEEN BATTERY AND IGNITION SWITCH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ignition switch.
3. Measure the power supply voltage between ignition switch connector and chassis ground.

Connector & terminal

(B72) No. 4 (+) — Chassis ground (–):

(B72) No. 5 (+) — Chassis ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 6.](#)

No

Repair the power supply circuit.

6. CHECK IGNITION SWITCH.

Measure the resistance between ignition switch terminals after turning the ignition switch to START position.

Terminals

No. 3 — No. 4:


No. 5 — No. 7:

Is the resistance less than 1 Ω ?

Yes

 [Go to 7.](#)

No

Replace the ignition switch.  [Ref. to SECURITY AND LOCKS>Ignition Key Lock>REPLACEMENT.](#)

7. CHECK INPUT VOLTAGE OF STARTER RELAY.

1. Turn the ignition switch to OFF.
2. Remove the starter relay.
3. Connect the connector to ignition switch.
4. Measure the voltage between starter relay connector and chassis ground after turning the ignition switch to START position.

Connector & terminal

(B225) No. 2 (+) — Chassis ground (–):

(B225) No. 3 (+) — Chassis ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 8.](#)

No

Check the following item and repair if necessary.

- Blown out of fuse
- Open or short circuit to ground in harness between starter relay and ignition switch connector

8. CHECK HARNESS BETWEEN ECM AND STARTER RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM and starter relay connector.

Connector & terminal

(B134) No. 14 — (B225) No. 5:

Is the resistance less than 1 Ω ?

Yes

 [Go to 9.](#)

No

Repair the open circuit of harness between ECM and starter relay connector.

9. CHECK STARTER RELAY.


1. Connect the battery to starter relay terminals No. 3 and No. 5.
2. Measure the resistance between starter relay terminals.

Terminals


No. 1 — No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 10.](#)

No

Replace the starter relay.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Electrical Component Location.](#)

10. CHECK HARNESS BETWEEN STARTER RELAY AND INHIBITOR SWITCH CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from inhibitor switch.
3. Measure the resistance of harness between starter relay connector and inhibitor switch connector.

Connector & terminal

(B225) No. 1 — (T7) No. 6:

Is the resistance less than 1 Ω ?

Yes

 [Go to 11.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- Open circuit in harness between starter relay connector and inhibitor switch connector
- Poor contact of coupling connector

11. CHECK HARNESS BETWEEN INHIBITOR SWITCH AND STARTER MOTOR.




Measure the resistance of harness between the inhibitor switch connector and starter motor.

Connector & terminal

(T7) No. 9 — (B14) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 12.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- Open circuit in harness between inhibitor switch connector and starter motor
- Poor contact of coupling connector

12. CHECK INHIBITOR SWITCH.




1. Place the select lever in "P" range and "N" range.
2. Measure the resistance between inhibitor switch terminals.

Terminals


No. 6 — No. 9:

Is the resistance less than 1 Ω ?

Yes


Check the engine control module (ECM) power supply and ground line.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostics for Engine Starting Failure>CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE \(ECM\).](#)

No


Replace the inhibitor switch.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Inhibitor Switch.](#)

2. MODEL WITH PUSH BUTTON START

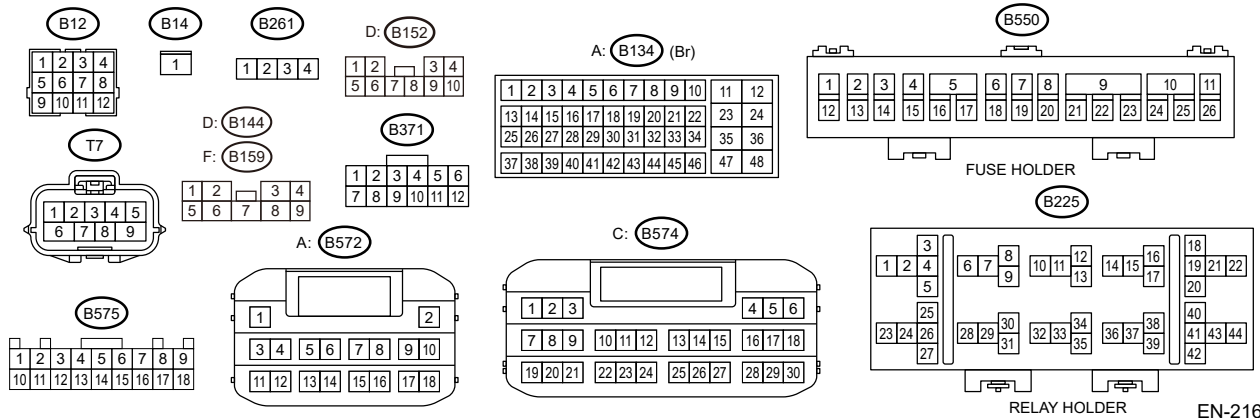
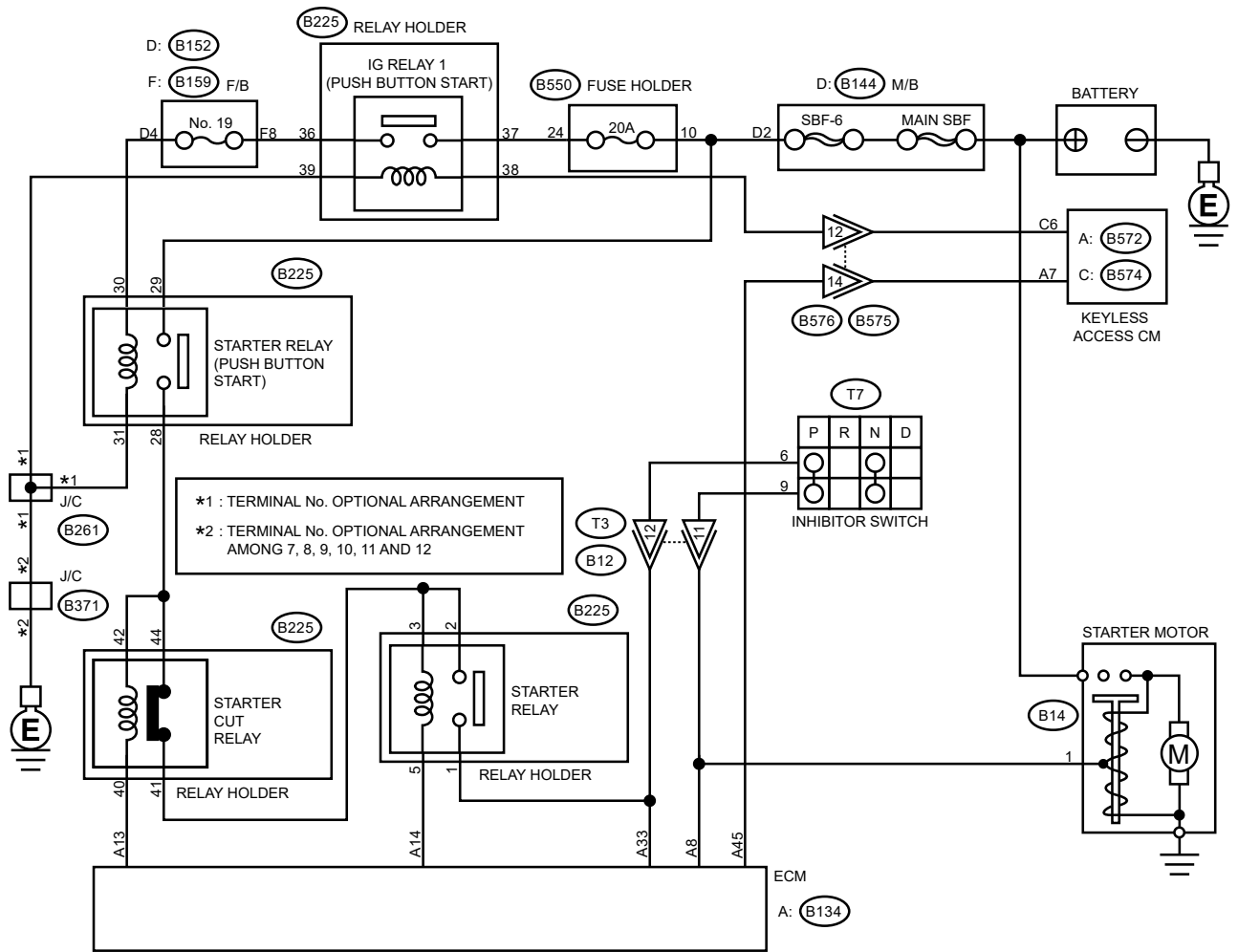
Caution:

After servicing or replacing faulty parts, perform Clear Memory  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode>OPERATION. and Inspection Mode !\[\]\(a86c7d1c9cb81c81614634a31267440d_img.jpg\) \[Ref. to ENGINE \\(DIAGNOSTICS\\)\\(H4DOTC\\)>Inspection Mode>PROCEDURE..\]\(#\)](#)

Wiring diagram:

Engine Electrical System TURBO MODEL (WITH PUSH BUTTON START)  [Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM > TURBO MODEL \(WITH PUSH BUTTON START\).](#)





RELAY HOLDER EN-21614

1. CHECK BATTERY.


Check the battery. [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)

Is the battery OK?

Yes

[Go to 2.](#)


No

Charge or replace the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)


2. CHECK OPERATION OF STARTER MOTOR.

Does the starter motor operate?


Yes

 [Go to 3.](#)


No

 [Go to 4.](#)


3. CHECK DTC.

Are any DTCs displayed?  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Check ignition control system.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostics for Engine Starting Failure>IGNITION CONTROL SYSTEM.](#)

4. CHECK PUSH BUTTON IGNITION SWITCH.

Press the push button ignition switch twice with the ignition OFF (ACC OFF).

Note:


Release the brake pedal.

Does the ignition turn to ON?

Yes

 [Go to 5.](#)

No

Check the push button start system.  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>General Diagnostic Table>INSPECTION > POWER SUPPLY SWITCHING SYSTEM.](#)

5. CHECK PUSH BUTTON IGNITION SWITCH.

1. Depress the brake pedal.

Note:

Shift the select lever to "P" range.


2. Check the push button ignition switch indicator.

Does the indicator turn to green?

Yes

 [Go to 6.](#)

No

Check the push button start system.  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > ENGINE DOES NOT START.](#)

6. CHECK START SWITCH SIGNAL.

1. Using the Subaru Select Monitor, read the waveform in [Starter Switch].


Note:

For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

2. Press the push button ignition switch once with the brake pedal depressed.

Does a waveform occur in [Starter Switch]?

Yes

 [Go to 10.](#)

No

 [Go to 7.](#)

7. CHECK HARNESS BETWEEN ECM AND KEYLESS ACCESS CM.

1. Turn the ignition to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the keyless access CM.
4. Measure the resistance of harness between ECM and keyless access CM.

Connector & terminal

(B134) No. 45 — (B572) No. 7:

Is the resistance less than 1 Ω ?

Yes

 [Go to 8.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- Open circuit in harness between ECM and keyless access CM
- Poor contact of coupling connector

8. CHECK HARNESS BETWEEN ECM AND KEYLESS ACCESS CM.

Measure the resistance between ECM and chassis ground.

Connector & terminal

(B134) No. 45 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 9.](#)

No

Repair the short circuit to ground in harness between ECM and keyless access CM.

9. CHECK START SWITCH SIGNAL.

1. Connect the connector to ECM.
2. Connect the connector to the keyless access CM.
3. Read the waveform of start switch signal using an oscilloscope.
4. Press the push button ignition switch once with the brake pedal depressed.

Connector & terminal

(B134) No. 45 (+) — Chassis ground (-):

Does waveform of the start switch signal occur?

Yes

Repair the poor contact of ECM connector.

No

Repair the poor contact of keyless access CM connector.

10. CHECK INPUT SIGNAL FOR STARTER MOTOR.


1. Turn the ignition to OFF.
2. Disconnect the connector from starter motor.
3. Place the select lever in "P" range or "N" range.
4. Press the push button ignition switch once with the brake pedal depressed.
5. Measure the voltage between the starter motor connector and the engine ground.

Connector & terminal


(B14) No. 1 (+) — Engine ground (-):

Is the voltage 10 V or more?

Yes

Check the starter motor.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Starter.](#)

No

 [Go to 11.](#)

11. CHECK IG RELAY 1 (PUSH BUTTON START) POWER SUPPLY.

1. Remove the IG relay 1 (push button start).
2. Turn the ignition to ON.
3. Measure the voltage between the IG relay 1 (push button start) connector and chassis ground.


Connector & terminal

(B225) No. 37 (+) — Chassis ground (-):

(B225) No. 38 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 12.](#)

No

Check the following item and repair or replace if necessary.

- Blown out of fuse
- Open circuit or short circuit to ground in harness between IG relay 1 (push button start) connector and keyless access CM
- Open circuit or short circuit to ground in harness between IG relay 1 (push button start) connector and battery

12. CHECK HARNESS BETWEEN IG RELAY 1 (PUSH BUTTON START) CONNECTOR AND CHASSIS GROUND.


1. Turn the ignition to OFF.
2. Measure the resistance of harness between the IG relay 1 (push button start) connector and chassis ground.

Connector & terminal

(B225) No. 39 — Chassis ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 13.](#)

No

Check the following item and repair or replace if necessary.

- Open circuit in harness between IG relay 1 (push button start) connector and chassis ground
- Poor contact of coupling connector

13. CHECK IG RELAY 1 (PUSH BUTTON START).



1. Connect the battery to IG relay 1 (push button start) terminals No. 38 and No. 39.
2. Measure the resistance between IG relay 1 (push button start) terminals.

Terminals

No. 36 — No. 37:

Is the resistance less than 1 Ω ?

Yes

[Go to 14.](#)

No

Replace the IG relay 1 (push button start). [Ref. to SECURITY AND LOCKS>IG Relay1 \(Push Button Start\).](#)

14. CHECK STARTER RELAY (PUSH BUTTON START) POWER SUPPLY.



1. Install the IG relay 1 (push button start).
2. Remove the starter relay (push button start).
3. Turn the ignition to ON.
4. Measure the voltage between starter relay (push button start) connector and chassis ground.

Connector & terminal

(B225) No. 29 (+) — Chassis ground (-):

(B225) No. 30 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

[Go to 15.](#)

No

Check the following item and repair or replace if necessary.

- Blown out of fuse (F/B No. 26)
- Open circuit or short circuit to ground in harness between starter relay (push button start) connector and IG relay 1 (push button start) connector
- Open circuit or short circuit to ground in harness between starter relay (push button start) connector and battery

15. CHECK HARNESS BETWEEN STARTER RELAY (PUSH BUTTON START) CONNECTOR AND CHASSIS GROUND.



1. Turn the ignition to OFF.


- 2.** Measure the resistance of harness between starter relay (push button start) connector and chassis ground.

Connector & terminal

(B225) No. 31 — Chassis ground:

Is the resistance less than 5 Ω ?

Yes

 [Go to 16.](#)

No

Check the following item and repair or replace if necessary.

- Open circuit in harness between starter relay (push button start) connector and chassis ground
- Poor contact of coupling connector

16. CHECK STARTER RELAY (PUSH BUTTON START).


- 1.** Connect the battery to starter relay (push button start) terminals No. 30 and No. 31.
- 2.** Measure the resistance between starter relay (push button start) terminals.

Terminals


No. 28 — No. 29:

Is the resistance less than 1 Ω ?

Yes

 [Go to 17.](#)

No

Replace the starter relay (push button start).  [Ref. to SECURITY AND LOCKS>Starter Relay \(Push Button Start\).](#)

17. CHECK HARNESS BETWEEN STARTER RELAY (PUSH BUTTON START) CONNECTOR AND STARTER CUT RELAY CONNECTOR.

- 1.** Remove the starter cut relay.
- 2.** Measure the resistance of harness between starter relay (push button start) connector and starter cut relay connector.


Connector & terminal

(B225) No. 28 — (B225) No. 42:

(B225) No. 28 — (B225) No. 44:

Is the resistance less than 1 Ω ?

Yes

 [Go to 18.](#)

No

Repair the open circuit in harness between starter relay (push button start) connector and starter cut relay connector.

18. CHECK HARNESS BETWEEN ECM AND STARTER CUT RELAY CONNECTOR.


1. Disconnect the connector from ECM.
2. Measure the resistance between starter cut relay and chassis ground.

Connector & terminal

(B225) No. 40 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 19.](#)

No

Repair the short circuit to ground in harness between ECM and starter cut relay connector.

19. CHECK STARTER CUT RELAY.


Measure the resistance between starter cut relay terminals.

Terminals


No. 41 — No. 44:

Is the resistance less than 1 Ω ?

Yes

 [Go to 20.](#)

No

Replace the starter cut relay.  [Ref. to SECURITY AND LOCKS>Starter Cut Relay.](#)

20. CHECK HARNESS BETWEEN STARTER CUT RELAY CONNECTOR AND STARTER RELAY CONNECTOR.

Measure the resistance of harness between starter cut relay connector and starter relay connector.


Connector & terminal

(B225) No. 41 — (B225) No. 2:

(B225) No. 41 — (B225) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 21.](#)

No

Repair the open circuit in harness between starter cut relay connector and starter relay connector.

21. CHECK HARNESS BETWEEN ECM AND STARTER RELAY CONNECTOR.



Measure the resistance of harness between ECM and starter relay connector.

Connector & terminal

(B134) No. 14 — (B225) No. 5:

Is the resistance less than 1 Ω ?

Yes

[Go to 22.](#)

No

Repair the open circuit of harness between ECM and starter relay connector.

22. CHECK STARTER RELAY.



1. Connect the battery to starter relay terminals No. 3 and No. 5.
2. Measure the resistance between starter relay terminals.

Terminals

No. 1 — No. 2:

Is the resistance less than 1 Ω ?

Yes

[Go to 23.](#)

No

Replace the starter relay. [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Electrical Component Location>LOCATION.](#)

23. CHECK HARNESS BETWEEN STARTER RELAY CONNECTOR AND INHIBITOR SWITCH CONNECTOR.



1. Disconnect the connector from inhibitor switch.
2. Measure the resistance of harness between starter relay connector and inhibitor switch connector.

Connector & terminal

(B225) No. 1 — (T7) No. 6:

Is the resistance less than 1 Ω ?

Yes

[Go to 24.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between starter relay connector and inhibitor switch connector**
- **Poor contact of coupling connector**

24. CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM and inhibitor switch connector.


Connector & terminal

(B134) No. 33 — (T7) No. 6:

(B134) No. 8 — (T7) No. 9:

Is the resistance less than 1 Ω ?

Yes

 [Go to 25.](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM and inhibitor switch connector**
- **Poor contact of coupling connector**

25. CHECK INHIBITOR SWITCH.


1. Place the select lever in "P" range or "N" range.
2. Measure the resistance between inhibitor switch terminals.

Terminals


No. 6 — No. 9:

Is the resistance less than 1 Ω ?

Yes

 [Go to 26.](#)

No

Replace the inhibitor switch.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Inhibitor Switch.](#)

26. CHECK NEUTRAL POSITION SWITCH SIGNAL.

1. Connect all relays to their proper positions.
2. Connect all connectors to their proper positions.
3. Using the Subaru Select Monitor, read the value in [Neutral Position Switch].


Note:

For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor.](#)

4. Turn the ignition to ON.
5. Place the select lever in "P" range or "N" range.

Is [ON] displayed?

Yes

Check the engine control module (ECM) power supply and ground line.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostics for Engine Starting Failure>CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE \(ECM\).](#)

No

repair the harness and connector.

Note:

In this case, repair the following item:


- **Open circuit in harness between inhibitor switch connector and starter motor connector**
- **Poor contact of coupling connector**

ENGINE (DIAGNOSTICS)(H4DOTC) > Drive Cycle

PROCEDURE

It is necessary to perform the drive cycle listed below if DTC is not found in the Inspection Mode. It is possible to complete diagnosis of the DTC by performing the indicated drive cycle. After the repair for the DTC, perform a necessary drive cycle and make sure the function recovers and the DTC is recorded.

1. PREPARATION FOR DRIVE CYCLE

1. Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 L (5.3—10.6 US gal, 4.4—8.8 Imp gal)].
2. After performing the diagnostics and clearing memory, check that no DTC remains.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)

Note:


Perform the drive cycle after warming up the engine except when the engine coolant temperature at engine start is specified.

2. DRIVE CYCLE A

DTC	Item	Condition
P0087	FUEL RAIL/SYSTEM PRESSURE - TOO LOW BANK 1	Diagnosis completes in drive cycle B or C as well.
P0088	FUEL RAIL/SYSTEM PRESSURE - TOO HIGH BANK 1	Diagnosis completes in drive cycle B or C as well.
P0128	COOLANT THERMOSTAT (ENGINE COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE)	—
P0141	O2 SENSOR HEATER CIRCUIT BANK 1 SENSOR 2	—
P014C	A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1	—
P014D	A/F / O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 1	—
P015A	A/F / O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 1	—
P015B	A/F / O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 1	—
P0171	SYSTEM TOO LEAN BANK 1	Diagnosis completes in drive cycle B or C as well.
P0172	SYSTEM TOO RICH BANK 1	Diagnosis completes in drive cycle B or C as well.
P0300	RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED	Diagnosis completes in drive cycle B or C as well.
P0301	CYLINDER 1 MISFIRE DETECTED	Diagnosis completes in drive cycle B or C as well.
P0302	CYLINDER 2 MISFIRE DETECTED	Diagnosis completes in drive cycle B or C as well.
P0303	CYLINDER 3 MISFIRE DETECTED	Diagnosis completes in drive cycle B or C as well.
P0304	CYLINDER 4 MISFIRE DETECTED	Diagnosis completes in

		drive cycle B or C as well.
P0420	CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD BANK 1	—
P0459	EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT HIGH	—
P1191	FUEL RAIL PRESSURE SENSOR "A" CIRCUIT NO ACTIVITY DETECTED	Diagnosis completes in drive cycle B or C as well.
P2096	POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1	Diagnosis completes in drive cycle B or C as well.
P2097	POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1	Diagnosis completes in drive cycle B or C as well.
P2195	A/F /O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 1	—
P2196	A/F /O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 1	—

Diagnostic procedure:

1. Drive for 20 minutes or more at a constant speed of 80 km/h (50 MPH) or more.
2. Stop the vehicle and idle for one minute.
3. Read the temporary code using the Subaru Select Monitor or general scan tool.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)

3. DRIVE CYCLE B

DTC	Item	Condition
P0087	FUEL RAIL/SYSTEM PRESSURE - TOO LOW BANK 1	Diagnosis completes in drive cycle A or C as well.
P0088	FUEL RAIL/SYSTEM PRESSURE - TOO HIGH BANK 1	Diagnosis completes in drive cycle A or C as well.
P0125	[Insufficient Coolant Temperature for Closed Loop Fuel Control]	Engine coolant temperature at starting: Less than -15°C (5°F)
P0130	A/F / O2 SENSOR CIRCUIT BANK 1 SENSOR 1	—
P0137	O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 2	—
P0138	O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 2	—
P0171	SYSTEM TOO LEAN BANK 1	Diagnosis completes in drive cycle A or C as well.
P0172	SYSTEM TOO RICH BANK 1	Diagnosis completes in drive cycle A or C as well.
P0300	RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED	Diagnosis completes in drive cycle A or C as well.
P0301	CYLINDER 1 MISFIRE DETECTED	Diagnosis completes in drive cycle A or C as well.
P0302	CYLINDER 2 MISFIRE DETECTED	Diagnosis completes in drive cycle A or C as well.
P0303	CYLINDER 3 MISFIRE DETECTED	Diagnosis completes in drive cycle A or C as well.
P0304	CYLINDER 4 MISFIRE DETECTED	Diagnosis completes in

		drive cycle A or C as well.
P0500	VEHICLE SPEED SENSOR "A" CIRCUIT	—
P0506	IDLE CONTROL SYSTEM RPM - LOWER THAN EXPECTED	—
P0507	IDLE CONTROL SYSTEM RPM - HIGHER THAN EXPECTED	—
P062D	FUEL INJECTOR DRIVER CIRCUIT PERFORMANCE BANK 1	—
P0700	TRANSMISSION CONTROL SYSTEM (MIL REQUEST)	—
P1191	FUEL RAIL PRESSURE SENSOR "A" CIRCUIT NO ACTIVITY DETECTED	Diagnosis completes in drive cycle A or C as well.
P1261	CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN	—
P1262	CYLINDER 2 DIRECT FUEL INJECTOR CIRCUIT/OPEN	—
P1263	CYLINDER 3 DIRECT FUEL INJECTOR CIRCUIT/OPEN	—
P1264	CYLINDER 4 DIRECT FUEL INJECTOR CIRCUIT/OPEN	—
P2006	TGV CONTROL STUCK CLOSED BANK 1	—
P2007	TGV CONTROL STUCK CLOSED BANK 2	—
P2096	POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1	Diagnosis completes in drive cycle A or C as well.
P2097	POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1	Diagnosis completes in drive cycle A or C as well.

Diagnostic procedure:

1. Drive at 10 km/h (6 MPH) or more.
2. Stop the vehicle and idle for ten minutes.
3. Read the temporary code using the Subaru Select Monitor or general scan tool.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)

4. DRIVE CYCLE C

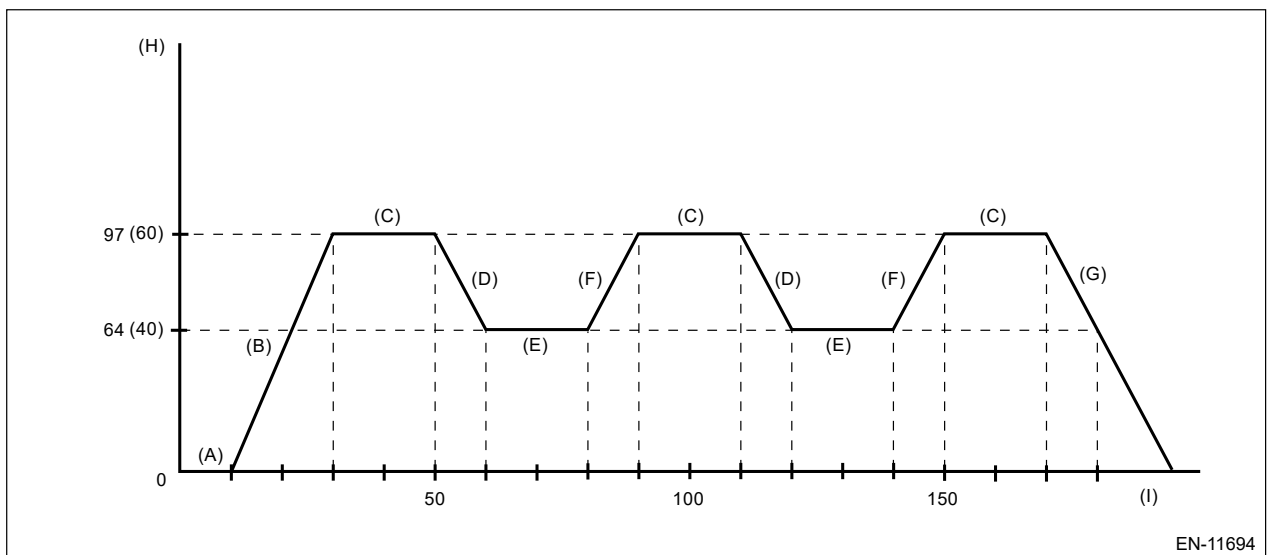
DTC	Item	Condition
P000A	"A" CAMSHAFT POSITION SLOW RESPONSE BANK 1	—
P000B	"B" CAMSHAFT POSITION SLOW RESPONSE BANK 1	—
P000C	"A" CAMSHAFT POSITION SLOW RESPONSE BANK 2	—
P000D	"B" CAMSHAFT POSITION SLOW RESPONSE BANK 2	—
P0011	"A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1	—
P0014	"B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1	—
P0021	"A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2	—
P0024	"B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2	—
P0030	A/F / O2 HEATER CONTROL CIRCUIT BANK 1 SENSOR 1	—
P0068	MAP/MAF - THROTTLE POSITION CORRELATION	—
P0087	FUEL RAIL/SYSTEM PRESSURE - TOO LOW BANK 1	Diagnosis completes in drive cycle A or B as well.
P0088	FUEL RAIL/SYSTEM PRESSURE - TOO HIGH BANK 1	Diagnosis completes in drive cycle A or B as well.

P0101	MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT RANGE/PERFORMANCE	—
P0134	A/F / O2 SENSOR CIRCUIT NO ACTIVITY DETECTED BANK 1 SENSOR 1	—
P013A	O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2	—
P013B	O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 2	—
P013E	O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 2	—
P013F	O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 2	—
P0171	SYSTEM TOO LEAN BANK 1	Diagnosis completes in drive cycle A or B as well.
P0172	SYSTEM TOO RICH BANK 1	Diagnosis completes in drive cycle A or B as well.
P0244	TURBO/SUPER CHARGER WASTEGATE SOLENOID "A" RANGE/PERFORMANCE	—
P0246	TURBOCHARGER/SUPERCHARGER WASTEGATE SOLENOID "A" HIGH	—
P0300	RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED	Diagnosis completes in drive cycle A or B as well.
P0301	CYLINDER 1 MISFIRE DETECTED	Diagnosis completes in drive cycle A or B as well.
P0302	CYLINDER 2 MISFIRE DETECTED	Diagnosis completes in drive cycle A or B as well.
P0303	CYLINDER 3 MISFIRE DETECTED	Diagnosis completes in drive cycle A or B as well.
P0304	CYLINDER 4 MISFIRE DETECTED	Diagnosis completes in drive cycle A or B as well.
P0400	EGR "A" FLOW	—
P04AD	EVAP SYSTEM (CPC) PURGE CONTROL VALVE "B" CIRCUIT HIGH	—
P0851	PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW	—
P0852	PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH	—
P1191	FUEL RAIL PRESSURE SENSOR "A" CIRCUIT NO ACTIVITY DETECTED	Diagnosis completes in drive cycle A or B as well.
P1449	EVAP SYSTEM CLOG DETECTED (AIR FILTER)	—
P1492	COIL 1 EGR "A" CONTROL CIRCUIT LOW	—
P1493	COIL 1 EGR "A" CONTROL CIRCUIT HIGH	—
P1494	COIL 2 EGR "A" CONTROL CIRCUIT LOW	—
P1495	COIL 2 EGR "A" CONTROL CIRCUIT HIGH	—
P1496	COIL 3 EGR "A" CONTROL CIRCUIT LOW	—
P1497	COIL 3 EGR "A" CONTROL CIRCUIT HIGH	—
P1498	COIL 4 EGR "A" CONTROL CIRCUIT LOW	—

P1499	COIL 4 EGR "A" CONTROL CIRCUIT HIGH	—
P2004	TGV CONTROL STUCK OPEN BANK 1	—
P2005	TGV CONTROL STUCK OPEN BANK 2	—
P2096	POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1	Diagnosis completes in drive cycle A or B as well.
P2097	POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1	Diagnosis completes in drive cycle A or B as well.
P2270	O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 2	—
P2271	O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 2	—

Diagnostic procedure:

1. Drive according to the drive pattern described below.



- (A) Shift the select lever to "P" range, and let the engine idle for 10 seconds or more.
- (B) Accelerate to 97 km/h (60 MPH) or more within 20 seconds.
- (C) Drive for 20 seconds or more at 97 km/h (60 MPH) or more.
- (D) Decelerate with fully closed throttle to 64 km/h (40 MPH) or less.
- (E) Drive for 20 seconds or more at 64 km/h (40 MPH) or less.
- (F) Accelerate to 97 km/h (60 MPH) or more within 10 seconds.
- (G) Stop vehicle with the throttle fully closed.
- (H) Vehicle speed km/h (MPH)
- (I) Sec.

2. Read the temporary code using the Subaru Select Monitor or general scan tool. [🔧 Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)

5. DRIVE CYCLE E


DTC	Item	Condition
P0461	FUEL LEVEL SENSOR "A" CIRCUIT RANGE/PERFORMANCE	—

Diagnostic procedure:

- 1.** Make sure that the battery voltage is 10.9 V or more.
- 2.** Clear the memory. [🔧 Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)
- 3.** Drive for approximately 30 L (7.9 US gal, 6.6 Imp gal) of fuel.

Note:


- It is acceptable to drive the vehicle intermittently.
- Do not disconnect the battery terminals while diagnosing. (Data will be cleared by disconnecting the battery terminals.)

4. Read the temporary code using the Subaru Select Monitor or general scan tool.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)

6. DRIVE CYCLE F

DTC	Item	Condition
P0096	INTAKE AIR TEMPERATURE SENSOR 2 CIRCUIT RANGE/PERFORMANCE BANK 1	<ul style="list-style-type: none">• 6 hours have elapsed since ignition switch is OFF under a completely warmed up condition.• For models with block heater, at least 6 hours must have elapsed without operating the block heater.
P0111	INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE BANK 1	<ul style="list-style-type: none">• 6 hours have elapsed since ignition switch is OFF under a completely warmed up condition.• For models with block heater, at least 6 hours must have elapsed without operating the block heater.

Diagnostic procedure:

1. With the ignition switch ON (engine stopped), read the values in [Coolant Temp.] and [Intake Air Temp.].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

2. If the values from step 1) satisfy the following conditions, idle the engine for two minutes or more.

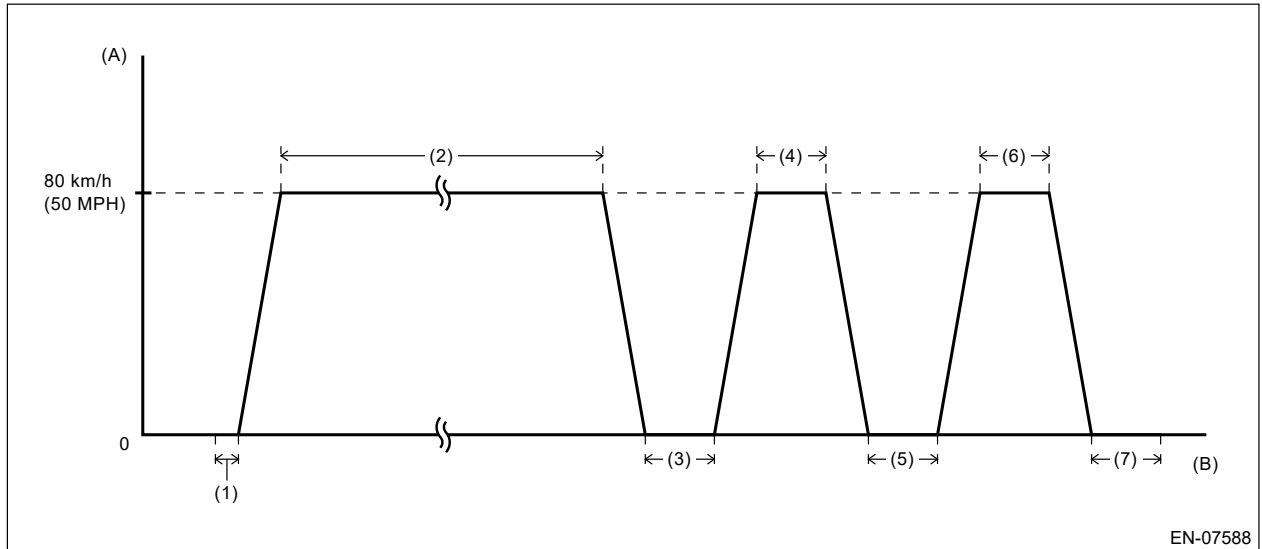
Condition:

|Engine coolant temperature — Intake air temperature| ≤ 5°C (9°F)

Note:

- If the conditions are not satisfied, turn the ignition switch to OFF and wait until the parameters are satisfied.
- Hold the select lever in "P" range or "N" range at idling.

3. Drive according to the drive pattern described below.



- (A) Vehicle speed (B) Elapsed time
- (1) Idle the engine for 2 minutes or more. (4) Drive for 30 seconds or more at a constant speed of 80 km/h (50 MPH) or more. (6) Drive for 30 seconds or more at a constant speed of 80 km/h (50 MPH) or more.
- (2) Drive for a total period of 15 minutes or more at a speed of 80 km/h (50 MPH) or more. (5) Stop the vehicle and idle for 30 seconds or more. (7) Stop the vehicle and idle for 30 seconds.
- (3) Stop the vehicle and idle for 30 seconds or more.

Note:

- In pattern (2), it is acceptable to decelerate to less than 80 km/h (50 MPH) or to stop the vehicle depending on the traffic conditions. Drive the vehicle at 80 km/h (50 MPH) or more until the total driving time reaches or exceeds 15 minutes.
- There is no given transition time between idling and cruising.
- Driving at constant speed only on a downhill causes smaller engine load and may result in failure to obtain a right diagnostic result.
- If the ignition switch is turned to OFF during driving cycle F, perform this driving cycle again after satisfying the conditions listed in the table.


4. Read the temporary code using the Subaru Select Monitor or general scan tool.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)

7. DRIVE CYCLE H

DTC	Item	Condition
P0071	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" RANGE/PERFORMANCE	<ul style="list-style-type: none"> • 6 hours have elapsed since ignition switch is OFF under a completely warmed up condition. • For models with block heater, at least 6 hours must have elapsed without

		operating the block heater.
P0116	ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE	<ul style="list-style-type: none"> • 6 hours have elapsed since ignition switch is OFF under a completely warmed up condition. • For models with block heater, at least 6 hours must have elapsed without operating the block heater.
P0196	ENGINE OIL TEMPERATURE SENSOR "A" RANGE/PERFORMANCE	<ul style="list-style-type: none"> • 6 hours have elapsed since ignition switch is OFF under a completely warmed up condition. • For models with block heater, at least 6 hours must have elapsed without operating the block heater.
P0451	EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT RANGE/PERFORMANCE	60 seconds have elapsed since ignition switch is OFF.
P050A	COLD START IDLE CONTROL SYSTEM PERFORMANCE	—
P050B	COLD START IGNITION TIMING PERFORMANCE	—
P2227	BAROMETRIC PRESSURE SENSOR "A" CIRCUIT RANGE/PERFORMANCE	60 seconds have elapsed since ignition switch is OFF.

Diagnostic procedure:

1. With the ignition switch ON (engine stopped), read the values in [Coolant Temp.] and [Intake Air Temp.].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)


2. If the values from step 1) satisfy the following conditions, idle the engine for two minutes or more.

Condition:

|Engine coolant temperature — Intake air temperature| ≤ 5°C (9°F)

Note:

- **If the conditions are not satisfied, turn the ignition switch to OFF and wait until the parameters are satisfied.**
- **Hold the select lever in "P" range or "N" range at idling.**

3. Read the temporary code using the Subaru Select Monitor or general scan tool.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)

8. DRIVE CYCLE I

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DTC	Item	Condition
P0455	EVAP SYSTEM (CPC) LEAK DETECTED (LARGE LEAK)	Engine coolant temperature: 5 – 45°C (41 – 113°F) Intake air temperature sensor #11: 5 – 50°C (41 – 122°F)
P0456	EVAP SYSTEM (CPC) LEAK DETECTED (VERY SMALL LEAK)	
P04AF	EVAP SYSTEM PURGE CONTROL VALVE (CPC) "B" STUCK CLOSED	
P1451	EVAP SYSTEM CLOG DETECTED (PIPE)	
P2402	EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT HIGH	
P2404	EVAP SYSTEM LEAK DETECTION PUMP SENSE CIRCUIT RANGE/PERFORMANCE	
P2420	EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT HIGH	


Caution:

Be careful of the state of the battery when performing the drive cycle I consecutively. Performing the drive cycle I consecutively without the engine running may cause a low battery voltage and battery discharge.

Note:

- If it is necessary to perform drive cycle I consecutively, drive the vehicle under the following conditions to release accumulated evaporating gas. Performing the drive cycle I consecutively without starting the engine causes a large amount of evaporating gas to accumulate in the canister, which hinders an accurate diagnosis.
 - After engine is warmed up.
 - Drive for 10 minutes or more at a speed of 48 km/h (30 MPH) or more (duration of drive can be an accumulation)
- To obtain an accurate diagnostic result, perform the procedures according to the following points.
 - Do not refuel gas immediately before performing drive cycle I. There will be a large amount of evaporating gas immediately after refuel, which may cause a less accurate diagnostic performance.
 - Do not shake the vehicle while performing drive cycle I. Shaking the vehicle causes evaporating gas to increase inside the fuel tank, which may cause a less accurate diagnostic performance.
 - Do not perform any service operation including installation or removal of parts or connectors while performing drive cycle I. Performing service operation could affect on the functions of related parts, which may cause a less accurate diagnostic performance.
- Perform **MODE \$08** when using a general scan tool.

Diagnostic procedure:

1. Prepare the Subaru Select Monitor.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>General Description>PREPARATION TOOL.](#)
2. Prepare PC with Subaru Select Monitor installed.
3. Connect the USB cable to the DST-i and the USB port on the personal computer (dedicated port for the Subaru Select Monitor).

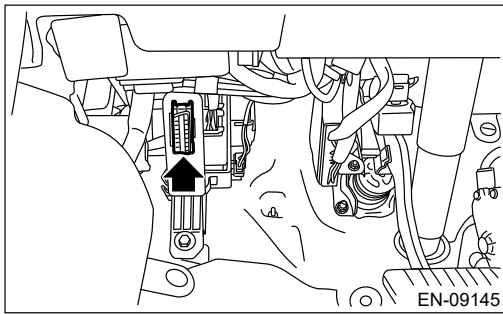
Note:

The dedicated port for the Subaru Select Monitor means the USB port which was used to install the Subaru Select Monitor.

4. Connect the diagnosis cable to DST-i.
5. Connect the DST-i to the data link connector located in the lower portion of the instrument panel (on the driver's side).

Caution:

Do not connect the scan tools except for Subaru Select Monitor and general scan tool.



6. Start the PC.
7. Turn the ignition switch to ON (engine OFF) and run the "PC application for Subaru Select Monitor".
8. On [Main Menu] display, select inspection for each system.
9. On [Select System] display, select [Engine Control System].
10. Click the [OK] button after the information of engine type has been displayed.
11. On the Engine Diagnosis display, select [Generic OBDII].
12. On the OBD menu display, select [Evaporative System Leak Test].
13. On [Evaporative System Leak Test] display, select [Evaporative System Leak Test].
14. On [Evaporative System Leak Test is running. Press Cancel to exit this function.] display, click [OK] button to perform evaporative system leak test.
15. When [Conditions have been enabled to control this function. Turn the ignition switch off to terminate the test.] display appears, wait for 30 minutes without clicking the [OK] button.

Caution:

Do not leave the vehicle for an extended period of time after the test is complete. This may cause early deterioration of the battery or discharged battery.

Note:

- Clicking [OK] button brings [Evaporative System Leak Test] display back, although the test is continuing.
- The Subaru Select Monitor screen does not change after the evaporative system leak test is complete or when the test is aborted by turning off the ignition switch.
- If "Test conditions are not correct" display appears, use Subaru Select Monitor to check that the values in [Coolant Temp.] and [Coolant Temp.] satisfy the conditions. If the conditions are satisfied, make the necessary preparation for the drive cycle again. [Ref. to Target Not Found](#)

16. After 30 minutes passed from the start of step 14), click [OK] button to return to the [Evaporative System Leak Test] display.
17. Return to the OBD menu display, and select [On-board monitor test result].
18. Check TID \$C1 —\$CA of MID \$3C in [On-board monitor test result].


Note:

Perform MODE \$06 and check when using a general scan tool.

Result of on-board monitor test

Display	Details	Remarks
\$0000 is stored in all Val.	During the evaporative system leak test, the test conditions were not met and the test was canceled.	Once the test conditions are met, perform the test again.
All Val. are stored with values and OK is set to all the results.	Evaporative system leak test is completed correctly.	While the ignition switch is ON, read the pending code using the

		Subaru Select Monitor.
Some results were no good.	The evaporative system leak test completed successfully but the results were faulty.	While the ignition switch is ON, read the pending code using the Subaru Select Monitor.

- 19.** When the evaporative system leak test is completed correctly, read the pending code with the ignition switch turned to ON position. If the DTC is recorded, check the appropriate DTC.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)


Note:

- **Perform MODE \$07 when using a general scan tool.**
- **The pending code will be cleared by turning ignition switch to OFF.**

9. DRIVE CYCLE J

DTC	Item	Condition
P2610	ECM/PCM ENGINE OFF TIMER PERFORMANCE	—

Diagnostic procedure:

1. Idle the engine for 15 minutes or more.
2. Turn the ignition switch to OFF.
3. After at least 10 hours passed from the start of step 2), read the temporary code using the Subaru Select Monitor or general scan tool.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)

10. DRIVE CYCLE N


DTC	Item	Condition
P0016	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR A	Coolant temperature 80°C (176°F) or more
P0017	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR B	
P0018	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR A	
P0019	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR B	

Warning:

When performing drive cycle N on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

1. Check the data in condition column of table by using the Subaru Select Monitor or general scan tool.

Note:

- **Subaru Select Monitor**
For detailed procedures, refer to "Data Monitor".  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.

2. While the conditions in the list are satisfied, race the engine at the speed of approx. 2500 rpm for 40 seconds or more.
3. Start to move the vehicle, then accelerate the vehicle to 50 km/h (31.1 MPH) or more.
4. When the speed reaches 50 km/h (31.1 MPH) or more, release the accelerator pedal and brake pedal to decelerate the vehicle without shifting the gear. At this time, select an appropriate gear beforehand so that the engine speed falls within the range from 2500 rpm to 1900 rpm for 5 seconds or more.

Note:

- **The vehicle speed does not matter so long as the engine speed can maintain from 2500 rpm to 1900 rpm for 5 seconds or more.**
Example: On a downhill grade, it can be performed with a low speed gear and at a low vehicle speed.
- **When it is performed with the electrical load such as the air conditioner, etc. turned OFF or the vehicle driven on a downhill grade, the engine speed decreases slowly. Therefore, the continuous time can be maintained easily.**


5. Bring the vehicle to a stop in a safe place, and idle it for 5 minutes or more.

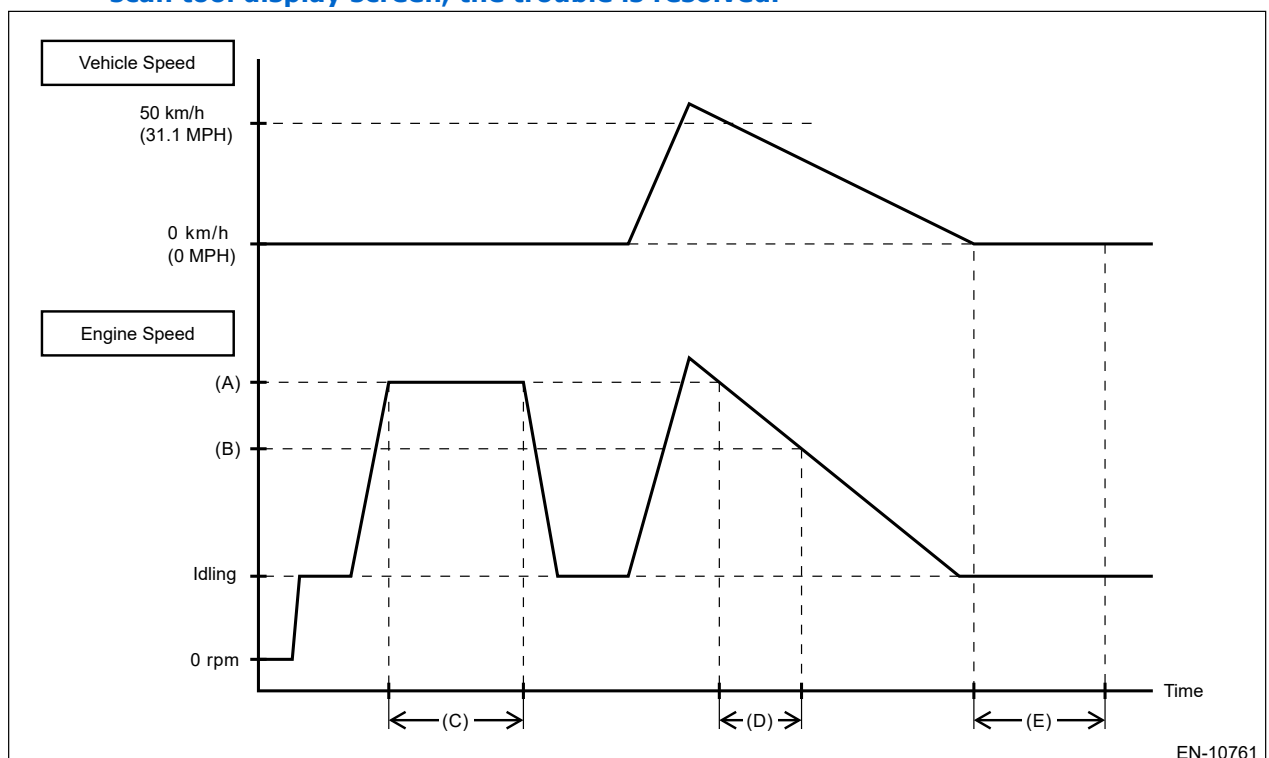
Note:

Driving method while vehicle is driven to a stop at safe place is not restricted.

6. With the vehicle idling, read the temporary diagnostic code of DTC using Subaru Select Monitor or general scan tool.

Note:

- **Refer to "Read Diagnostic Trouble Code (DTC)" for detailed operation procedure.** 
- **Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Read Diagnostic Trouble Code (DTC).**
- **In the step 6), if the DTC is not displayed on the Subaru Select Monitor or general scan tool display screen, the trouble is resolved.**



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- | | | |
|-----------------------|-----------------------|------------------------|
| (A) 2500 rpm | (B) 1900 rpm | (C) 40 seconds or more |
| (D) 5 seconds or more | (E) 5 minutes or more | |

11. DRIVE CYCLE O

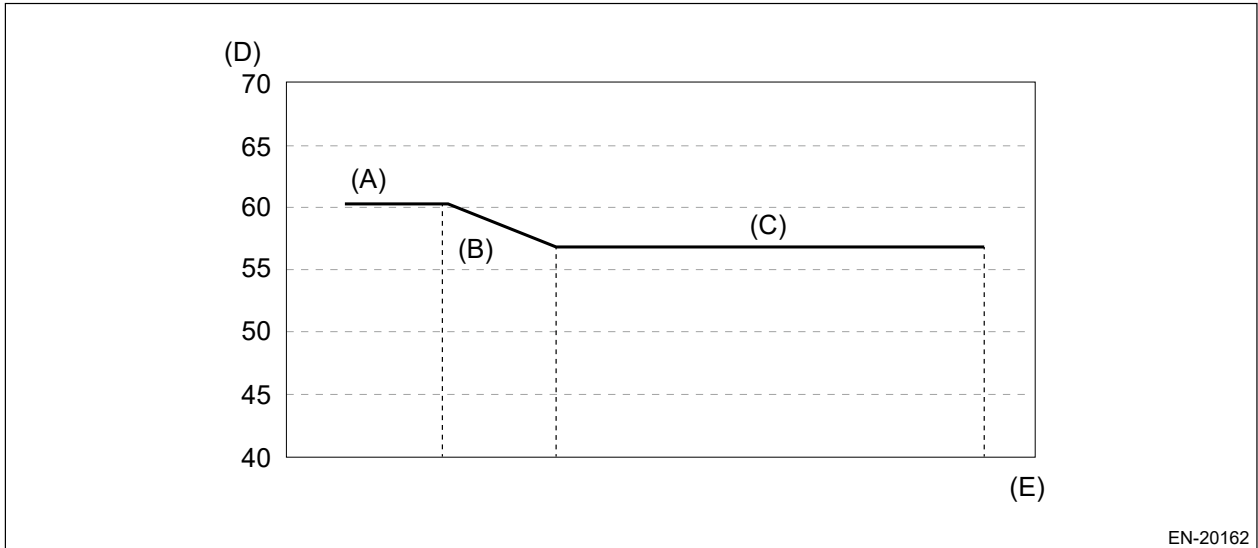
DTC	Item	Condition
P0441	EVAP SYSTEM (CPC) INCORRECT PURGE FLOW	—

Diagnostic procedure:

Warning:

When performing drive cycle O on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

1. Drive according to the drive pattern described below.



- (A) Drive the vehicle at 60 km/h (37 MPH) or faster for at least 5 minutes in fully warm-up condition.
- (B) Decelerate with the throttle fully closed for at least 3 seconds.
- (C) Drive the vehicle at a constant vehicle speed by depressing the accelerator pedal for at least 30 seconds.
- (D) Vehicle speed km/h (MPH)
- (E) Sec.

2. Park the vehicle on a safe place.

Note:

Driving method while vehicle is driven to a stop at safe place is not restricted.

3. With the vehicle idling, read the temporary diagnostic code of DTC using Subaru Select Monitor or general scan tool.

Note:

- For detailed operation procedures, refer to "Read Diagnostic Trouble Code (DTC)".
- Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Read Diagnostic Trouble Code (DTC).
- In the step 3), if the DTC is not displayed on the Subaru Select Monitor or general scan tool display screen, the trouble is resolved.

12. DRIVE CYCLE P

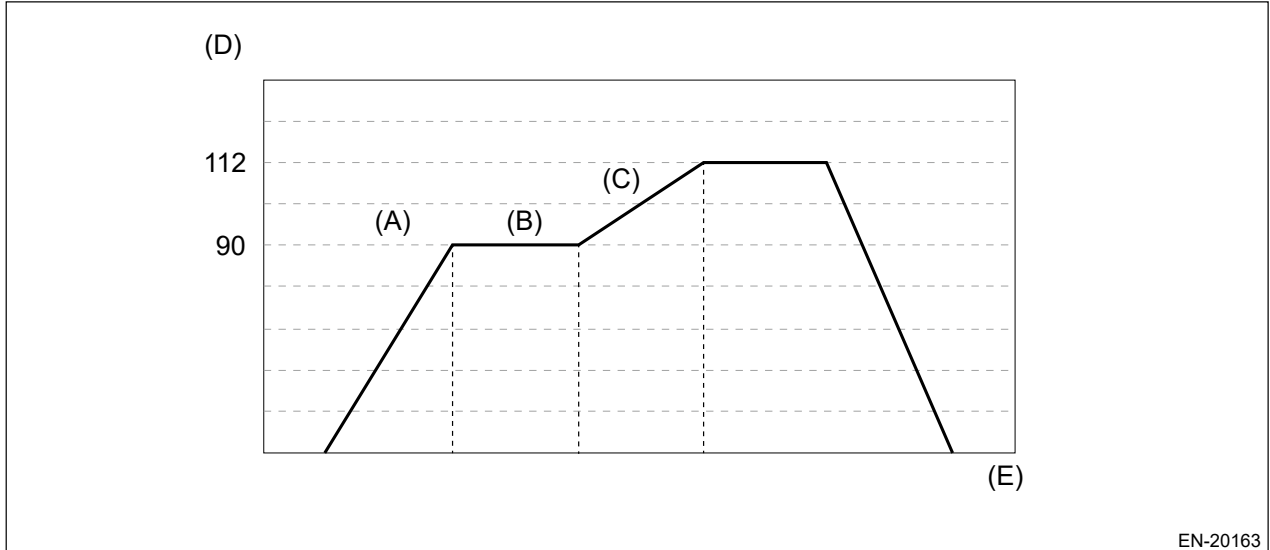
DTC	Item	Condition
P04F0	EVAP SYSTEM HIGH PRESSURE PURGE LINE (CPC2) PERFORMANCE	Remaining fuel level 20 L or more

Diagnostic procedure:

Warning:

When performing drive cycle P on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

1. Drive according to the drive pattern described below.



- (A) Accelerate the vehicle to 80 km/h (50 MPH) or more in a fully warm-up condition.
- (B) Keep a constant vehicle speed (50 km/h (31.1 MPH)) or more for at least five minutes.
- (C) While depressing the accelerator pedal without gear shifting, take at least 10 seconds to accelerate to 112 km/h (70 MPH) or more.
- (E) Sec.
- (D) Vehicle speed km/h (MPH)


2. Park the vehicle on a safe place.

Note:

Driving method while vehicle is driven to a stop at safe place is not restricted.

3. With the vehicle idling, read the temporary diagnostic code of DTC using Subaru Select Monitor or general scan tool.

Note:

- Refer to "Read Diagnostic Trouble Code (DTC)" for detailed operation procedure.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)
- In the step 3), if the DTC is not displayed on the Subaru Select Monitor or general scan tool display screen, the trouble is resolved.

13. DRIVE CYCLE Q

DTC	Item	Condition
P0191	FUEL RAIL PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE BANK 1	<ul style="list-style-type: none">• With the ignition switch ON (engine stopped), read the value in [Coolant Temp.].

		<ul style="list-style-type: none"> • If the engine coolant temperature meets the condition of $\geq 30^{\circ}\text{C}$, idle the engine for 30 minutes or more. • If the engine coolant temperature does not meet the condition of $\geq 30^{\circ}\text{C}$, start the engine, wait until the engine coolant temperature meets the condition of $\geq 30^{\circ}\text{C}$, turn OFF the ignition switch once, then idle the engine for 30 minutes or more. • At least 6 hours must have elapsed since ignition switch was OFF. • For models with block heater, at least 6 hours must have elapsed without operating the block heater.
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Diagnostic procedure:

1. Idle the engine for at least one minute.

Note:

For CVT models, hold the select lever to "P" range or "N" range at idling, and for MT models, the shift lever in the neutral position at idling.

2. Read the temporary code using the Subaru Select Monitor or general scan tool.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)

14. DRIVE CYCLE R

DTC	Item	Condition
P219A	BANK 1 AIR-FUEL RATIO IMBALANCE	—

Warning:

When performing the drive cycle R on the public road, be very careful of the traffic condition and the safe driving must be the high priority.

1. Check the data in condition column of table by using the Subaru Select Monitor or general scan tool.

Note:

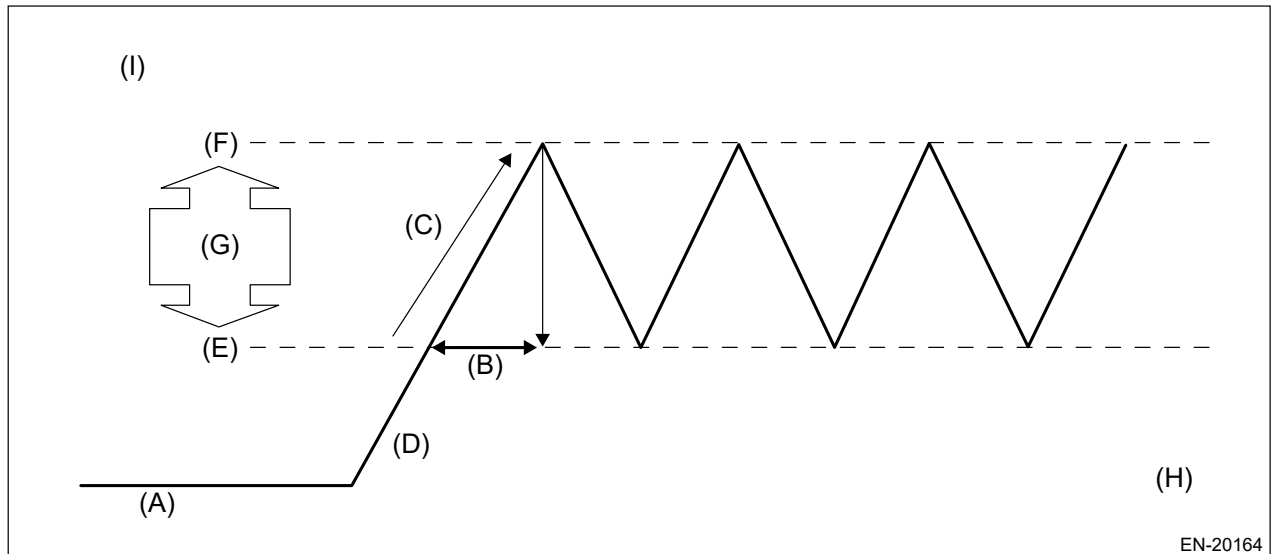
- **Subaru Select Monitor**

For detailed operation procedures, refer to the "Data Monitor".  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

- **General scan tool**

For detailed operation procedures, refer to the general scan tool operation manual.

2. Keep the engine at idle for at least 30 seconds in a fully warm-up condition.
3. Start the driving.
4. With the gear position in the 4th, take 10 seconds to accelerate from 1500 rpm to 4000 rpm.
5. Decelerate to 1500 rpm in the 4th gear position. (There is no restrictions to the deceleration duration and how to use the brake.)
6. Repeat steps 4) and 5) 10 times (end when the temporary code is acquired).




- | | | |
|---|------------------|---|
| (A) Idle the engine for at least 30 seconds in a fully warm-up condition. | (D) Engine speed | (G) Accelerate and decelerate in the 4th gear position. |
| (B) 10 seconds | (E) 1500 rpm | (H) Time |
| (C) Accelerating | (F) 4000 rpm | (I) Accelerating and decelerating |

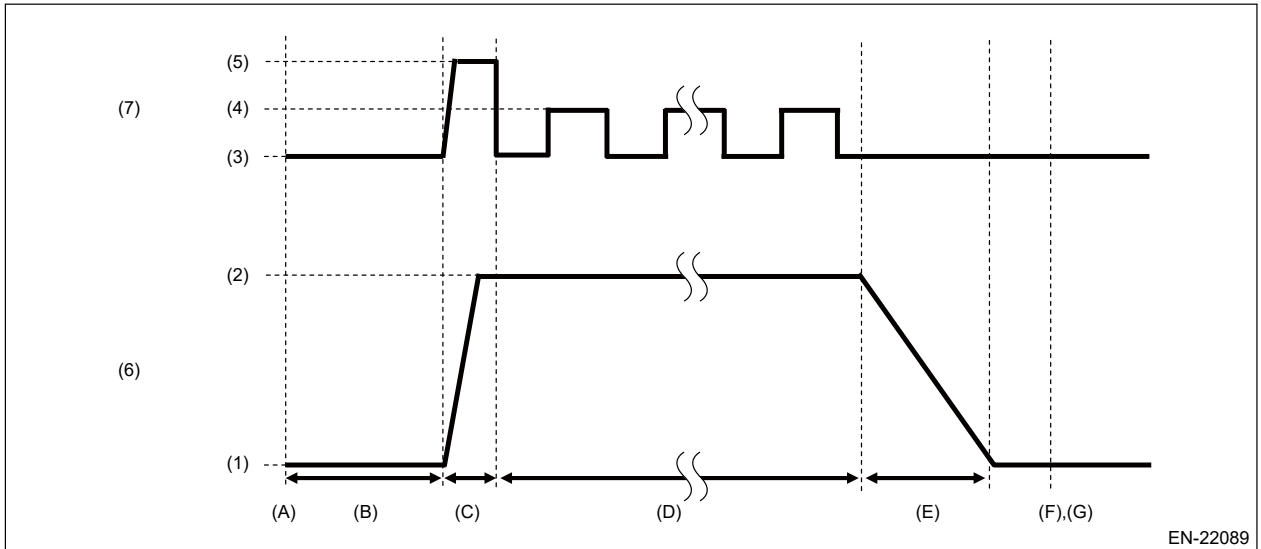
15. DRIVE CYCLE T

Warning:

When performing the drive cycle T on the public road, be very careful of the traffic condition and the safe driving must be the high priority.


Diagnostic procedure:

1. Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 L (5.3—10.6 US gal, 4.4—8.8 Imp gal)].
2. Using the Subaru Select Monitor, clear the memory of [Engine Control System].  Ref. to [ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)
3. Drive according to the drive pattern described below.



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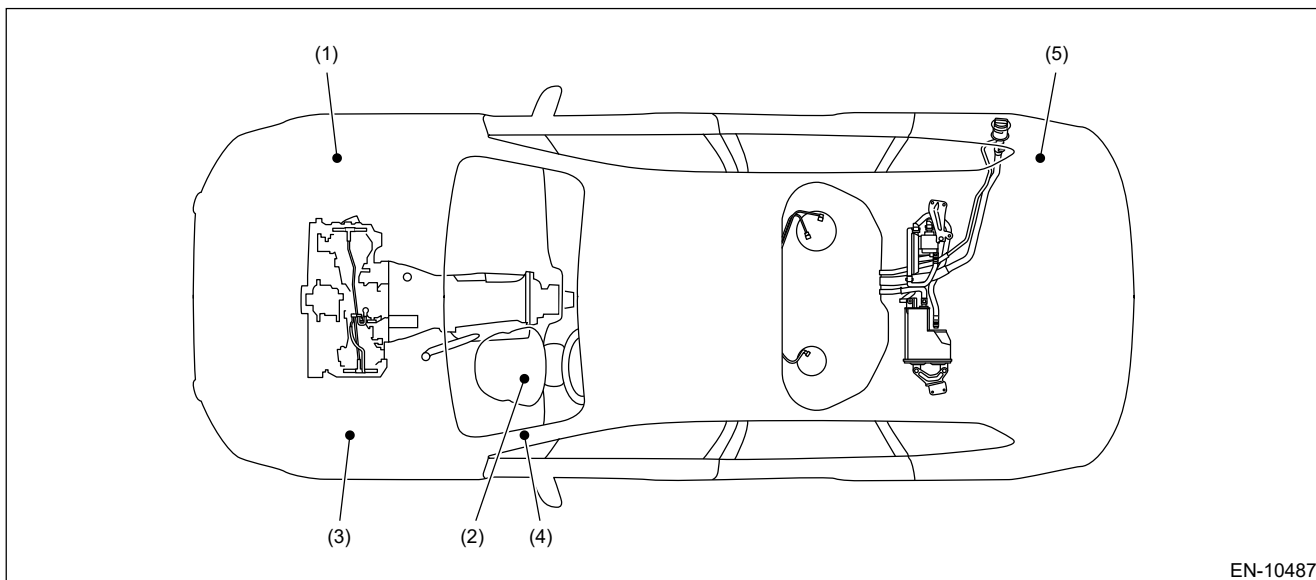
- | | | |
|---|---|-------------------------------------|
| (1) 0 km/h (0 MPH) | (4) 20% | (6) Vehicle speed |
| (2) 60 km/h (37.3 MPH) | (5) 30 — 60% | (7) Accelerator pedal opening angle |
| (3) 0% | | |
| (A) Start the engine after warming up (coolant temperature of 70°C (°F)). | (D) While maintaining vehicle speed at 60 km/h (37.3 MPH), repeat the accelerator opening angle 0% (5 seconds) ←→ 20% (5 seconds) for 20 minutes or more. | (G) Stop the engine. |
| (B) Idle the engine for at least three minutes. | (E) Fully release the accelerator pedal to decelerate the vehicle for at least 5 seconds. | |
| (C) Accelerate the vehicle to 60 km/h (37.3 MPH). | (F) Stop the vehicle. (Driving method while vehicle is driven to a stop at safe place is not restricted) | |

4. Read the temporary code using the Subaru Select Monitor or general scan tool.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)

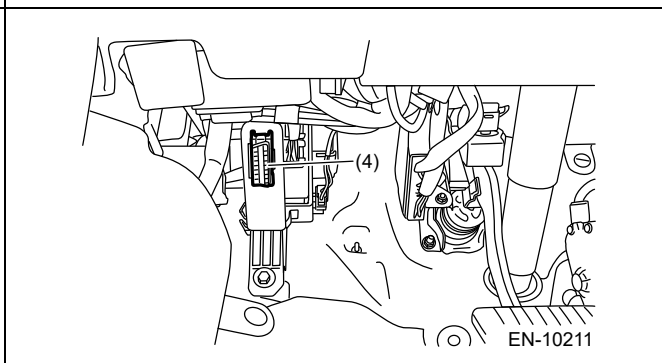
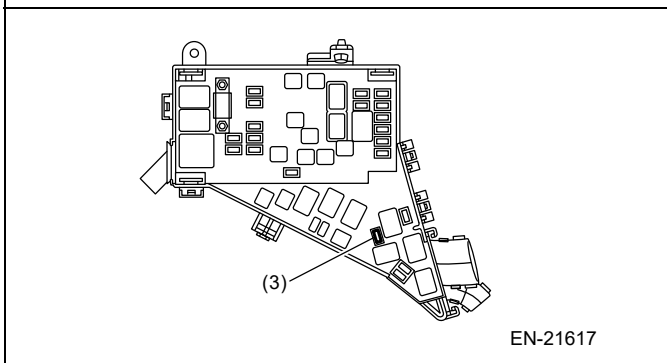
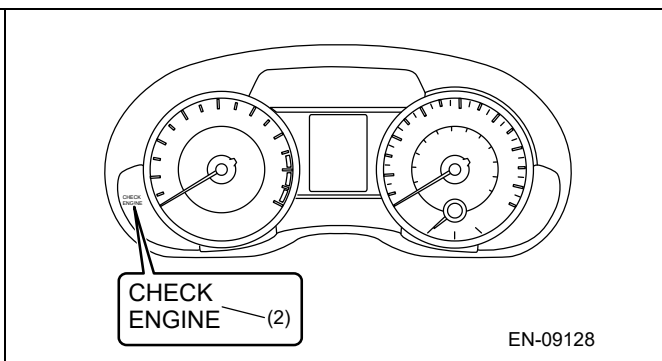
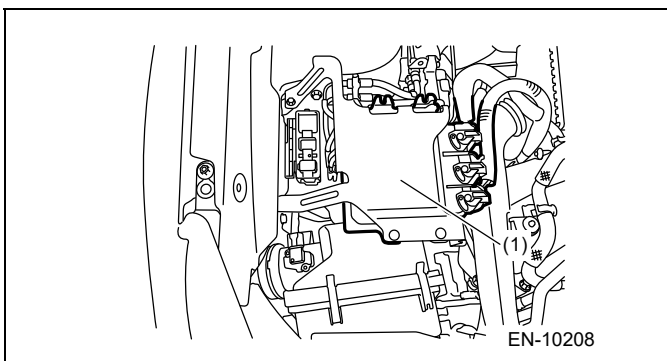
ENGINE (DIAGNOSTICS)(H4DOTC) > Electrical Component Location

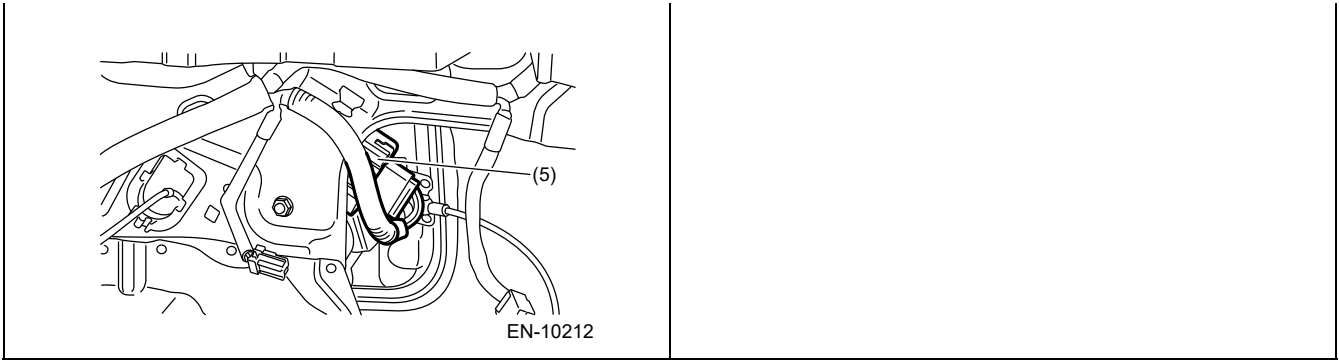
LOCATION

1. CONTROL MODULE

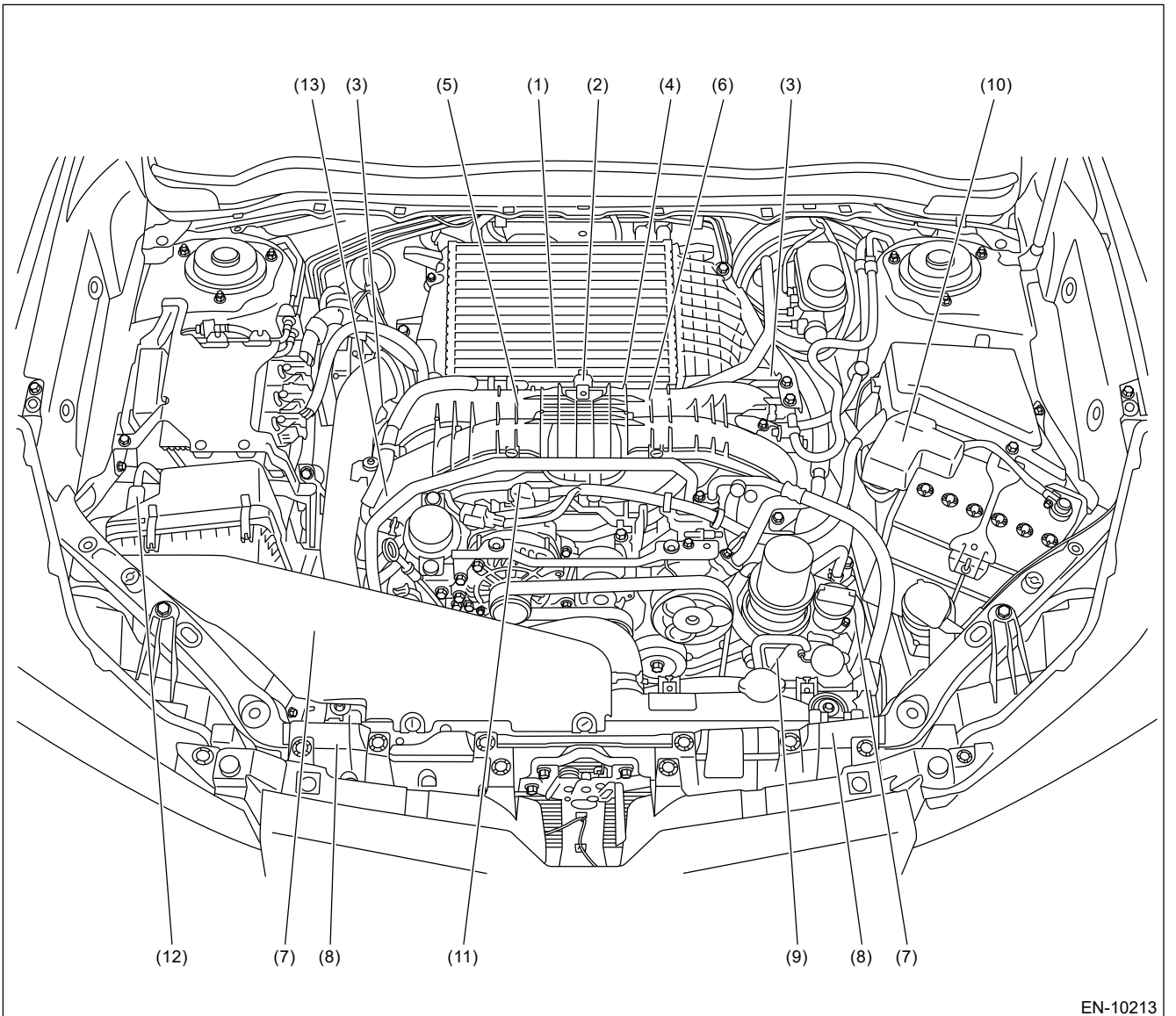


- (1) Engine control module (ECM)
- (2) Malfunction indicator light
- (3) Delivery mode fuse
- (4) Data link connector
- (5) Fuel pump CM





2. SENSOR



- | | | |
|--|-------------------------------------|--|
| (1) Electronic throttle control | (6) Knock sensor LH | (11) Engine coolant temperature sensor |
| (2) Manifold absolute pressure and intake air temperature sensor | (7) Intake camshaft position sensor | (12) Mass air flow and intake air temperature sensor |

(3) Tumble generator valve actuator (with built-in sensor)

(4) Crankshaft position sensor

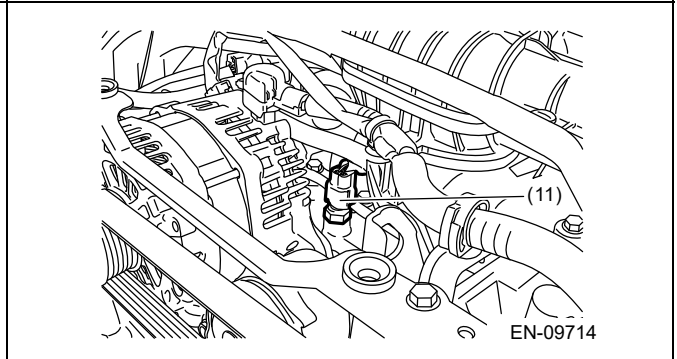
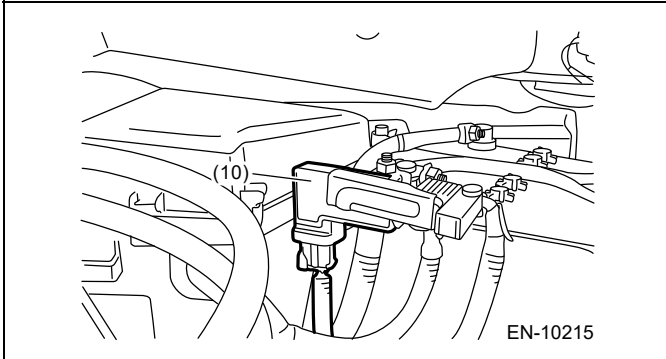
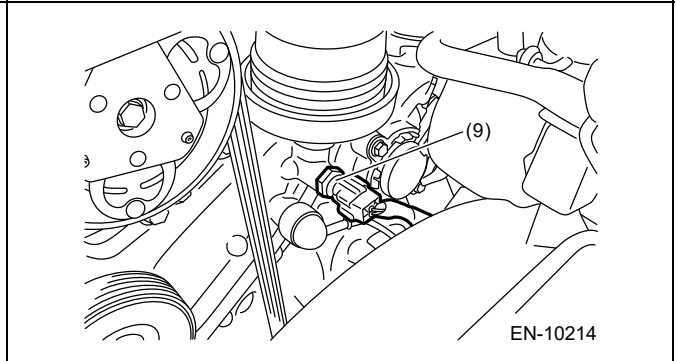
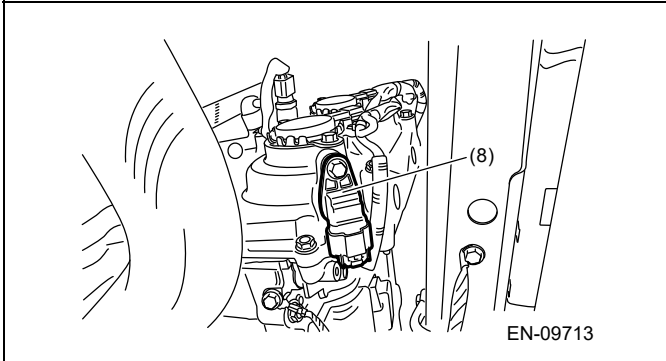
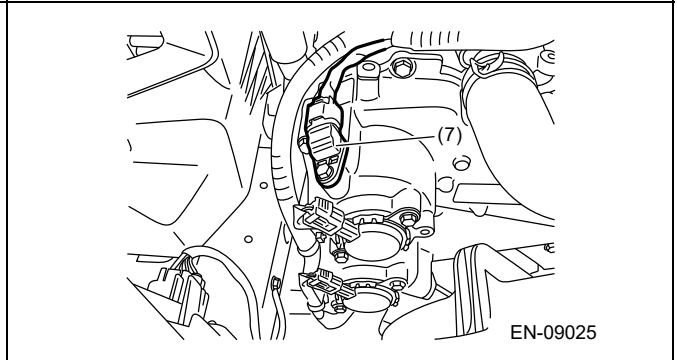
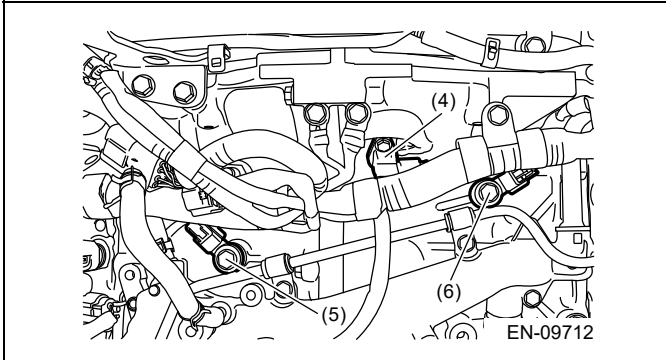
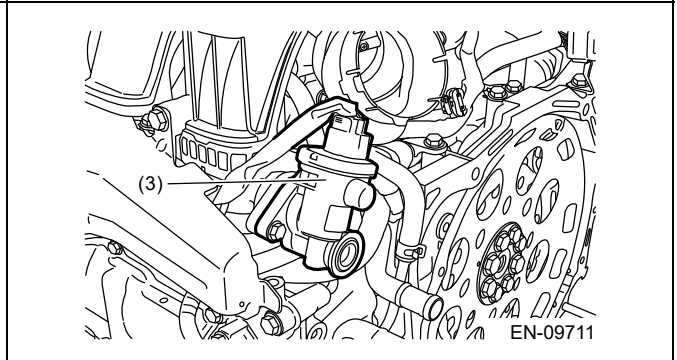
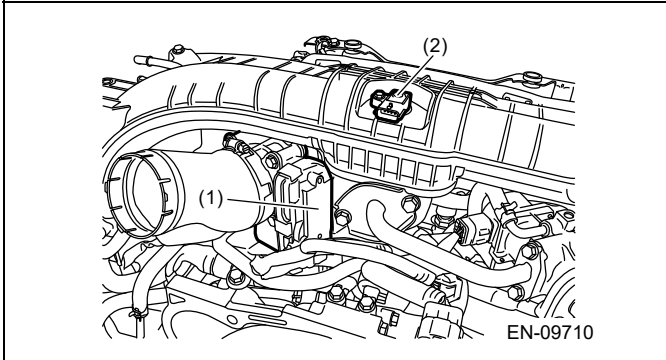
(5) Knock sensor RH

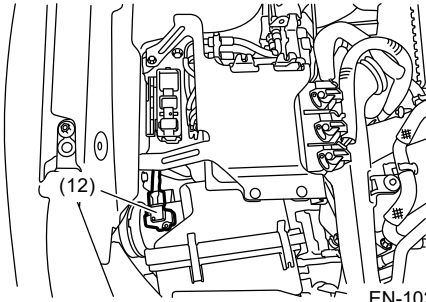
(8) Exhaust camshaft position sensor

(9) Engine oil temperature sensor

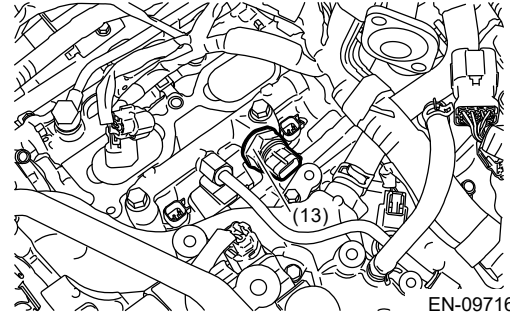
(10) Battery current & temperature sensor

(13) Fuel pressure sensor

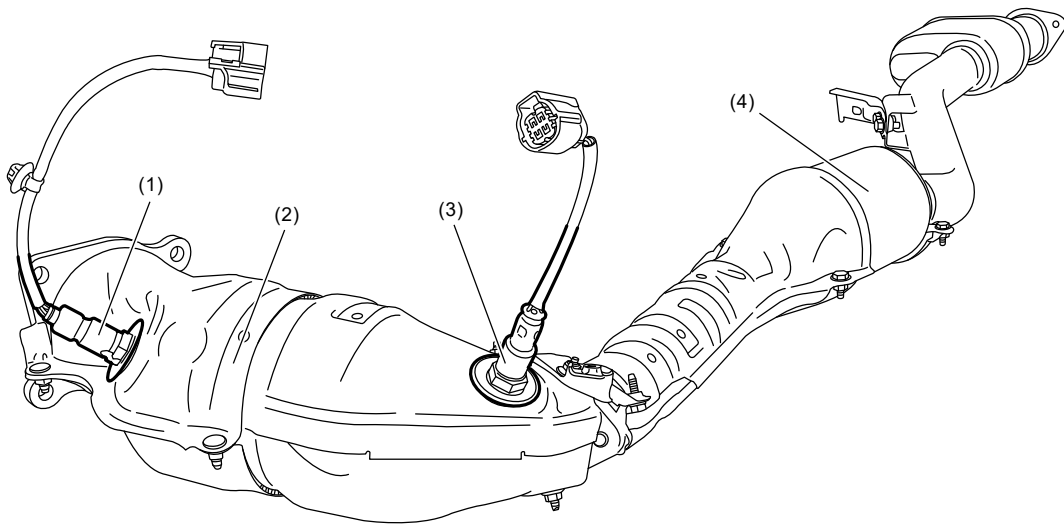




EN-10216

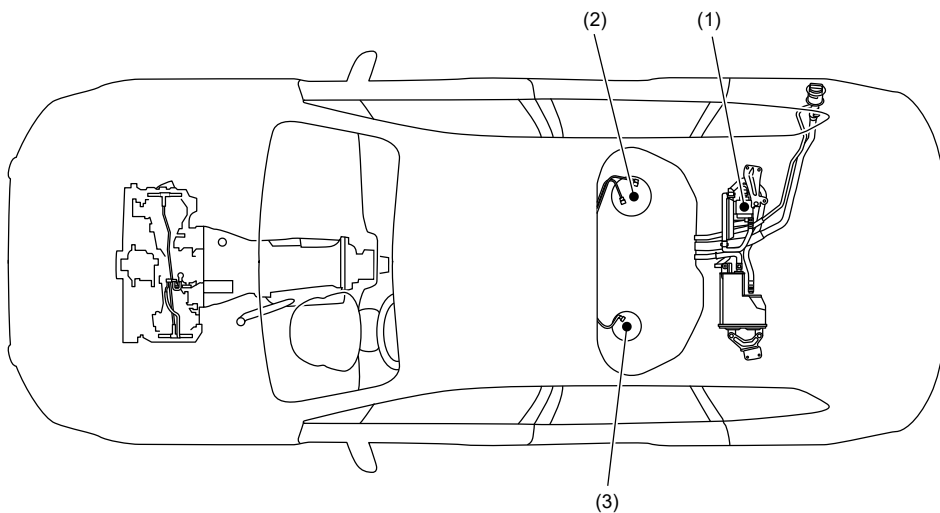


EN-09716



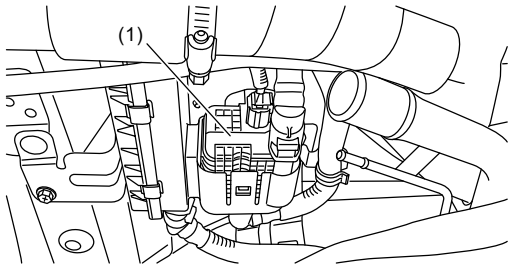
EN-09717

- (1) Front oxygen (A/F) sensor
- (2) Front catalytic converter
- (3) Rear oxygen sensor
- (4) Rear catalytic converter

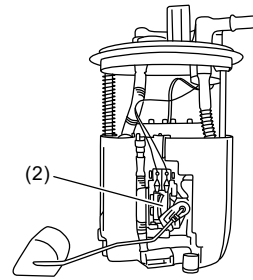


EN-10488

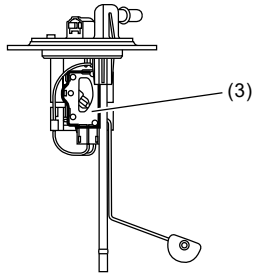
- (1) Leak check valve ASSY (with built-in pressure sensor)
- (2) Fuel level sensor
- (3) Fuel sub level sensor



EN-10472

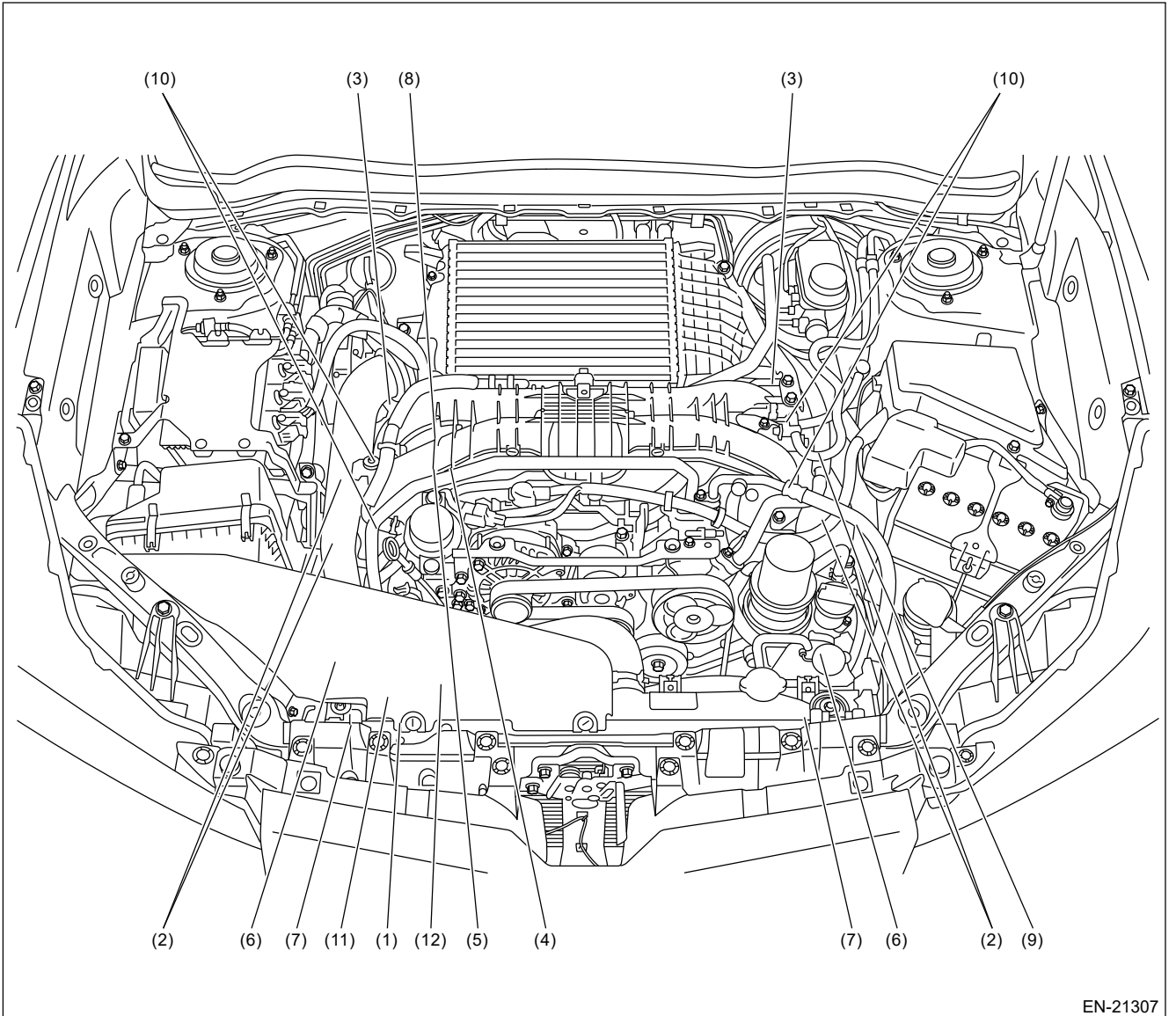


EN-10473



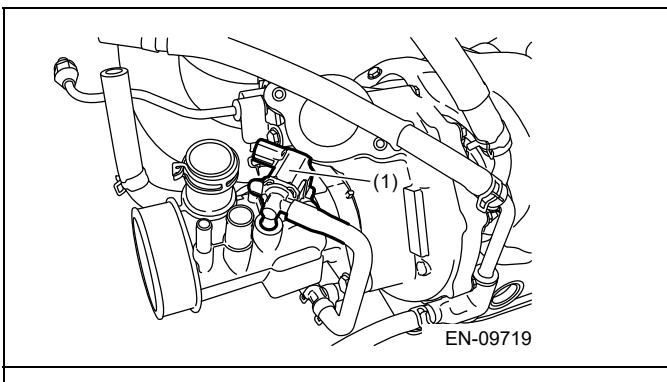
EN-08790

3. SOLENOID VALVE, ACTUATOR, EMISSION CONTROL SYSTEM PARTS AND IGNITION SYSTEM PARTS

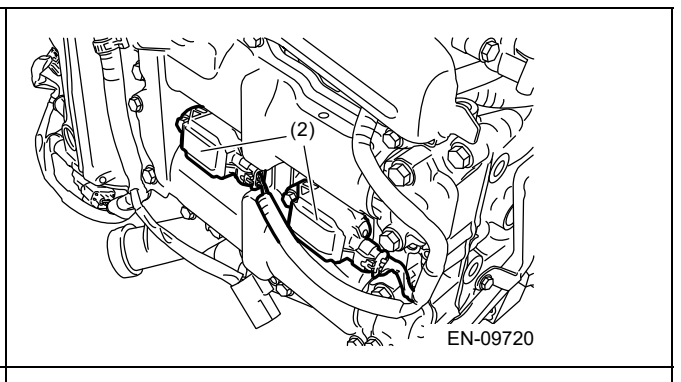


EN-21307

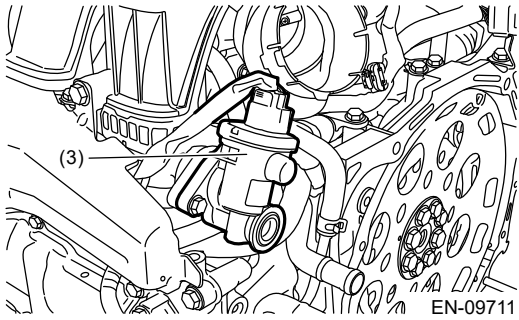
- | | | |
|--------------------------------------|------------------------------------|------------------------------------|
| (1) Wastegate control solenoid valve | (5) Purge control solenoid valve 2 | (9) High-pressure fuel pump valve |
| (2) Ignition coil | (6) Intake oil control solenoid | (10) Fuel injector |
| (3) Tumble generator valve actuator | (7) Exhaust oil control solenoid | (11) Blow-by diagnosis connector 1 |
| (4) Purge control solenoid valve 1 | (8) EGR control valve | (12) Blow-by diagnosis connector 2 |



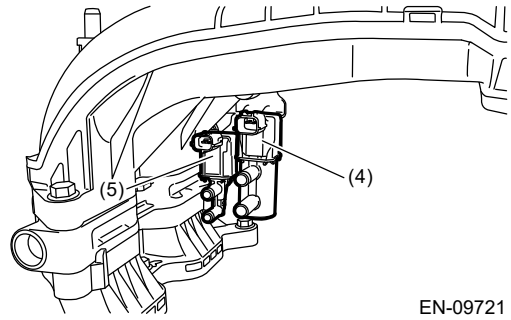
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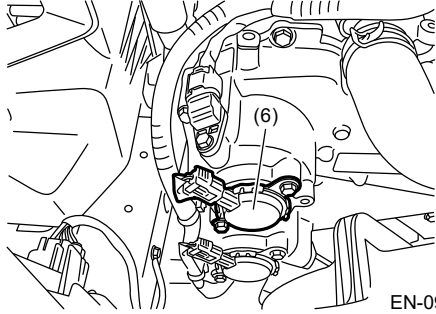
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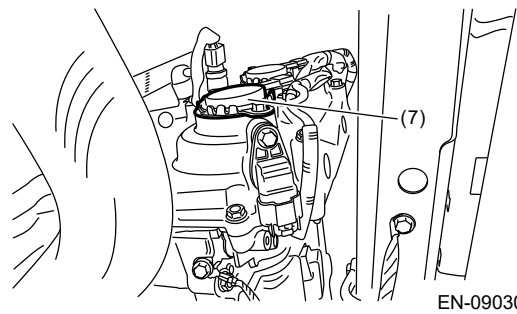
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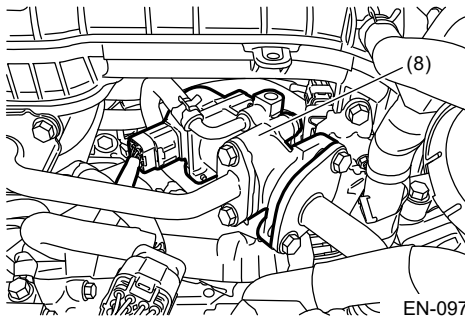
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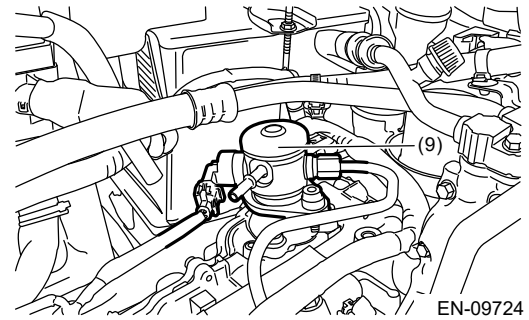
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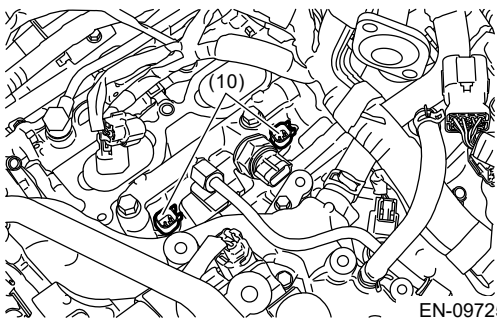
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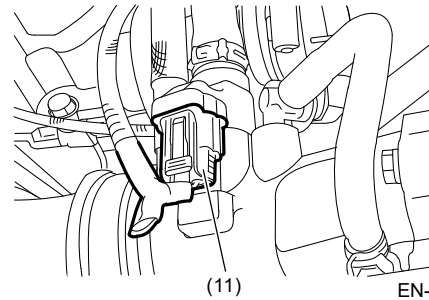
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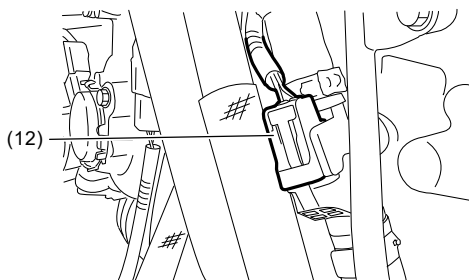
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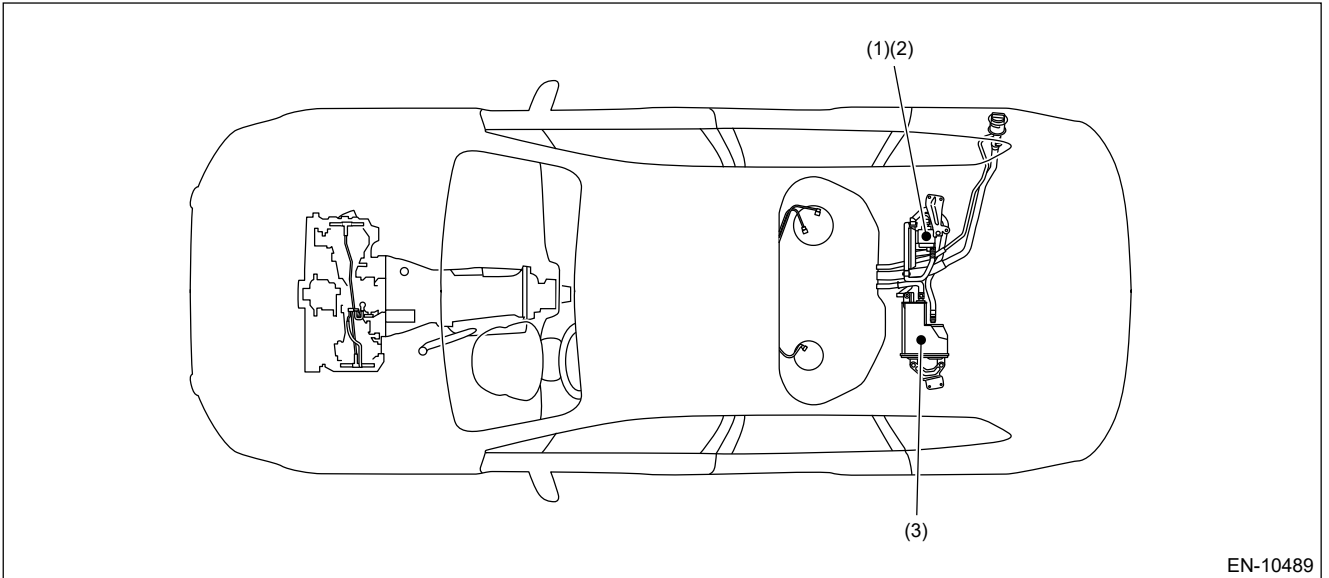
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EN-21155



EN-21154

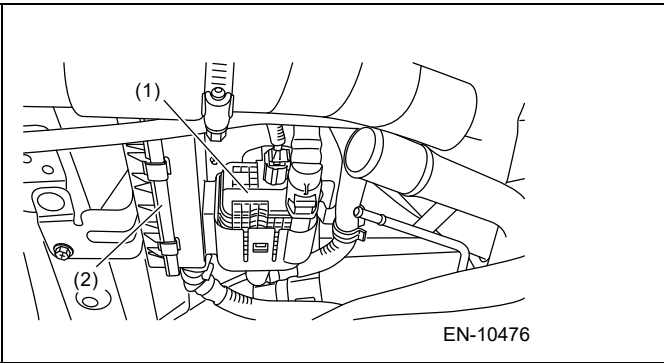


EN-10489

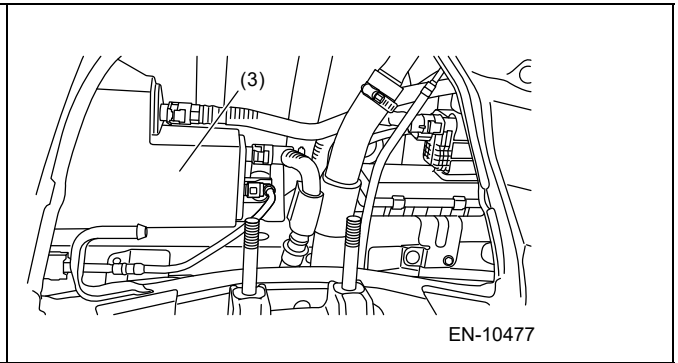
(1) Leak check valve ASSY

(2) Drain filter

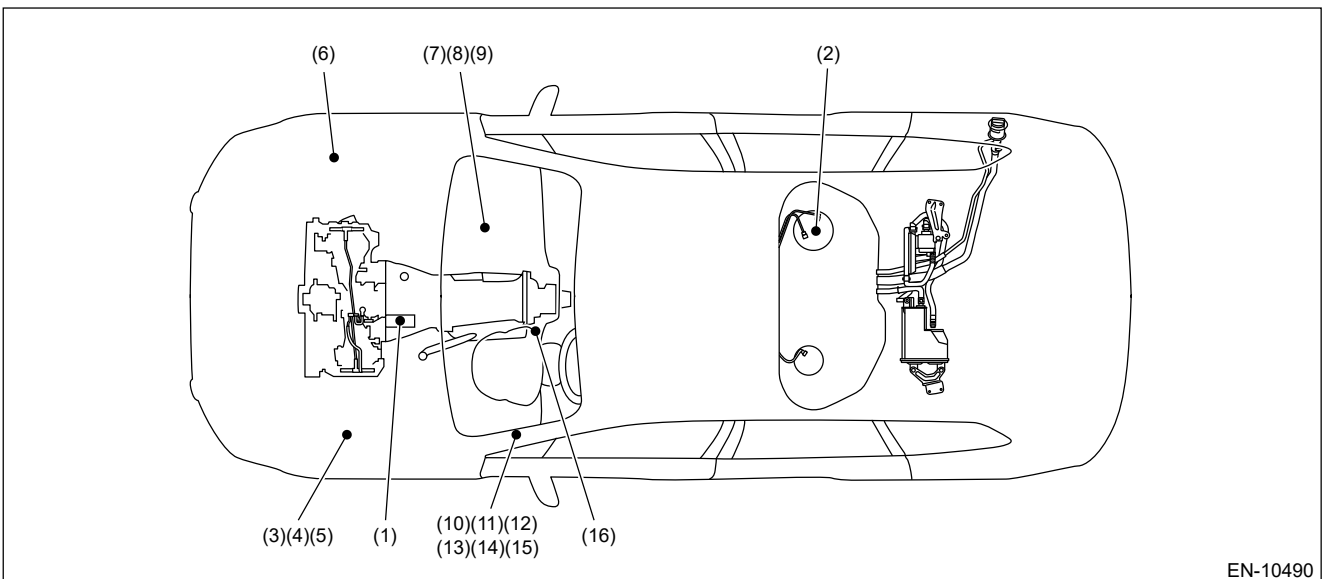
(3) Canister



EN-10476



EN-10477



EN-10490

(1) Starter

(7) Fuel pump relay

(12) Starter relay

(2) Fuel pump

(8) Main relay

(13) Starter cut relay (model with push button start)

(3) Radiator main fan relay 1

(9) IG relay

(14) IG relay 1 (push button start)

(4) Radiator main fan relay 2

(10) A/F, oxygen sensor relay

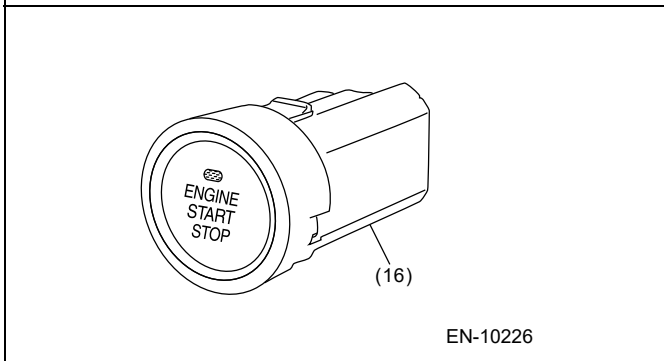
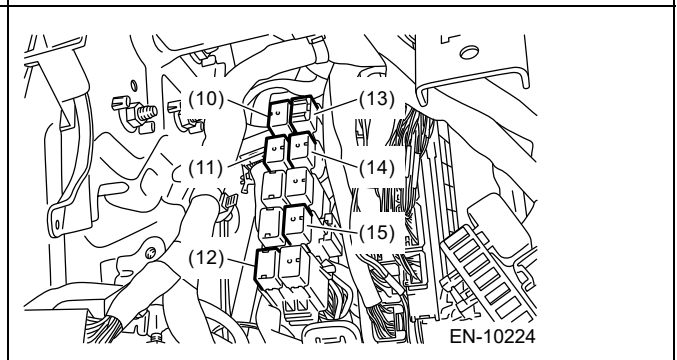
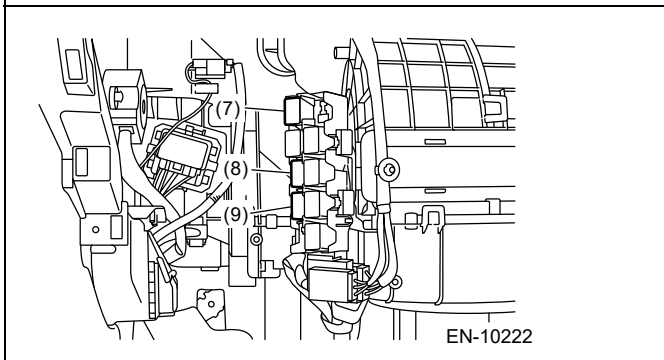
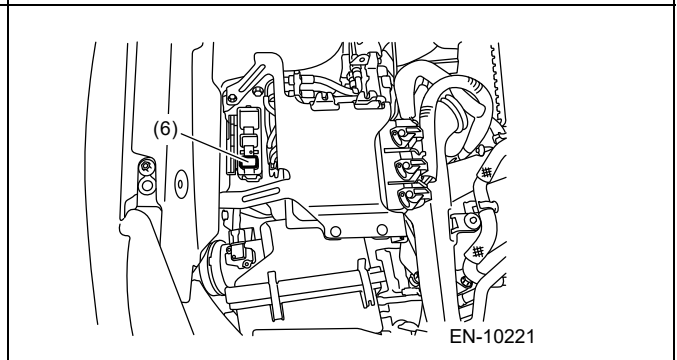
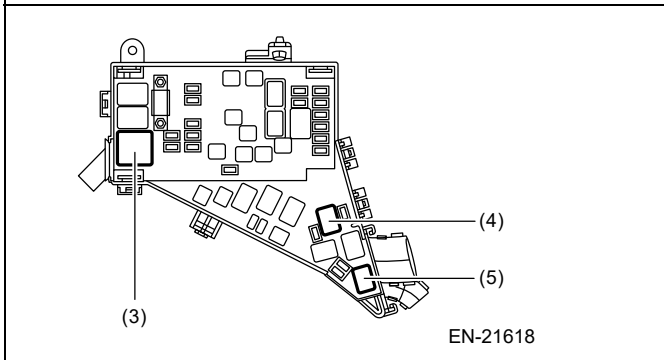
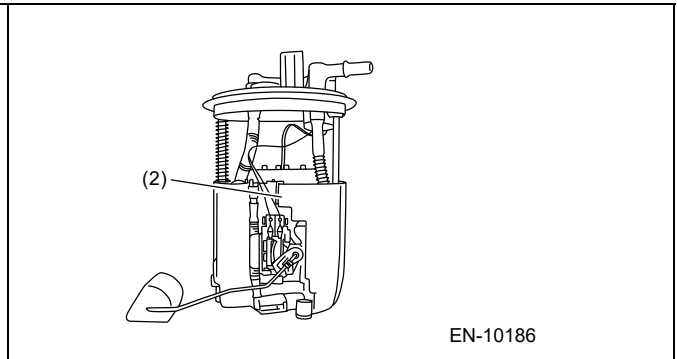
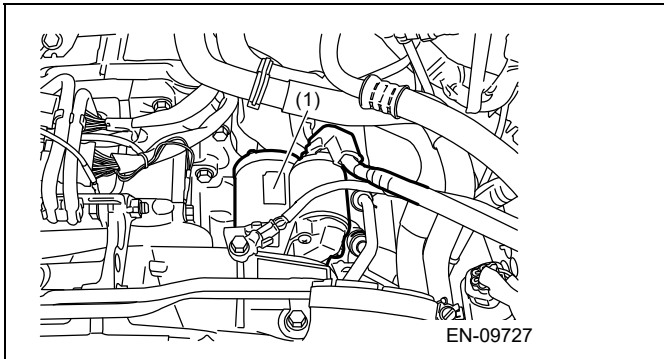
(model with push button start)
(15) Starter relay (push button start) (model with push button start)

(5) Radiator sub fan relay

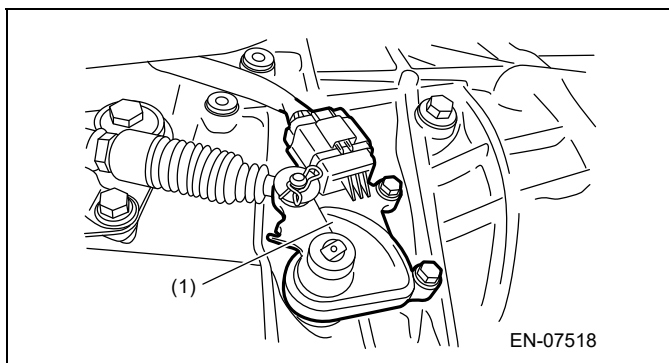
(11) Electronic throttle control relay

(16) Push button ignition switch (model with push button start)

(6) Fuel injector relay



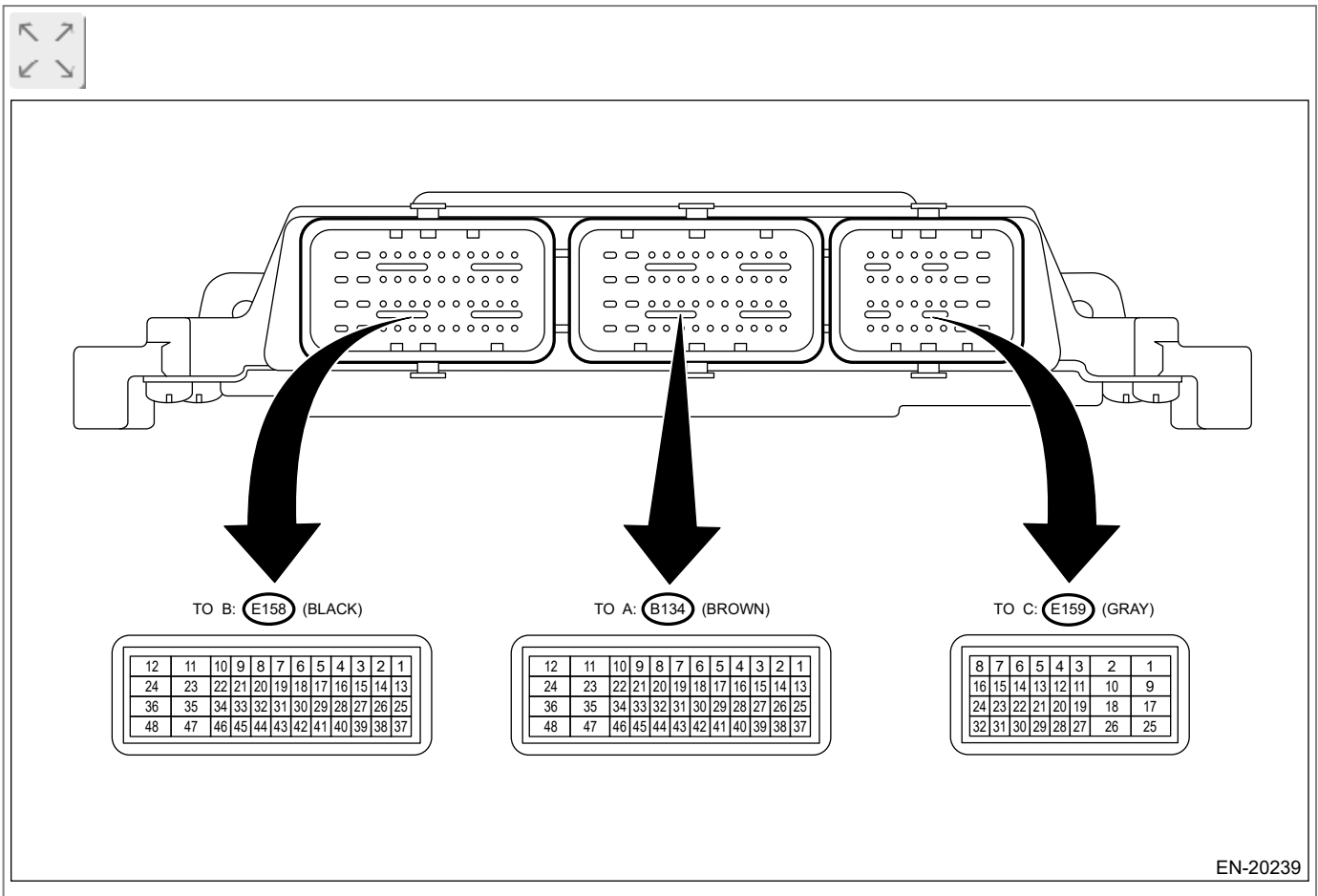
4. TRANSMISSION



(1) Inhibitor switch

ENGINE (DIAGNOSTICS)(H4DOTC) > Engine Control Module (ECM) I/O Signal

ELECTRICAL SPECIFICATION



Description	Connect or No.	Terminal No.	Signal (V)		Remarks	
			Ignition SW ON (Engine OFF)	Engine ON (Idling)		
Crankshaft position sensor	(+) signal	E158	19	0 or 5	0 or 5	*1: Waveform
	Ground	E158	31	0	0	—
Intake camshaft position sensor LH	E158	21	0 or 5	0 or 5	0 or 5	*1: Waveform
Intake camshaft position sensor RH	E158	20	0 or 5	0 or 5	0 or 5	*1: Waveform
Exhaust camshaft position sensor LH	E158	33	0 or 5	0 or 5	0 or 5	*1: Waveform
Exhaust camshaft position sensor RH	E158	32	0 or 5	0 or 5	0 or 5	*1: Waveform
Camshaft position sensor ground	E158	34	0	0	0	—

Front oxygen (A/F) sensor	IP (+) signal	E158	15	1.7	3.3	Waveform
	VS (+) signal	E158	27	2.2	4	Waveform
	COM signal	E158	39	9.8	3.6	Waveform
	Heater signal	E159	9	Battery voltage	0 or battery voltage	Waveform
Rear oxygen sensor	Signal (+)	E158	16	0.3	0.1 – 0.9	Waveform
	Signal (–)	E158	42	2	2	–
	Heater signal	E159	3	Battery voltage	0 or battery voltage	Waveform
Air flow sensor	Signal	B134	16	0.3	1.2	–
	Ground	B134	28	0	0	–
Intake air temperature sensor (integrated with air flow sensor)		E158	5	2.7	3	–
Engine coolant temperature sensor		E158	38	2.7	1.8	–
Engine oil temperature sensor		E158	2	2.9	2.1	–
Manifold absolute pressure sensor		E158	4	1.9	0.8	–
Intake air temperature sensor (integrated with manifold absolute pressure sensor)		E158	25	3	3	–
Fuel pressure sensor		E158	6	2	1	–
Knock sensor 1		E158	14	2.5	2.5	Waveform
Knock sensor 2		E158	26	2.5	2.5	Waveform
Battery temperature sensor		B134	41	2.2	2.1	–
Battery current sensor		B134	42	2.7	2.1	–
Accelerator pedal position sensor	Main power supply	B134	30	5	5	–
	Main signal	B134	17	Fully closed: 0.4 – 1	Fully closed: 0.4 – 1	–

				Fully open: 2.4 — 3.7	Fully open: 2.4 — 3.7	
	Main ground	B134	31	0	0	—
	Sub signal	B134	29	Fully closed: 0.4 — 1 Fully open: 2.4 — 3.7	Fully closed: 0.4 — 1 Fully open: 2.4 — 3.7	—
Tumble generator valve actuator RH	Position signal	E158	40	0.43 — 1.19	Closing direction: 2.38 — 3.93 Opening direction: 0.43 — 1.19	—
	Motor open	E159	14	Battery voltage	0 or battery voltage	Waveform
	Motor closed	E159	30	Battery voltage	0 or battery voltage	Waveform
Tumble generator valve actuator LH	Position signal	E158	41	2.38 — 3.93	Closing direction: 0.43 — 1.19 Opening direction: 2.38 — 3.93	—
	Motor open	E159	6	Battery voltage	0 or battery voltage	Waveform
	Motor closed	E159	22	Battery voltage	0 or battery voltage	Waveform
Intake oil control solenoid RH		E159	7	Battery voltage	0 or battery voltage	Waveform
Intake oil control solenoid LH		E159	15	Battery voltage	0 or battery voltage	Waveform
Exhaust oil control solenoid RH		E159	23	Battery voltage	0 or battery voltage	Waveform
Exhaust oil control solenoid LH		E159	31	Battery voltage	0 or battery voltage	Waveform
Wastegate control solenoid valve		E159	11	Battery voltage	Battery voltage	—
Canister purge control solenoid valve 1		E159	4	Battery voltage	0 or battery voltage	Waveform
Canister purge control solenoid valve 2		E159	12	Battery voltage	0 or battery voltage	Waveform
Ignition control	#1	E159	8	0	0 or 5	Waveform

	#2	E159	16	0	0 or 5	Waveform
	#3	E159	24	0	0 or 5	Waveform
	#4	E159	32	0	0 or 5	Waveform
EGR control valve	A+	E159	5	Battery voltage	0 or battery voltage	—
	A-	E159	21	Battery voltage	0 or battery voltage	—
	B+	E159	13	Battery voltage	0 or battery voltage	—
	B-	E159	29	Battery voltage	0 or battery voltage	—
Fuel pump control unit	Control signal	B134	40	Battery voltage	0 or battery voltage	Waveform
	Diagnostic signal	B134	44	0	Battery voltage	—
High-pressure fuel pump (Hi)		E158	10	2.4	0 or battery voltage	Waveform
High-pressure fuel pump (Lo)		E158	22	2.4	0 or battery voltage	Waveform
Fuel injector	Power supply 1	B134	36	Battery voltage	Battery voltage	—
	Power supply 2	B134	48	Battery voltage	Battery voltage	—
	#1 (+)	E158	11	2.4	—	Measurement is prohibited while the engine is running.
	#1 (-)	E158	12	2.4	—	
	#2 (+)	E158	23	2.4	—	
	#2 (-)	E158	24	2.4	—	
	#3 (+)	E158	35	2.4	—	
	#3 (-)	E158	36	2.4	—	
	#4 (+)	E158	47	2.4	—	
#4 (-)	E158	48	2.4	—		
Electronic throttle control	Sensor power supply	E158	18	5	5	—
	Main signal	E158	17	Fully closed: Approx. 0.7 Fully open: Approx. 3.9	Fully closed: Approx. 0.7 Fully open: Approx. 3.9	—
	Sub signal	E158	29	Fully closed: Approx. 4.4 Fully open: Approx. 1.1	Fully closed: Approx. 4.4 Fully open: Approx. 1.1	—

	Ground	E158	30	0	0	—
	Motor power supply	B134	11	Battery voltage	Battery voltage	—
Electronic throttle control motor (+)		E159	2	0	0 or battery voltage	—
Electronic throttle control motor (-)		E159	1	0	0 or battery voltage	—
Electronic throttle relay control		B134	39	0	0	—
Starter relay control		B134	14	2.9	2.9	—
Self-shutoff relay control		B134	38	0	0	—
Starter cut relay control		B134	13	0	0	Model with push button start
Main fan relay control		B134	37	Battery voltage	0 or battery voltage	—
Sub fan relay control		B134	25	Battery voltage	0 or battery voltage	—
A/C relay control		B134	1	Battery voltage	0 or battery voltage	—
A/C switch		B134	21	ON: Battery voltage OFF: 0	ON: Battery voltage OFF: 0	Manual A/C model
Blower fan switch		B134	22	ON: 0 OFF: Battery voltage	ON: 0 OFF: Battery voltage	Manual A/C model
Starter switch		B134	45	0	0	Model with push button start Cranking: Waveform
Starter switch 2		B134	8	0	0	Cranking: Battery voltage
Ignition switch		B134	32	Battery voltage	Battery voltage	—
Pressure switch		B134	7	Battery voltage	Battery voltage	—
Neutral position switch		B134	33	ON: 0 OFF: Battery voltage	ON: 0 OFF: Battery voltage	Switch is ON when select lever is in "P" range or "N" range.
Cruise control	Main switch	B134	20	ON: 0 OFF: 5	ON: 0 OFF: 5	—
	Command switch	B134	6	When operating nothing: 3.5 — 4.5	When operating nothing: 3.5 — 4.5	—

				When operating RES/+: 2.5 — 3.5 When operating SET/–: 0.5 — 1.5 When operating CANCEL: 0 — 0.5	When operating RES/+: 2.5 — 3.5 When operating SET/–: 0.5 — 1.5 When operating CANCEL: 0 — 0.5	
Brake switch 1 (Brake switch)	B134	43	When brake pedal is depressed: 0 When brake pedal is released: Battery voltage	When brake pedal is depressed: 0 When brake pedal is released: Battery voltage	—	
Brake switch 2 (Stop light switch)	E158	8	When brake pedal is depressed: Battery voltage When brake pedal is released: 0	When brake pedal is depressed: Battery voltage When brake pedal is released: 0	—	
Oil level switch	E158	44	0	0	Oil level LOW: Battery voltage	
Accessory cut request	B134	2	Battery voltage	Battery voltage	Model with push button start Cranking: 0	
Engine speed output	B134	4	Battery voltage	0 or battery voltage	Model with push button start Waveform	
Generator control	B134	26	1.8	1.8	—	
CAN communication	(Hi)	B134	10	—	—	
	(Lo)	B134	9	—	—	
Blow-by leak diagnosis	E158	7	0	0	At the time of open circuit (fault): 5	
Immobilizer communication	E158	43	—	—	—	
Delivery mode switch	E158	45	Battery voltage	Battery voltage	—	
Control module power supply	B134	12	Battery voltage	Battery voltage	—	
	B134	24	Battery voltage	Battery voltage	—	
Backup power supply	B134	23	Battery voltage	Battery voltage	—	
Sensor power supply	B134	18	5	5	—	

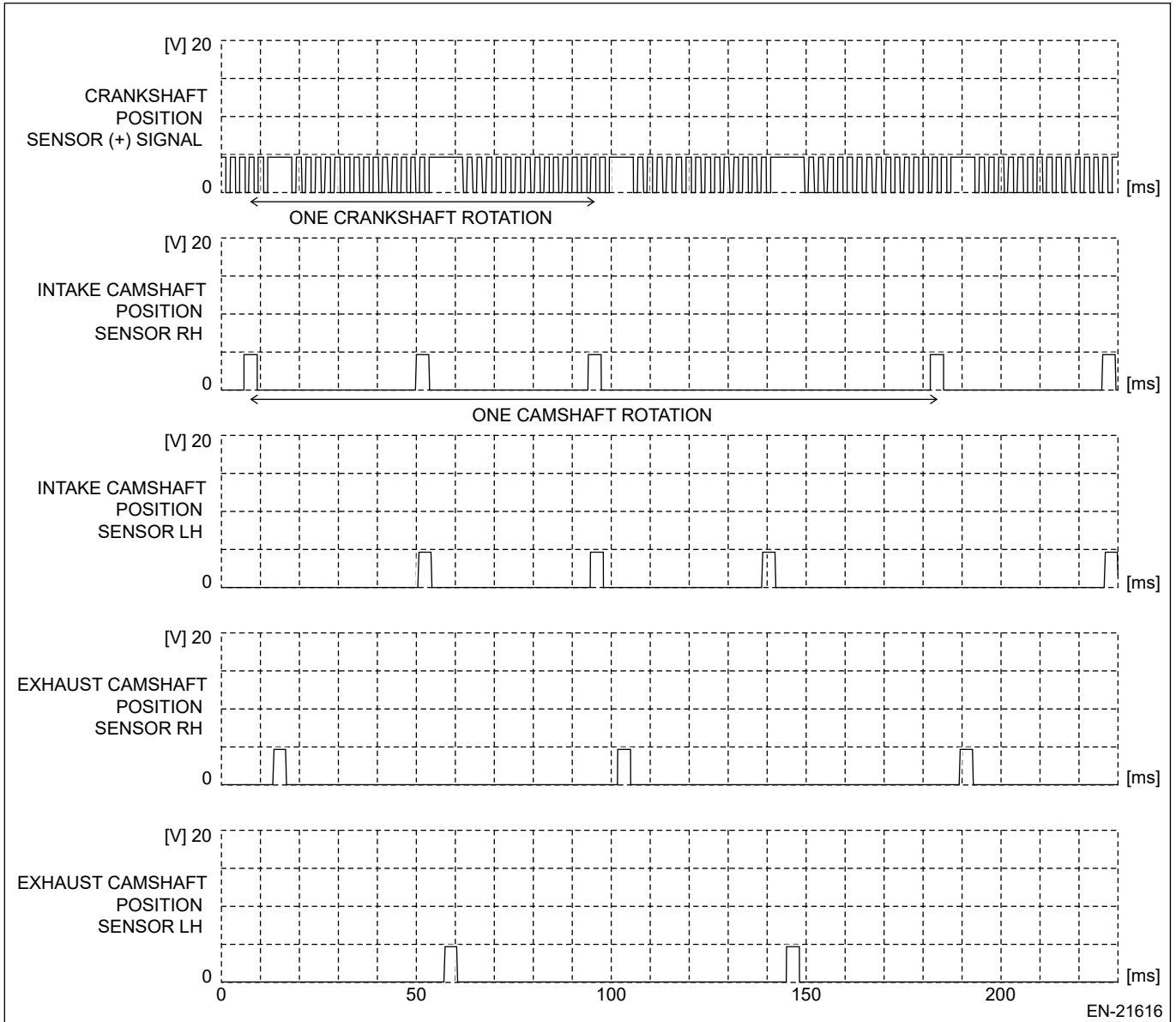
		E159	19	5	5	—
Leak check valve ASSY	Switching valve	B134	27	Battery voltage	Battery voltage	Operating: 0
	Pressure sensor	B134	15	1 — 4	1 — 4	When ignition switch is turned to ON: atmospheric pressure
	Vacuum pump	B134	3	Battery voltage	Battery voltage	Operating: 0
Brake booster pressure sensor		E158	13	0.8 — 1.2	1 — 1.6	When brake pedal is released.
Brake vacuum pump		E158	1	0	0	—
Brake vacuum pump relay		E158	37	Battery voltage	Battery voltage	—
Sensor ground		B134	19	0	0	—
		E159	27	0	0	—
Ground	Engine 1	B134	35	0	0	—
	Engine 2	B134	47	0	0	—
	Engine 3	E159	10	0	0	—
	Engine 4	E159	18	0	0	—
	Engine 5	E159	26	0	0	—
	Engine 6	E159	17	0	0	—
	Engine 7	E159	25	0	0	—

Measuring condition:

Note:

- For measurement of the waveform of the crankshaft position sensor, we recommend using the DST-i oscilloscope function or a general oscilloscope.
- Perform measurement after warming up the engine.
- Set the select lever in "P" range or "N" range, or the shift lever in neutral.
- Turn the A/C to OFF.
- Turn all the accessory switches to OFF.
- At idling

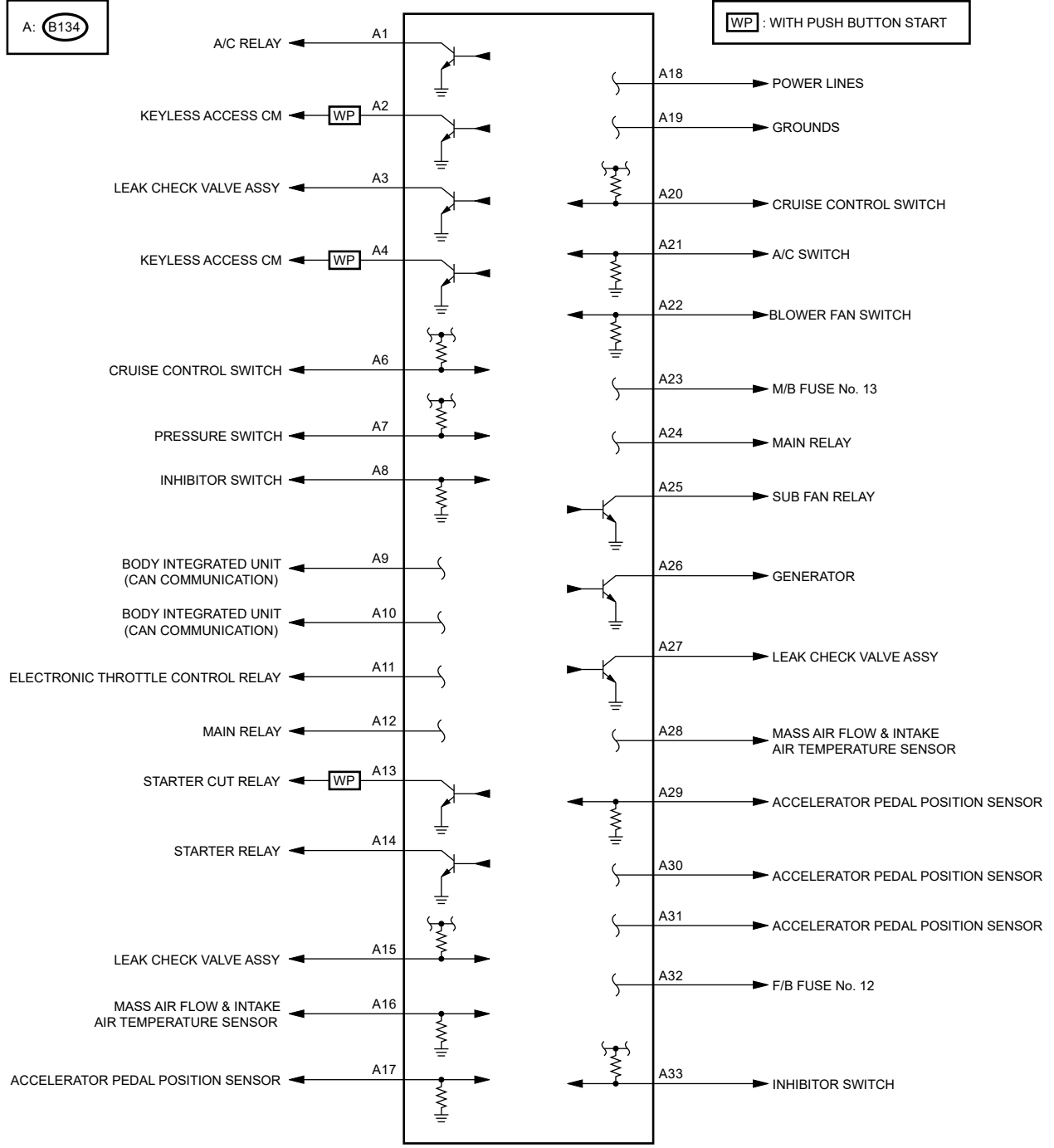
***1: Waveform**



Measured terminal	Crankshaft position sensor (+) signal (E158) No. 19 (+) — Engine ground 3 (E159) No. 10:
	Intake camshaft position sensor RH (E158) No. 20 (+) — Engine ground 3 (E159) No. 10:
	Intake camshaft position sensor LH (E158) No. 21 (+) — Engine ground 3 (E159) No. 10:
	Exhaust camshaft position sensor RH (E158) No. 32 (+) — Engine ground 3 (E159) No. 10:
	Exhaust camshaft position sensor LH (E158) No. 33 (+) — Engine ground 3 (E159) No. 10:
Measuring condition	While engine idling

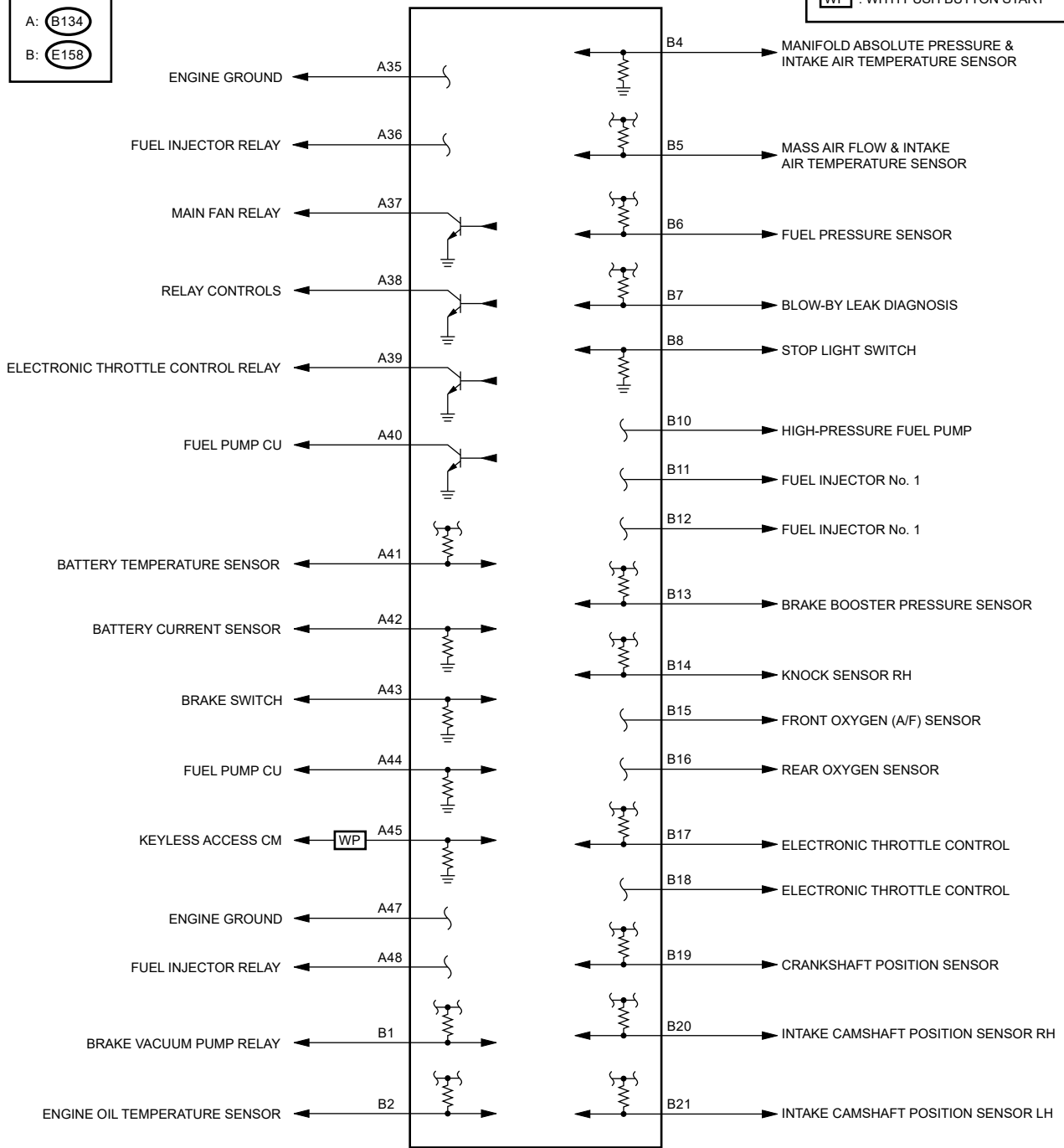
A: B134

WP : WITH PUSH BUTTON START



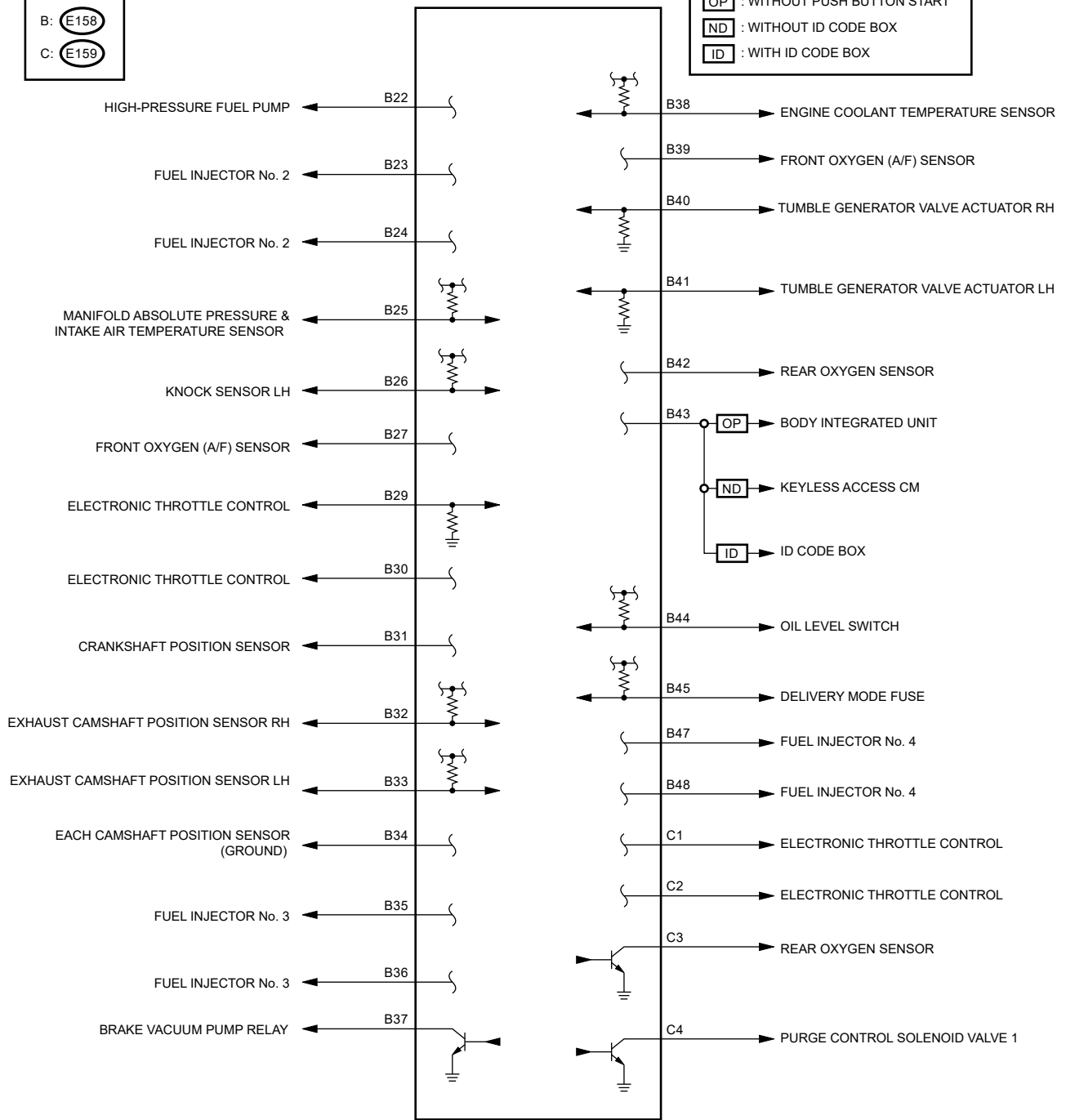
A: B134
B: E158

WP : WITH PUSH BUTTON START

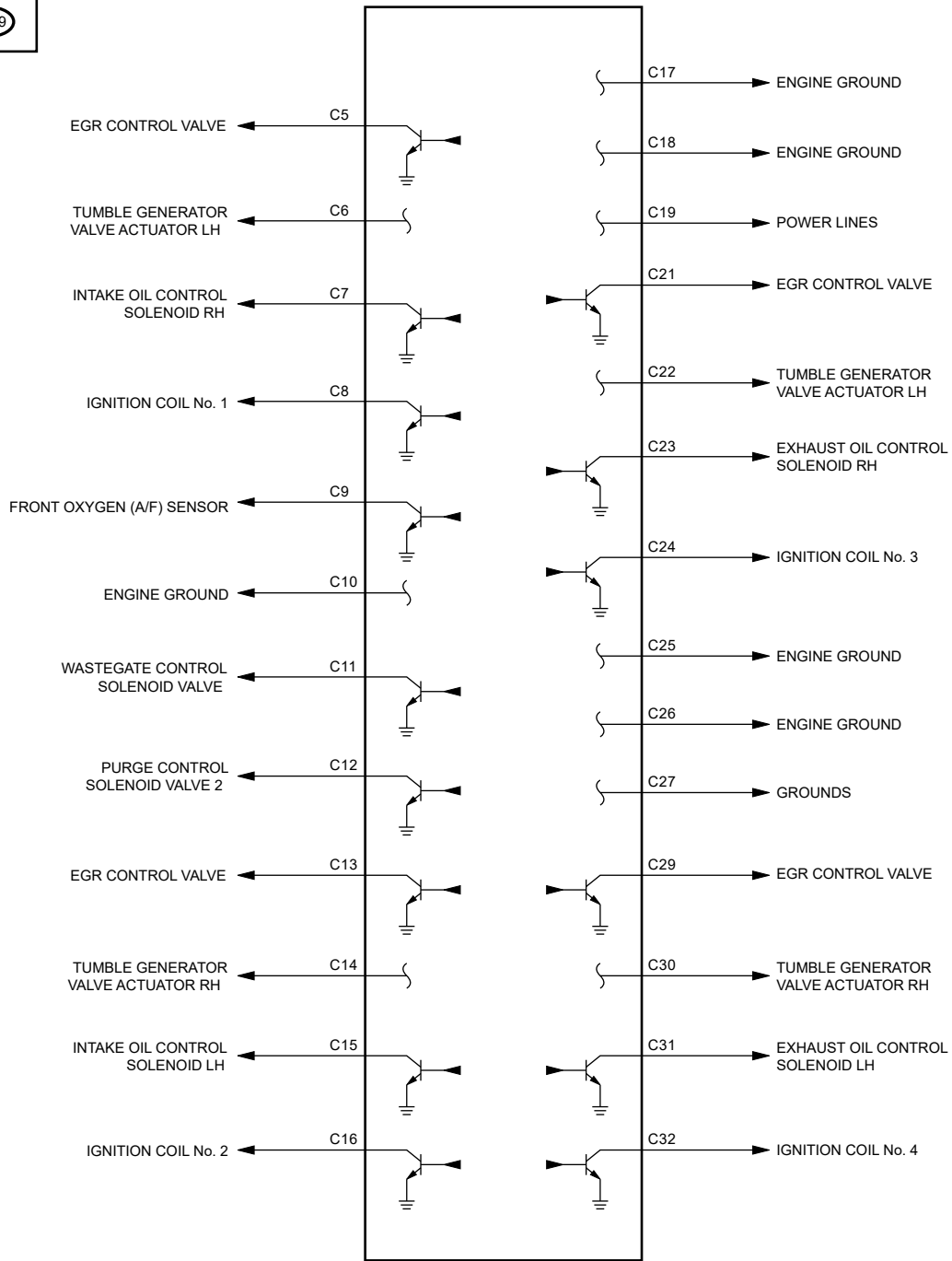


B: E158
C: E159

OP : WITHOUT PUSH BUTTON START
ND : WITHOUT ID CODE BOX
ID : WITH ID CODE BOX



C: E159




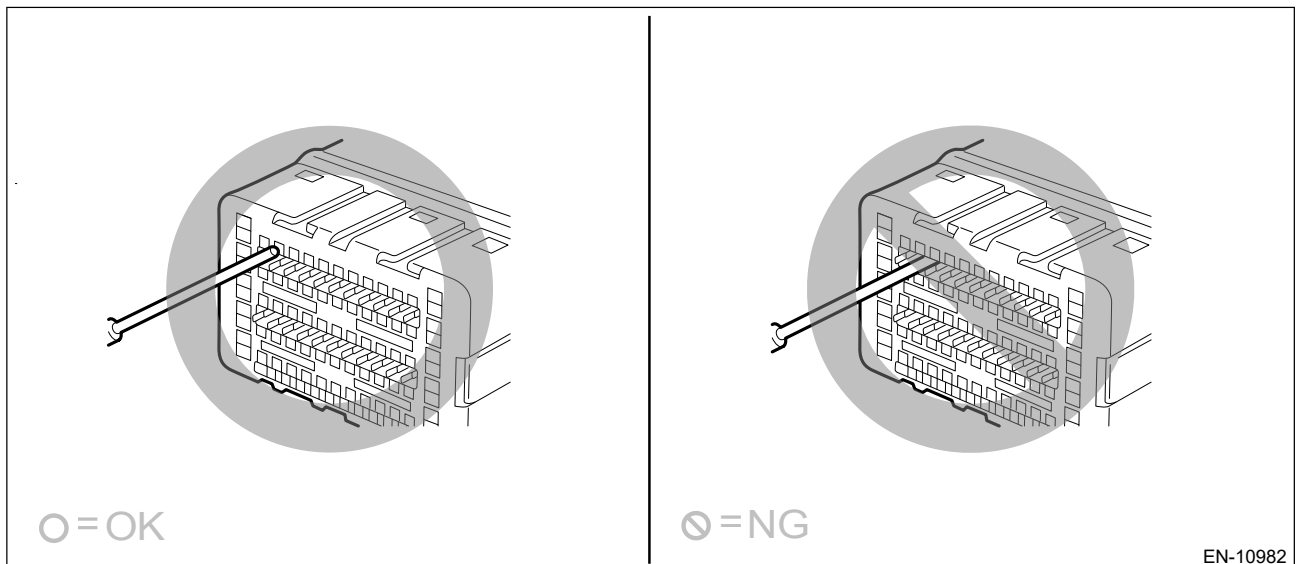
ENGINE (DIAGNOSTICS)(H4DOTC) > General Description

CAUTION

1. Airbag system wiring harness is routed near the ECM, main relay and fuel pump relay.

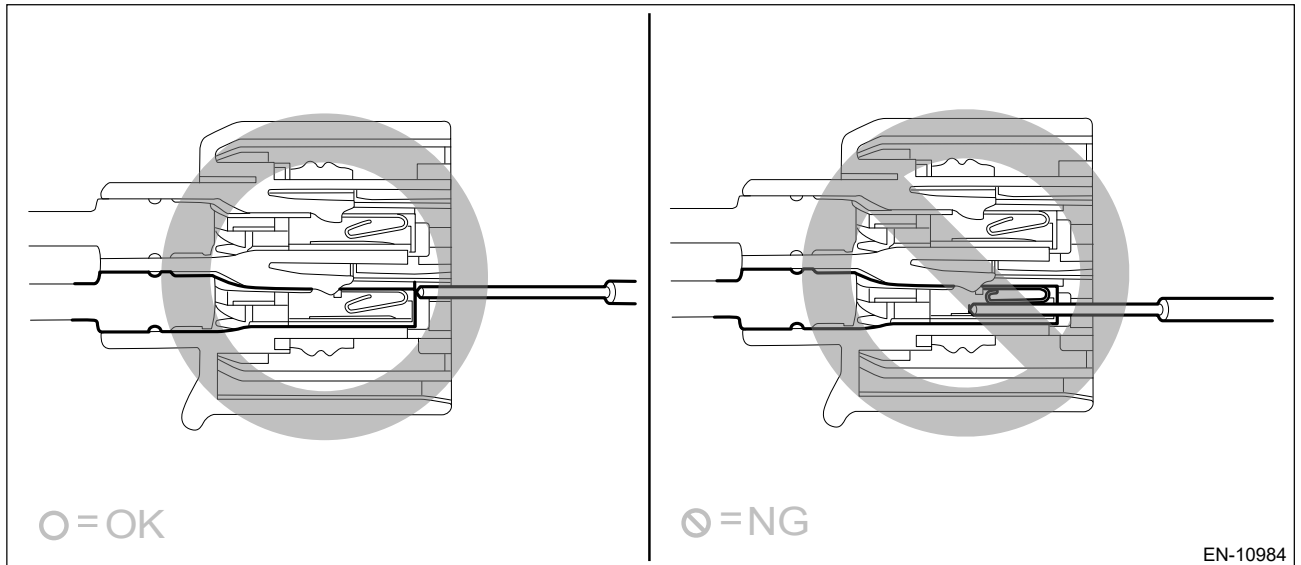
Caution:

- **Do not use electrical test equipment on the airbag system circuits.**
 - **Be careful not to damage the airbag system wiring harness when servicing the ECM, TCM, main relay and fuel pump relay.**
2. Never connect the battery in reverse polarity. Doing so will damage the ECM instantly, and other parts will also be damaged.
 3. Do not disconnect the battery cables while the engine is running. A large counter electromotive force will be generated in the generator, and this voltage may damage electronic parts such as ECM etc.
 4. When disconnecting the connectors of the electrical components, always be sure to turn the ignition switch to OFF. Perform the Clear Memory after connecting the connectors.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)
 5. When measuring the voltage or resistance of individual sensors or all electrical control modules, use a tapered pin with a diameter of 0.6 mm (0.024 in) or less and touch it to the tip of terminal.



EN-10982

Never insert the tapered pin into the terminal because it deforms inside which may lead to a malfunction.



Caution:

When replacing the ECM, be careful not to use the ECM of wrong specification to avoid any damage on the fuel injection system.

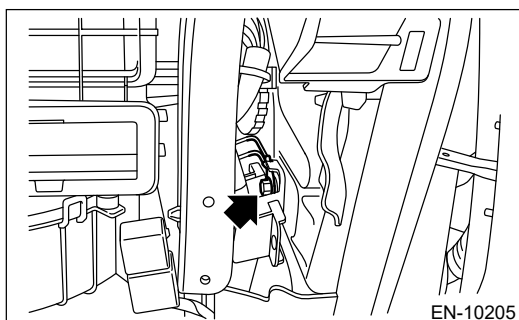
Note:

When replacing the ECM of the models with immobilizer, immobilizer system must be registered. For detailed procedures, refer to "REGISTRATION MANUAL FOR IMMOBILIZER".

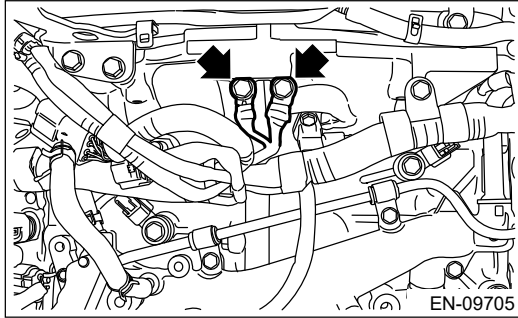
6. The ECM connector is waterproof. When measuring the ECM connector terminal voltages, or the resistance between the ECM connector terminals, use the ST.

ST 18460AA030 CHECK BOARD

7. Take care not to allow water to get into the connectors when servicing or washing the vehicle in rainy weather. Avoid exposure to water even if the connectors are waterproof.
8. Use the ground terminal of the bulkhead harness for the grounding point when measuring voltage and resistance inside the passenger compartment.






9. Use the engine ground terminal or engine assembly for the grounding point when measuring the voltage and resistance in engine compartment.



10. All parts related to the engine control system are precision parts. Do not drop or otherwise apply impact. Do not reuse the parts that are dropped accidentally.
11. Do not connect the wiring of electrical parts directly to the battery terminals. It may cause erroneous operation of the charge control, leading to early deterioration of the battery or discharged battery.
12. Observe the following cautions when installing a radio in vehicle.

Caution:


- **The antenna must be kept as far apart as possible from the ECM.**  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Electrical Component Location>LOCATION > CONTROL MODULE.](#)
 - **The antenna feeder must be placed as far apart as possible from the ECM and engine control system harness.**
 - **Carefully adjust the antenna for correct matching.**
 - **When mounting a large power type radio, pay special attention to the three items mentioned above.**
 - **Incorrect installation of the radio may affect the operation of ECM.**
13. When disconnecting the fuel hose, be sure to release the fuel pressure beforehand.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel>PROCEDURE > RELEASING OF FUEL PRESSURE.](#)
 14. Warning lights may illuminate when performing driving test with jacked-up or lifted-up condition, but this is not a system malfunction. The reason for this is the rotating speed difference between the front and rear wheels. When engine control system diagnosis is finished, perform the VDC memory clearance procedure of self-diagnosis function.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Clear memory.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > General Description

INSPECTION

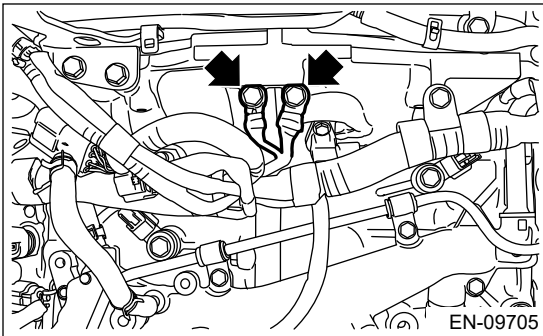
Before performing diagnostics, check the following item which might affect engine problems.

1. BATTERY

1. Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery Current & Temperature Sensor>INSPECTION.](#)
2. Check the condition of the main and other fuses, and harnesses and connectors. Also check for proper grounding.

2. ENGINE GROUND

Make sure that the engine ground terminal has no contamination, corrosion or looseness and is properly connected to the engine.



ENGINE (DIAGNOSTICS)(H4DOTC) > General Description


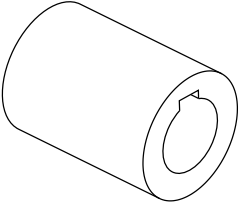
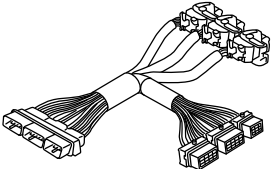
NOTE

- The on-board diagnostic (OBD) system detects and indicates a fault in various inputs and outputs of the complex electronic control. Malfunction indicator light in the combination meter indicates occurrence of a fault or trouble.
- Further, against any failure of sensors that would cause the vehicle to stop running, the fail-safe function is provided to ensure the minimal drivability.
- The OBD system incorporated with the vehicles within this type of engine complies with OBD-II regulations. The OBD system monitors the components and the system malfunction listed in "Engine Section" which affects on emissions.
- When the system decides that a malfunction occurs, malfunction indicator light illuminates. At the same time of the malfunction indicator light illumination or blinking, a DTC and a freeze frame engine conditions are stored into on-board computer.
- The OBD system stores freeze frame engine condition data (engine load, engine coolant temperature, fuel trim, engine speed and vehicle speed, etc.) into on-board computer when it detects a malfunction.
- Freeze frame engine condition data are stored until the DTCs are cleared. However when such malfunctions as fuel trim fault and misfire are detected with the freeze frame engine condition data stored, they are rewritten into those related to the fuel trim fault and misfire.
- When the malfunction does not occur again for three consecutive driving cycles*, malfunction indicator light is turned off, but DTC remains at on-board computer.
*: One driving cycle means the period between the ignition switch ON and the ignition switch OFF after driving.
- When performing diagnosis, connect the Subaru Select Monitor or general scan tool to the vehicle.

ENGINE (DIAGNOSTICS)(H4DOTC) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>STSSM4</p>	<p>— (Newly adopted tool)</p>	<p>SUBARU SELECT MONITOR 4</p>	<p>Used for setting of each function and troubleshooting for electrical system.</p> <p>Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".</p>
 <p>ST18252AA000</p>	<p>18252AA000</p>	<p>CRANKSHAFT SOCKET</p>	<p>Used for rotating crankshaft.</p>
 <p>ST18460AA030</p>	<p>18460AA030</p>	<p>CHECK BOARD</p>	<p>Used for measuring voltage and resistance of ECM terminals.</p>

2. GENERAL TOOL


TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Oscilloscope	Used for measuring the sensor.
DST-i	Used together with Subaru Select Monitor 4.

ENGINE (DIAGNOSTICS)(H4DOTC) > General Diagnostic Table

INSPECTION

1. ENGINE

Note:

Malfunction of parts other than those listed is also possible.  [Ref. to MECHANICAL\(H4DOTC\)>Symptoms and causes.](#)

Symptoms	Faulty parts
1. Engine stalls during idling.	<ol style="list-style-type: none"> 1) Electronic throttle control 2) Manifold absolute pressure sensor 3) Mass air flow and intake air temperature sensor 4) Ignition parts (*1) 5) Engine coolant temperature sensor (*2) 6) Crankshaft position sensor (*3) 7) Camshaft position sensor (*3) 8) Fuel injection parts (*4)
2. Rough idling	<ol style="list-style-type: none"> 1) Electronic throttle control 2) Manifold absolute pressure sensor 3) Mass air flow and intake air temperature sensor 4) Engine coolant temperature sensor (*2) 5) Ignition parts (*1) 6) Air intake system (*5) 7) Fuel injection parts (*4) 8) Crankshaft position sensor (*3) 9) Camshaft position sensor (*3) 10) Oxygen sensor 11) Fuel pump and fuel pump relay 12) EGR control valve
3. Engine does not return to idle.	<ol style="list-style-type: none"> 1) Electronic throttle control 2) Engine coolant temperature sensor 3) Manifold absolute pressure sensor 4) Mass air flow and intake air temperature sensor 5) Accelerator pedal position sensor 6) EGR control valve 7) Engine oil temperature sensor
4. Poor acceleration	<ol style="list-style-type: none"> 1) Manifold absolute pressure sensor 2) Mass air flow and intake air temperature sensor 3) Electronic throttle control 4) Fuel injection parts (*4) 5) Fuel pump and fuel pump relay 6) Engine coolant temperature sensor (*2) 7) Crankshaft position sensor (*3) 8) Camshaft position sensor (*3) 9) Accelerator pedal position sensor 10) Engine torque control signal circuit

	<ul style="list-style-type: none"> 11) Ignition parts (*1) 12) EGR control valve 13) Engine oil temperature sensor
5. Engine stalls, hesitates, or sputters at acceleration.	<ul style="list-style-type: none"> 1) Manifold absolute pressure sensor 2) Mass air flow and intake air temperature sensor 3) Engine coolant temperature sensor (*2) 4) Crankshaft position sensor (*3) 5) Camshaft position sensor (*3) 6) Purge control solenoid valve 7) Fuel injection parts (*4) 8) Fuel pump and fuel pump relay 9) Electronic throttle control 10) EGR control valve
6. Surging	<ul style="list-style-type: none"> 1) Manifold absolute pressure sensor 2) Mass air flow and intake air temperature sensor 3) Engine coolant temperature sensor (*2) 4) Crankshaft position sensor (*3) 5) Camshaft position sensor (*3) 6) Fuel injection parts (*4) 7) Electronic throttle control 8) Fuel pump and fuel pump relay 9) EGR control valve
7. Spark knock	<ul style="list-style-type: none"> 1) Manifold absolute pressure sensor 2) Mass air flow and intake air temperature sensor 3) Engine coolant temperature sensor 4) Knock sensor 5) Fuel injection parts (*4) 6) Fuel pump and fuel pump relay 7) EGR control valve
8. After burning in exhaust system	<ul style="list-style-type: none"> 1) Manifold absolute pressure sensor 2) Mass air flow and intake air temperature sensor 3) Engine coolant temperature sensor (*2) 4) Fuel injection parts (*4) 5) Fuel pump and fuel pump relay

*1: Check ignition coil and spark plug.

*2: Indicate the symptom occurring only in cold temperatures.

*3: Ensure secure installation.

*4: Check fuel injector, fuel pressure regulator and fuel filter.

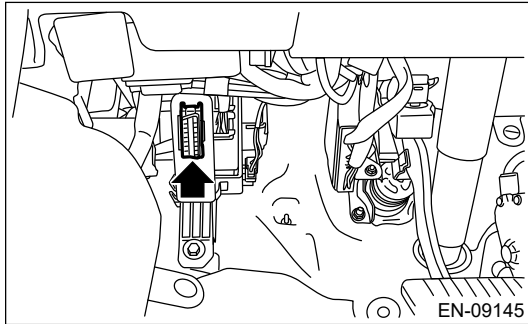
*5: Inspect for air leak in air intake system.

ENGINE (DIAGNOSTICS)(H4DOTC) > General Scan Tool

OPERATION

1. HOW TO USE GENERAL SCAN TOOL

1. Prepare a scan tool (general scan tool) required by SAE J1978.
2. Connect the general scan tool to data link connector located in the lower portion of the instrument panel (on the driver's side).



3. Using the general scan tool, call up each data. General scan tool functions consist of:
 - (1) MODE \$01: Current powertrain diagnostic data
 - (2) MODE \$02: Powertrain freeze frame data
 - (3) MODE \$03: Emission-related powertrain DTC
 - (4) MODE \$04: Clear/Reset emission-related diagnostic information
 - (5) MODE \$06: Request on-board monitoring test results for intermittently monitored systems
 - (6) MODE \$07: Initial emission-related powertrain DTC
 - (7) MODE \$08: Request control for on-board system, test, and component
 - (8) MODE \$09: Request vehicle information
4. Read out the data according to repair procedures. (For detailed operation procedure, refer to the general scan tool operation manual.)

Note:

For details concerning DTC, refer to "List of Diagnostic Trouble Code (DTC)". 
[Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

2. MODE \$01 (CURRENT POWERTRAIN DIAGNOSTIC DATA)

Refer to data denoting the current operating condition of analog input/output, digital input/output or the powertrain system.

A list of the support data and PID (Parameter Identification) codes are shown in the following table.

PID	Data	Unit of measure
\$01	Number of emission-related powertrain DTC, and malfunction indicator light status and diagnosis support information	—
\$03	Fuel system control status	—
\$04	Calculated engine load value	%
\$05	Engine coolant temperature	Celsius
\$06	Short term fuel trim	%
\$07	Long term fuel trim	%

\$0B	Intake manifold absolute pressure	kPa
\$0C	Engine speed	rpm
\$0D	Vehicle speed	MPH
\$0E	Ignition timing advance	°
\$10	Intake air amount	g/s
\$11	Throttle valve absolute opening angle	%
\$13	Check whether oxygen sensor is installed.	—
\$15	Oxygen sensor output voltage and short term fuel trim associated with oxygen sensor	V and %
\$1C	Supporting OBD system	—
\$1F	Elapsed time after starting the engine	sec
\$21	Running distance after MIL turns on	miles
\$24	A/F value and A/F sensor output voltage	— and V
\$2C	Target EGR	%
\$2D	EGR error	%
\$2E	Evaporative purge	%
\$2F	Fuel level	%
\$30	Number of warm ups after DTC clear	—
\$31	Travel distance after DTC clear	miles
\$33	Barometric pressure	kPa
\$34	A/F value and A/F sensor output current	— and mA
\$3C	Catalyst temperature	Celsius
\$41	Diagnostic monitor of each drive cycle	—
\$42	ECM power voltage	V
\$43	Absolute load	%
\$44	A/F target lambda	—
\$45	Relative throttle opening angle	%
\$46	Ambient temperature	Celsius
\$47	Absolute throttle opening angle 2	%
\$49	Absolute accelerator opening angle 1	%
\$4A	Absolute accelerator opening angle 2	%
\$4C	Target throttle opening angle	%
\$4D	Engine operation time during MIL on	min
\$4E	Elapsed time after DTC clear	min
\$51	Fuel used	—
\$53	ELCM pressure	kPa
\$5A	Relative accelerator opening angle	%
\$5C	Engine oil temperature	Celsius
\$65	Neutral status	—
\$68	Intake air temperature	Celsius
\$6D	Fuel pressure and target fuel pressure	kPa

Note:

Refer to general scan tool manufacturer's operation manual to access current powertrain diagnostic data (MODE \$01).

3. MODE \$02 (POWERTRAIN FREEZE FRAME DATA)

Refer to data denoting the operating condition when trouble is detected by on-board diagnosis system.

A list of the support data and PID (Parameter Identification) codes are shown in the following table.


PID	Data	Unit of measure
\$02	DTC that caused freeze frame data to be stored	—
\$03	Fuel system control status	—
\$04	Calculated engine load value	%
\$05	Engine coolant temperature	Celsius
\$06	Short term fuel trim	%
\$07	Long term fuel trim	%
\$0B	Intake manifold absolute pressure	kPa
\$0C	Engine speed	rpm
\$0D	Vehicle speed	MPH
\$0E	Ignition timing advance	°
\$10	Intake air amount	g/s
\$11	Throttle valve absolute opening angle	%
\$13	Air fuel ratio sensor	—
\$15	Rear oxygen sensor voltage, compensation value	V and %
\$1C	Supporting OBD system	—
\$1F	Elapsed time after starting the engine	sec
\$2C	Target EGR	%
\$2D	EGR error	%
\$2E	Evaporative purge	%
\$2F	Fuel level	%
\$33	Barometric pressure	kPa
\$42	ECM power voltage	V
\$43	Absolute load	%
\$44	A/F target lambda	—
\$45	Relative throttle opening angle	%
\$46	Ambient temperature	Celsius
\$47	Absolute throttle opening angle 2	%
\$49	Absolute accelerator opening angle 1	%
\$4A	Absolute accelerator opening angle 2	%
\$4C	Target throttle opening angle	%
\$65	Neutral status	—
\$68	Intake air temperature	Celsius

\$6D	Fuel pressure and target fuel pressure	kPa
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Note:

Refer to general scan tool manufacturer’s operation manual to access freeze frame data (MODE \$02).

4. MODE \$03 (EMISSION-RELATED POWERTRAIN DTC)

Refer to “List of Diagnostic Trouble Code (DTC)” for information about data denoting emission-related powertrain DTC.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

5. MODE \$04 (CLEAR/RESET EMISSION-RELATED DIAGNOSTIC INFORMATION)

Refer to the mode used to clear or reset emission-related diagnostic information.

Note:

- Refer to the manufacturer’s operation manual for the general scan tool to clear the emission-related diagnostic information (MODE \$04).
- Initial diagnosis of electronic throttle control is performed after memory clearance. Wait for 10 seconds or more after turning the ignition switch to ON, and then start the engine.

6. MODE \$06 (REQUEST ON-BOARD MONITORING TEST RESULTS FOR INTERMITTENTLY MONITORED SYSTEMS)

Refer to diagnostic value of troubleshooting and data of test limit indicated on the support data bit sequence table. A list of the support data is shown in the table 1.

Note:

- **Subaru Select Monitor**
For detailed operation procedures, refer to “Application help”.
- **General scan tool**
For detailed operation procedures, refer to the general scan tool operation manual.
- Some items are not displayed according to the specifications.
- List of measurement items for each DTC of “VVT monitor bank 1” and “VVT monitor bank 2”
A list of the measurement items is shown in the table 2. (This is used for a check of on-board monitor test result of DTC P000A, P000B, P000C, P000D, P0011, P0014, P0016, P0017, P0018, P0019, P0021 and P0024.)

Table 1

OBDMI D	TID	SID	Diagnostic item
\$01	\$84	\$1E	A/F sensor range failure (Bank 1 Sensor 1)
	\$85	\$1E	
	\$86	\$20	A/F sensor response failure (Bank 1 Sensor 1)
	\$91	\$20	
	\$92	\$10	
	\$A3	\$20	
	\$A4	\$10	

	\$AC	\$10	
	\$AD	\$10	
	\$AE	\$10	
	\$AF	\$10	
	\$CD	\$20	
	\$CF	\$20	
	\$DF	\$10	
\$02	\$07	\$0B	Oxygen sensor drop failure (Bank 1 Sensor 2)
	\$08	\$0B	
	\$A5	\$0B	
	\$05	\$10	Oxygen sensor response failure (Bank 1 Sensor 2)
	\$06	\$10	
	\$BD	\$10	
	\$D1	\$10	Oxygen sensor delay failure (Bank 1 Sensor 2)
	\$D2	\$01	
\$21	\$89	\$20	Catalyst deterioration diagnosis (Bank 1)
\$31	\$8A	\$17	EGR system diagnosis
\$35	\$8B	\$9D	VVT monitor bank 1
	\$8C	\$9D	
	\$8D	\$9D	
	\$8E	\$9D	
	\$D3	\$9D	
	\$D4	\$9D	
	\$D5	\$9D	
	\$D6	\$9D	
\$36	\$8B	\$9D	VVT monitor bank 2
	\$8C	\$9D	
	\$8D	\$9D	
	\$8E	\$9D	
	\$D3	\$9D	
	\$D4	\$9D	
	\$D5	\$9D	
	\$D6	\$9D	
\$3C	\$C1	\$FE	Evaporative emission control system (0.02 inch leak)
	\$C2	\$FE	
	\$C3	\$FE	
	\$C4	\$FE	
	\$C5	\$FE	
	\$C6	\$35	
	\$C7	\$FE	
	\$C8	\$FE	

	\$C9	\$FE	Evaporative emission control system
	\$CA	\$FE	
	\$E4	\$FE	
\$3D	\$E2	\$FE	Purge flow
	\$E3	\$FE	
\$41	\$9B	\$14	A/F sensor heater characteristics failure (Bank 1 Sensor 1)
\$42	\$E1	\$0E	Oxygen sensor heater characteristics failure (Bank 1 Sensor 2)
\$A1	\$0B	\$24	Misfire monitoring (all cylinders)
	\$0C	\$24	
\$A2	\$0B	\$24	Misfire monitoring (#1 cylinder)
	\$0C	\$24	
\$A3	\$0B	\$24	Misfire monitoring (#2 cylinder)
	\$0C	\$24	
\$A4	\$0B	\$24	Misfire monitoring (#3 cylinder)
	\$0C	\$24	
\$A5	\$0B	\$24	Misfire monitoring (#4 cylinder)
	\$0C	\$24	

Table 2

OBDMI D	TID	SID	Diagnostic item		
\$35	\$8B	\$9D	+	Intake	VVT monitor bank 1 (RH)
	\$8C	\$9D	-		
	\$8D	\$9D	+	Exhaust	
	\$8E	\$9D	-		
\$36	\$8B	\$9D	+	Intake	VVT monitor bank 2 (LH)
	\$8C	\$9D	-		
	\$8D	\$9D	+	Exhaust	
	\$8E	\$9D	-		

7. MODE \$07 (INITIAL EMISSION-RELATED POWERTRAIN DTC)

Refer to the data of DTC (temporary code) for troubleshooting result about emission in the first time.

8. MODE \$08 (REQUEST CONTROL FOR ON-BOARD SYSTEM, TEST, AND COMPONENT)

Perform "Active Test" of the on-board system.


9. MODE \$09 (REQUEST VEHICLE INFORMATION)

Refer to the data of the vehicle specification.

ENGINE (DIAGNOSTICS)(H4DOTC) > Inspection Mode

PROCEDURE

Perform the diagnosis shown in the following DTC table.

When performing the diagnosis not listed in "List of Diagnostic Trouble Code (DTC)", refer to the item on the drive cycle.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Drive Cycle.](#)



DTC	Item	Condition
B1570	ANTENNA	—
B1571	REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM)	—
B1572	IMM CIRCUIT EXCEPT ANTENNA CIRCUIT	—
B1574	KEY COMMUNICATION FAILURE	—
B1575	INCORRECT IMMOBILIZER KEY	—
B1576	EGI CONTROL MODULE EEPROM	—
B1577	IMM CONTROL MODULE EEPROM	—
B1578	METER	—
P0010	"A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1	—
P0013	"B" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1	—
P0020	"A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2	—
P0023	"B" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2	—
P0031	A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 1	—
P0032	A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 1	—
P0037	A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 2	—
P0038	A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 2	—
P0072	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" LOW	—
P0073	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" HIGH	—
P0097	INTAKE AIR TEMPERATURE SENSOR 2 CIRCUIT LOW BANK 1	—
P0098	INTAKE AIR TEMPERATURE SENSOR 2 CIRCUIT HIGH BANK 1	—
P0102	MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT LOW	—
P0103	MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT HIGH	—
P0107	MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT LOW	—

P0108	MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT HIGH	—
P0112	INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW BANK 1	—
P0113	INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH BANK 1	—
P0117	ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT LOW	—
P0118	ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT HIGH	—
P0122	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW	—
P0123	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH	—
P0131	A/F / O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 1	—
P0132	A/F / O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 1	—
P0192	FUEL RAIL PRESSURE SENSOR CIRCUIT LOW BANK 1	—
P0193	FUEL RAIL PRESSURE SENSOR CIRCUIT HIGH BANK 1	—
P0197	ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT LOW	—
P0198	ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT HIGH	—
P0222	THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW	—
P0223	THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT HIGH	—
P0230	FUEL PUMP PRIMARY CIRCUIT	—
P023F	FUEL PUMP SECONDARY CIRCUIT/OPEN	—
P0245	TURBOCHARGER/SUPERCHARGER WASTEGATE SOLENOID "A" LOW	—
P0327	KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT LOW BANK 1 OR SINGLE SENSOR	—
P0328	KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT HIGH BANK 1 OR SINGLE SENSOR	—
P0332	KNOCK/COMBUSTION VIBRATION SENSOR 2 CIRCUIT LOW BANK 2	—
P0333	KNOCK/COMBUSTION VIBRATION SENSOR 2 CIRCUIT HIGH BANK 2	—
P0335	CRANKSHAFT POSITION SENSOR "A" CIRCUIT	—
P0336	CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE	—
P0340	CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 1 OR	—


	SINGLE SENSOR	
P0341	CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 1 OR SINGLE SENSOR	—
P0345	CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 2	—
P0346	CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 2	—
P0351	IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN	—
P0352	IGNITION COIL "B" PRIMARY CONTROL CIRCUIT/OPEN	—
P0353	IGNITION COIL "C" PRIMARY CONTROL CIRCUIT/OPEN	—
P0354	IGNITION COIL "D" PRIMARY CONTROL CIRCUIT/OPEN	—
P0365	CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 1	—
P0366	CAMSHAFT POSITION SENSOR "B" CIRCUIT RANGE/PERFORMANCE BANK 1	—
P0390	CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 2	—
P0391	CAMSHAFT POSITION SENSOR "B" CIRCUIT RANGE/PERFORMANCE BANK 2	—
P0452	EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT LOW	—
P0453	EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT HIGH	—
P0458	EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT LOW	—
P0462	FUEL LEVEL SENSOR "A" CIRCUIT LOW	—
P0463	FUEL LEVEL SENSOR "A" CIRCUIT HIGH	—
P04AC	EVAP SYSTEM (CPC) PURGE CONTROL VALVE "B" CIRCUIT LOW	—
P04DB	CRANKCASE VENTILATION SYSTEM (PCV) DISCONNECTED	—
P0512	STARTER (SWITCH) REQUEST CIRCUIT	—
P0560	SYSTEM VOLTAGE	—
P0604	INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR	—
P0605	INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR	—
P0606	CONTROL MODULE PROCESSOR	—
P060A	INTERNAL CONTROL MODULE MONITORING PROCESSOR PERFORMANCE	—
P060B	INTERNAL CONTROL MODULE A/D PROCESSING PERFORMANCE	—
P0616	STARTER RELAY "A" CIRCUIT LOW	—
P0617	STARTER RELAY "A" CIRCUIT HIGH	—
P062F	INTERNAL CONTROL MODULE EEPROM ERROR	—
P0685	ECM/PCM POWER RELAY CONTROL CIRCUIT/OPEN	—

P081A	STARTER DISABLE CIRCUIT LOW	—
P1134	A/F / O2 SENSOR BANK1 SENSOR1 SERIAL PERIPHERAL INTERFACE (SPI) COMMUNICATION	—
P1160	THROTTLE RETURN SPRING	—
P2009	TGV CONTROL CIRCUIT LOW BANK 1	—
P2012	TGV CONTROL CIRCUIT LOW BANK 2	—
P2016	TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 1	—
P2017	TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 1	—
P2021	TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 2	—
P2022	TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 2	—
P2101	THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE	—
P2102	THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT LOW	—
P2103	THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT HIGH	—
P2109	THROTTLE/PEDAL POSITION SENSOR "A" MINIMUM STOP PERFORMANCE	—
P2119	THROTTLE ACTUATOR "A" CONTROL THROTTLE BODY RANGE/PERFORMANCE	—
P2122	THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT LOW	—
P2123	THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH	—
P2127	THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW	—
P2128	THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH	—
P2135	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE CORRELATION	—
P2138	THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE CORRELATION	—
P2146	FUEL INJECTOR GROUP "A" SUPPLY VOLTAGE CIRCUIT/OPEN	—
P2228	BAROMETRIC PRESSURE SENSOR "A" CIRCUIT LOW	—
P2229	BAROMETRIC PRESSURE SENSOR "A" CIRCUIT HIGH	—
P2401	EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT LOW	—
P2419	EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT LOW	—
P2530	IGNITION SWITCH RUN POSITION CIRCUIT	—
U0073	CONTROL MODULE COMMUNICATION BUS "A" OFF	—
U0101	LOST COMMUNICATION WITH TCM	—
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS	—

	CONTROL MODULE	
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	—
U0402	INVALID DATA RECEIVED FROM TCM	—
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	—
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	—

1. Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 L (5.3 — 10.6 US gal, 4.4 — 8.8 Imp gal)].
2. Clear the memory.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)
3. Read the diagnostic trouble code (DTC) and check that no DTC is displayed.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)


Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis using “Diagnostic Procedure with Diagnostic Trouble Code (DTC)”.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\).](#) **After solving the DTC, repeat from step 2).**


4. Start the engine, and run the engine at idle for 10 seconds or more.
5. Read the readiness code using Subaru Select Monitor and check that the concerned DTC is not displayed. For detailed operation procedures, refer to “PC application help for Subaru Select Monitor”.

Note:

- **The readiness code shows self-diagnosis status of each DTC. If any DTC is displayed when you select the readiness code, the self-diagnosis of the DTC is not executed or completed. After the self-diagnosis is complete, DTC will no longer be displayed regardless of the diagnostic result.**
- **Self-diagnosis is executed every time when the ignition switch is turned to ON. Therefore, even after the self-diagnosis is complete and nothing is displayed on the readiness code display, if you turn the ignition switch to ON again after turning it OFF, some DTCs may be displayed on the readiness code display.**
- **After you repair a DTC and perform the Inspection Mode or the drive cycle, use the readiness code to check if the self-diagnosis of the DTC is completed. If the concerned DTC is displayed, the self-diagnosis of the DTC is not complete. Repeat from step 4).**













6. Read the diagnostic trouble code (DTC) and check the DTC.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)

Note:













If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis using “Diagnostic Procedure with Diagnostic Trouble Code (DTC)”.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\).](#) **After solving the DTC, repeat from step 2).**













ENGINE (DIAGNOSTICS)(H4DOTC) > List of Diagnostic Trouble Code (DTC)













LIST












DTC	Item	Note
B1570	ANTENNA	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1570 ANTENNA.
B1571	REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM)	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1571 REFERENCE CODE INCOMPATIBILITY.  Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1571 REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM).
B1572	IMM CIRCUIT EXCEPT ANTENNA CIRCUIT	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1572 IMM CIRCUIT EXCEPT ANTENNA CIRCUIT.  Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1572 IMM CIRCUIT EXCEPT ANTENNA CIRCUIT.
B1574	KEY COMMUNICATION	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1574 KEY COMMUNICATION.
B1575	INCORRECT IMMOBILIZER KEY	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1575 INCORRECT IMMOBILIZER KEY.
B1576	ECM EEPROM	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1576 EGI CONTROL MODULE EEPROM.  Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1576 EGI CONTROL MODULE EEPROM.
B1577	IMMOBILIZER CM EEPROM	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1577 IMM CONTROL MODULE EEPROM.  Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1577 IMM CONTROL MODULE EEPROM.
B1578	METER	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1578 METER.


P000A	"A" CAMSHAFT POSITION SLOW RESPONSE BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P000A "A" CAMSHAFT POSITION SLOW RESPONSE BANK 1.
P000B	"B" CAMSHAFT POSITION SLOW RESPONSE BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P000B "B" CAMSHAFT POSITION SLOW RESPONSE BANK 1.
P000C	"A" CAMSHAFT POSITION SLOW RESPONSE BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P000C "A" CAMSHAFT POSITION SLOW RESPONSE BANK 2.
P000D	"B" CAMSHAFT POSITION SLOW RESPONSE BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P000D "B" CAMSHAFT POSITION SLOW RESPONSE BANK 2.
P0010	"A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0010 "A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1.
P0011	"A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0011 "A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1.
P0013	"B" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0013 "B" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1.
P0014	"B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0014 "B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1.
P0016	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR A	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0016 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR A.
P0017	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR B	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0017 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR B.
P0018	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR A	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0018 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR A.
P0019	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR B	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0019 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR B.














P0020	"A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0020 "A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2.
P0021	"A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0021 "A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2.
P0023	"B" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0023 "B" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2.
P0024	"B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0024 "B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2.
P0030	A/F / O2 HEATER CONTROL CIRCUIT BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0030 A/F / O2 HEATER CONTROL CIRCUIT BANK 1 SENSOR 1.
P0031	A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0031 A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 1.
P0032	A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0032 A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 1.
P0037	A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0037 A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 2.
P0038	A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0038 A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 2.
P0068	MAP/MAF - THROTTLE POSITION CORRELATION	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0068 MAP/MAF - THROTTLE POSITION CORRELATION.
P0071	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" RANGE/PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0071 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" RANGE/PERFORMANCE.
P0072	AMBIENT AIR TEMPERATURE SENSOR	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0072











	CIRCUIT "A" LOW	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" LOW.
P0073	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0073 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" HIGH.
P0087	FUEL RAIL/SYSTEM PRESSURE - TOO LOW BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0087 FUEL RAIL/SYSTEM PRESSURE - TOO LOW BANK 1.
P0088	FUEL RAIL/SYSTEM PRESSURE - TOO HIGH BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0088 FUEL RAIL/SYSTEM PRESSURE - TOO HIGH BANK 1.
P0096	INTAKE AIR TEMPERATURE SENSOR 2 CIRCUIT RANGE/PERFORMANCE BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0096 INTAKE AIR TEMPERATURE SENSOR 2 CIRCUIT RANGE/PERFORMANCE BANK 1.
P0097	INTAKE AIR TEMPERATURE SENSOR 2 CIRCUIT LOW BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0097 INTAKE AIR TEMPERATURE SENSOR 2 CIRCUIT LOW BANK 1.
P0098	INTAKE AIR TEMPERATURE SENSOR 2 CIRCUIT HIGH BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0098 INTAKE AIR TEMPERATURE SENSOR 2 CIRCUIT HIGH BANK 1.
P0101	MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT RANGE/PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0101 MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT RANGE/PERFORMANCE.
P0102	MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0102 MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT LOW.
P0103	MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0103 MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT HIGH.
P0107	MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0107 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT LOW.
P0108	MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0108 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT HIGH.
P0111	INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0111 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE BANK 1.














P0112	INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0112 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW BANK 1.
P0113	INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0113 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH BANK 1.
P0116	ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0116 ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE.
P0117	ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0117 ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT LOW.
P0118	ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0118 ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT HIGH.
P0122	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW.
P0123	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH.
P0125	INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0125 INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL.
P0128	COOLANT THERMOSTAT (ENGINE COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE)	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0128 COOLANT THERMOSTAT (ENGINE COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE).
P0130	A/F / O2 SENSOR CIRCUIT BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0130 A/F / O2 SENSOR CIRCUIT BANK 1 SENSOR 1.
P0131	A/F / O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0131 A/F / O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 1.
P0132	A/F / O2 SENSOR CIRCUIT	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic














	HIGH VOLTAGE BANK 1 SENSOR 1	Procedure with Diagnostic Trouble Code (DTC)>DTC P0132 A/F / O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 1.
P0134	A/F / O2 SENSOR CIRCUIT NO ACTIVITY DETECTED BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0134 A/F / O2 SENSOR CIRCUIT NO ACTIVITY DETECTED BANK 1 SENSOR 1.
P0137	O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0137 O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 2.
P0138	O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0138 O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 2.
P013A	O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P013A O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2.
P013B	O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P013B O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 2.
P013E	O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P013E O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 2.
P013F	O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P013F O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 2.
P0141	O2 SENSOR HEATER CIRCUIT BANK 1 SENSOR 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0141 O2 SENSOR HEATER CIRCUIT BANK 1 SENSOR 2.
P014C	A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P014C A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1.
P014D	A/F / O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P014D A/F / O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 1.
P015A	A/F / O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P015A A/F / O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 1.










P015B	A/F / O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P015B A/F / O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 1.
P0171	SYSTEM TOO LEAN BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0171 SYSTEM TOO LEAN BANK 1.
P0172	SYSTEM TOO RICH BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0172 SYSTEM TOO RICH BANK 1.
P0191	FUEL RAIL PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0191 FUEL RAIL PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE BANK 1.
P0192	FUEL RAIL PRESSURE SENSOR CIRCUIT LOW BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0192 FUEL RAIL PRESSURE SENSOR CIRCUIT LOW BANK 1.
P0193	FUEL RAIL PRESSURE SENSOR CIRCUIT HIGH BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0193 FUEL RAIL PRESSURE SENSOR CIRCUIT HIGH BANK 1.
P0196	ENGINE OIL TEMPERATURE SENSOR "A" RANGE/PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0196 ENGINE OIL TEMPERATURE SENSOR "A" RANGE/PERFORMANCE.
P0197	ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0197 ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT LOW.
P0198	ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0198 ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT HIGH.
P0222	THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0222 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW.
P0223	THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0223 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT HIGH.
P0230	FUEL PUMP PRIMARY CIRCUIT	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0230 FUEL PUMP PRIMARY CIRCUIT.
P023F	FUEL PUMP SECONDARY CIRCUIT/OPEN	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P023F FUEL PUMP SECONDARY CIRCUIT/OPEN.















P0244	TURBOCHARGER/SUPERCHARGER WASTEGATE SOLENOID "A" RANGE/PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0244 TURBOCHARGER/SUPERCHARGER WASTEGATE SOLENOID "A" RANGE/PERFORMANCE.
P0245	TURBOCHARGER/SUPERCHARGER WASTEGATE SOLENOID "A" LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0245 TURBOCHARGER/SUPERCHARGER WASTEGATE SOLENOID "A" LOW.
P0246	TURBOCHARGER/SUPERCHARGER WASTEGATE SOLENOID "A" HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0246 TURBOCHARGER/SUPERCHARGER WASTEGATE SOLENOID "A" HIGH.
P0300	RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0300 RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED.
P0301	CYLINDER 1 MISFIRE DETECTED	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0301 CYLINDER 1 MISFIRE DETECTED.
P0302	CYLINDER 2 MISFIRE DETECTED	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0302 CYLINDER 2 MISFIRE DETECTED.
P0303	CYLINDER 3 MISFIRE DETECTED	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0303 CYLINDER 3 MISFIRE DETECTED.
P0304	CYLINDER 4 MISFIRE DETECTED	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0304 CYLINDER 4 MISFIRE DETECTED.
P0327	KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT LOW BANK 1 OR SINGLE SENSOR	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0327 KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT LOW BANK 1 OR SINGLE SENSOR.
P0328	KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT HIGH BANK 1 OR SINGLE SENSOR	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0328 KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT HIGH BANK 1 OR SINGLE SENSOR.
P0332	KNOCK/COMBUSTION VIBRATION SENSOR 2 CIRCUIT LOW BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0332 KNOCK/COMBUSTION VIBRATION SENSOR 2 CIRCUIT LOW BANK 2.
P0333	KNOCK/COMBUSTION VIBRATION SENSOR 2 CIRCUIT HIGH BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0333 KNOCK/COMBUSTION VIBRATION SENSOR 2 CIRCUIT HIGH BANK 2.
P0335	CRANKSHAFT POSITION	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic










	SENSOR "A" CIRCUIT	Procedure with Diagnostic Trouble Code (DTC)>DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT.
P0336	CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0336 CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE.
P0340	CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 1 OR SINGLE SENSOR	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 1 OR SINGLE SENSOR.
P0341	CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 1 OR SINGLE SENSOR	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0341 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 1 OR SINGLE SENSOR.
P0345	CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0345 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 2.
P0346	CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0346 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 2.
P0351	IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN.
P0352	IGNITION COIL "B" PRIMARY CONTROL CIRCUIT/OPEN	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0352 IGNITION COIL "B" PRIMARY CONTROL CIRCUIT/OPEN.
P0353	IGNITION COIL "C" PRIMARY CONTROL CIRCUIT/OPEN	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0353 IGNITION COIL "C" PRIMARY CONTROL CIRCUIT/OPEN.
P0354	IGNITION COIL "D" PRIMARY CONTROL CIRCUIT/OPEN	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0354 IGNITION COIL "D" PRIMARY CONTROL CIRCUIT/OPEN.
P0365	CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0365 CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 1.
P0366	CAMSHAFT POSITION SENSOR "B" CIRCUIT RANGE/PERFORMANCE BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0366 CAMSHAFT POSITION SENSOR "B" CIRCUIT RANGE/PERFORMANCE BANK 1.
P0390	CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0390 CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 2.















P0391	CAMSHAFT POSITION SENSOR "B" CIRCUIT RANGE/PERFORMANCE BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0391 CAMSHAFT POSITION SENSOR "B" CIRCUIT RANGE/PERFORMANCE BANK 2.
P0400	EGR "A" FLOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0400 EGR "A" FLOW.
P0420	CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0420 CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD BANK 1.
P0441	EVAP SYSTEM (CPC) INCORRECT PURGE FLOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0441 EVAP SYSTEM (CPC) INCORRECT PURGE FLOW.
P0451	EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT RANGE/PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0451 EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT RANGE/PERFORMANCE.
P0452	EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0452 EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT LOW.
P0453	EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0453 EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT HIGH.
P0455	EVAP SYSTEM (CPC) LEAK DETECTED (LARGE LEAK)	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0455 EVAP SYSTEM (CPC) LEAK DETECTED (LARGE LEAK).
P0456	EVAP SYSTEM (CPC) LEAK DETECTED (VERY SMALL LEAK)	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0456 EVAP SYSTEM (CPC) LEAK DETECTED (VERY SMALL LEAK).
P0458	EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0458 EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT LOW.
P0459	EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0459 EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT HIGH.
P0461	FUEL LEVEL SENSOR "A" CIRCUIT RANGE/PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0461 FUEL LEVEL SENSOR "A" CIRCUIT RANGE/PERFORMANCE.
P0462	FUEL LEVEL SENSOR "A"	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic










	CIRCUIT LOW	Procedure with Diagnostic Trouble Code (DTC)>DTC P0462 FUEL LEVEL SENSOR "A" CIRCUIT LOW.
P0463	FUEL LEVEL SENSOR "A" CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0463 FUEL LEVEL SENSOR "A" CIRCUIT HIGH.
P04AC	EVAP SYSTEM (CPC) PURGE CONTROL VALVE "B" CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P04AC EVAP SYSTEM (CPC) PURGE CONTROL VALVE "B" CIRCUIT LOW.
P04AD	EVAP SYSTEM (CPC) PURGE CONTROL VALVE "B" CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P04AD EVAP SYSTEM (CPC) PURGE CONTROL VALVE "B" CIRCUIT HIGH.
P04DB	CRANKCASE VENTILATION SYSTEM (PCV) DISCONNECTED	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P04DB CRANKCASE VENTILATION SYSTEM (PCV) DISCONNECTED.
P04AF	EVAP SYSTEM PURGE CONTROL VALVE (CPC) "B" STUCK CLOSED	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P04AF EVAP SYSTEM PURGE CONTROL VALVE (CPC) "B" STUCK CLOSED.
P04F0	EVAP SYSTEM HIGH PRESSURE PURGE LINE (CPC2) PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P04F0 EVAP SYSTEM HIGH PRESSURE PURGE LINE (CPC2) PERFORMANCE.
P0500	VEHICLE SPEED SENSOR "A" CIRCUIT	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0500 VEHICLE SPEED SENSOR "A" CIRCUIT.
P0506	IDLE CONTROL SYSTEM RPM - LOWER THAN EXPECTED	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0506 IDLE CONTROL SYSTEM RPM - LOWER THAN EXPECTED.
P0507	IDLE CONTROL SYSTEM RPM - HIGHER THAN EXPECTED	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0507 IDLE CONTROL SYSTEM RPM - HIGHER THAN EXPECTED.
P050A	COLD START IDLE CONTROL SYSTEM PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P050A COLD START IDLE CONTROL SYSTEM PERFORMANCE.
P050B	COLD START IGNITION TIMING PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P050B COLD START IGNITION TIMING PERFORMANCE.
P0512	STARTER (SWITCH) REQUEST CIRCUIT	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0512 STARTER (SWITCH) REQUEST CIRCUIT.
P0516	BATTERY TEMPERATURE SENSOR CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0516














		BATTERY TEMPERATURE SENSOR CIRCUIT LOW.
P0517	BATTERY TEMPERATURE SENSOR CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0517 BATTERY TEMPERATURE SENSOR CIRCUIT HIGH.
P0560	SYSTEM VOLTAGE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0560 SYSTEM VOLTAGE.
P0604	INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR.
P0605	INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0605 INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR.
P0606	CONTROL MODULE PROCESSOR	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0606 CONTROL MODULE PROCESSOR.
P060A	INTERNAL CONTROL MODULE MONITORING PROCESSOR PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P060A INTERNAL CONTROL MODULE MONITORING PROCESSOR PERFORMANCE.
P060B	INTERNAL CONTROL MODULE A/D PROCESSING PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P060B INTERNAL CONTROL MODULE A/D PROCESSING PERFORMANCE.
P0616	STARTER RELAY "A" CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0616 STARTER RELAY "A" CIRCUIT LOW.
P0617	STARTER RELAY "A" CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0617 STARTER RELAY "A" CIRCUIT HIGH.
P062D	FUEL INJECTOR DRIVER CIRCUIT PERFORMANCE BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P062D FUEL INJECTOR DRIVER CIRCUIT PERFORMANCE BANK 1.
P062F	INTERNAL CONTROL MODULE EEPROM ERROR	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P062F INTERNAL CONTROL MODULE EEPROM ERROR.
P0685	ECM/PCM POWER RELAY CONTROL CIRCUIT/OPEN	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0685 ECM/PCM POWER RELAY CONTROL CIRCUIT/OPEN.
P0700	TRANSMISSION CONTROL SYSTEM (MIL REQUEST)	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0700 TRANSMISSION CONTROL SYSTEM (MIL REQUEST).





P081A	STARTER DISABLE CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P081A STARTER DISABLE CIRCUIT LOW.
P0851	PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0851 PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW.
P0852	PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0852 PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH.
P1134	A/F / O2 SENSOR BANK1 SENSOR1 SERIAL PERIPHERAL INTERFACE (SPI) COMMUNICATION	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1134 A/F / O2 SENSOR BANK1 SENSOR1 SERIAL PERIPHERAL INTERFACE (SPI) COMMUNICATION.
P1160	THROTTLE RETURN SPRING	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1160 THROTTLE RETURN SPRING.
P1191	FUEL RAIL PRESSURE SENSOR "A" CIRCUIT NO ACTIVITY DETECTED	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1191 FUEL RAIL PRESSURE SENSOR "A" CIRCUIT NO ACTIVITY DETECTED.
P1261	CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1261 CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN.
P1262	CYLINDER 2 DIRECT FUEL INJECTOR CIRCUIT/OPEN	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1262 CYLINDER 2 DIRECT FUEL INJECTOR CIRCUIT/OPEN.
P1263	CYLINDER 3 DIRECT FUEL INJECTOR CIRCUIT/OPEN	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1263 CYLINDER 3 DIRECT FUEL INJECTOR CIRCUIT/OPEN.
P1264	CYLINDER 4 DIRECT FUEL INJECTOR CIRCUIT/OPEN	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1264 CYLINDER 4 DIRECT FUEL INJECTOR CIRCUIT/OPEN.
P1449	EVAP SYSTEM CLOG DETECTED (AIR FILTER)	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1449 EVAP SYSTEM CLOG DETECTED (AIR FILTER).
P1451	EVAP SYSTEM CLOG DETECTED (PIPE)	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1451 EVAP SYSTEM CLOG DETECTED (PIPE).
P1492	COIL 1 EGR "A" CONTROL CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1492 COIL 1 EGR "A" CONTROL CIRCUIT LOW.
P1493	COIL 1 EGR "A" CONTROL CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1493 COIL 1 EGR "A" CONTROL CIRCUIT HIGH.

P1494	COIL 2 EGR "A" CONTROL CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1494 COIL 2 EGR "A" CONTROL CIRCUIT LOW.
P1495	COIL 2 EGR "A" CONTROL CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1495 COIL 2 EGR "A" CONTROL CIRCUIT HIGH.
P1496	COIL 3 EGR "A" CONTROL CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1496 COIL 3 EGR "A" CONTROL CIRCUIT LOW.
P1497	COIL 3 EGR "A" CONTROL CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1497 COIL 3 EGR "A" CONTROL CIRCUIT HIGH.
P1498	COIL 4 EGR "A" CONTROL CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1498 COIL 4 EGR "A" CONTROL CIRCUIT LOW.
P1499	COIL 4 EGR "A" CONTROL CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1499 COIL 4 EGR "A" CONTROL CIRCUIT HIGH.
P1530	BATTERY CURRENT SENSOR CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1530 BATTERY CURRENT SENSOR CIRCUIT LOW.
P1531	BATTERY CURRENT SENSOR CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1531 BATTERY CURRENT SENSOR CIRCUIT HIGH.
P1532	BATTERY CHARGING SYSTEM	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1532 BATTERY CHARGING SYSTEM.
P1603	ENGINE STALL HISTORY	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1603 ENGINE STALL HISTORY.
P1604	STARTABILITY MALFUNCTION	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1604 STARTABILITY MALFUNCTION.
P2004	TGV CONTROL STUCK OPEN BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2004 TGV CONTROL STUCK OPEN BANK 1.
P2005	TGV CONTROL STUCK OPEN BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2005 TGV CONTROL STUCK OPEN BANK 2.
P2006	TGV CONTROL STUCK CLOSED BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2006 TGV CONTROL STUCK CLOSED BANK 1.
P2007	TGV CONTROL STUCK CLOSED BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2007

		TGV CONTROL STUCK CLOSED BANK 2.
P2009	TGV CONTROL CIRCUIT LOW BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2009 TGV CONTROL CIRCUIT LOW BANK 1.
P2012	TGV CONTROL CIRCUIT LOW BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2012 TGV CONTROL CIRCUIT LOW BANK 2.
P2016	TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2016 TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 1.
P2017	TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2017 TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 1.
P2021	TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2021 TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 2.
P2022	TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2022 TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 2.
P2096	POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2096 POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1.
P2097	POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2097 POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1.
P2101	THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2101 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE.
P2102	THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2102 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT LOW.
P2103	THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2103 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT HIGH.
P2109	THROTTLE/PEDAL POSITION SENSOR "A" MINIMUM STOP PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2109 THROTTLE/PEDAL POSITION SENSOR "A" MINIMUM STOP PERFORMANCE.
P2119	THROTTLE ACTUATOR "A" CONTROL THROTTLE BODY RANGE/PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2119 THROTTLE ACTUATOR "A" CONTROL THROTTLE BODY RANGE/PERFORMANCE.
P2122	THROTTLE/PEDAL	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic

	POSITION SENSOR/SWITCH "D" CIRCUIT LOW	Procedure with Diagnostic Trouble Code (DTC)>DTC P2122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT LOW.
P2123	THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH.
P2127	THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2127 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW.
P2128	THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2128 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH.
P2135	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE CORRELATION	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2135 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE CORRELATION.
P2138	THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE CORRELATION	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2138 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE CORRELATION.
P2146	FUEL INJECTOR GROUP "A" SUPPLY VOLTAGE CIRCUIT/OPEN	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2146 FUEL INJECTOR GROUP "A" SUPPLY VOLTAGE CIRCUIT/OPEN.
P2195	A/F /O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2195 A/F /O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 1.
P2196	A/F /O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 1	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2196 A/F /O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 1.
P219A	BANK 1 AIR-FUEL RATIO IMBALANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P219A BANK 1 AIR-FUEL RATIO IMBALANCE.
P2227	BAROMETRIC PRESSURE SENSOR "A" CIRCUIT RANGE/PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2227 BAROMETRIC PRESSURE SENSOR "A" CIRCUIT RANGE/PERFORMANCE.
P2228	BAROMETRIC PRESSURE SENSOR "A" CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2228

		BAROMETRIC PRESSURE SENSOR "A" CIRCUIT LOW.
P2229	BAROMETRIC PRESSURE SENSOR "A" CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2229 BAROMETRIC PRESSURE SENSOR "A" CIRCUIT HIGH.
P2270	O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2270 O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 2.
P2271	O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 2	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2271 O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 2.
P2401	EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2401 EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT LOW.
P2402	EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2402 EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT HIGH.
P2404	EVAP SYSTEM LEAK DETECTION PUMP SENSE CIRCUIT RANGE/PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2404 EVAP SYSTEM LEAK DETECTION PUMP SENSE CIRCUIT RANGE/PERFORMANCE.
P2419	EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT LOW	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2419 EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT LOW.
P2420	EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT HIGH	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2420 EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT HIGH.
P2530	IGNITION SWITCH RUN POSITION CIRCUIT	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2530 IGNITION SWITCH RUN POSITION CIRCUIT.
P2610	ECM/PCM ENGINE OFF TIMER PERFORMANCE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2610 ECM/PCM ENGINE OFF TIMER PERFORMANCE.
U0073	CONTROL MODULE COMMUNICATION BUS "A" OFF	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS "A" OFF.
U0101	LOST COMMUNICATION WITH TCM	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122


	CONTROL MODULE	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0402	INVALID DATA RECEIVED FROM TCM	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0402 INVALID DATA RECEIVED FROM TCM.
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	 Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.

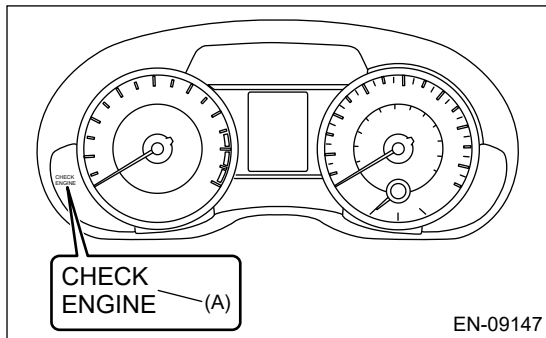
ENGINE (DIAGNOSTICS)(H4DOTC) > Malfunction Indicator Light

ACTIVATION OF MALFUNCTION INDICATOR LIGHT

1. When the ignition switch is turned to ON (engine OFF), the malfunction indicator light in the combination meter illuminates.

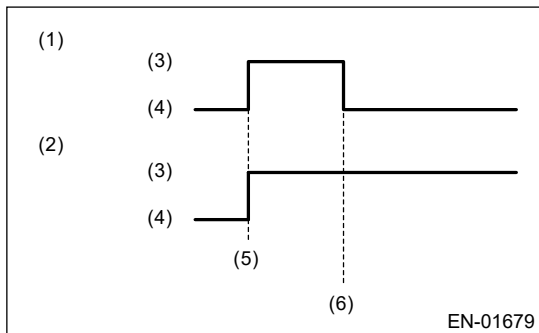
Note:

If the malfunction indicator light does not illuminate, perform diagnostics of the malfunction indicator light circuit or the combination meter circuit.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Malfunction Indicator Light>MALFUNCTION INDICATOR LIGHT DOES NOT COME ON.](#)



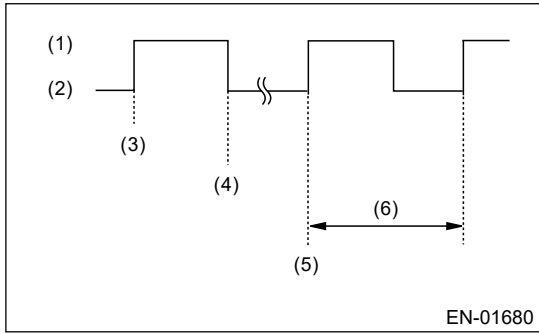
(A) Malfunction indicator light

2. After starting the engine, the malfunction indicator light goes out. If it does not go off, any of the engine and emission control system has malfunction.



- (1) No DTC
- (2) Trouble occurs
- (3) ON
- (4) OFF
- (5) Ignition switch ON
- (6) Engine start

3. If the diagnostic system detects a misfire which could damage the catalyst, the malfunction indicator light will blink at a cycle of 1 Hz.



- (1) ON
- (2) OFF
- (3) Ignition switch ON
- (4) Engine start
- (5) Misfire start
- (6) 1 second


ENGINE (DIAGNOSTICS)(H4DOTC) > Malfunction Indicator Light

MALFUNCTION INDICATOR LIGHT DOES NOT COME ON

Trouble symptom:

When the ignition switch is turned to ON (engine OFF), malfunction indicator light does not illuminate.

Note:

Refer to IDI section for diagnostic procedure.  Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

ENGINE (DIAGNOSTICS)(H4DOTC) > Malfunction Indicator Light


MALFUNCTION INDICATOR LIGHT DOES NOT GO OFF

Trouble symptom:



Although malfunction indicator light comes on when the engine runs, DTC is not shown on the Subaru Select Monitor or general scan tool display.

1. CHECK DTC.




Is DTC of engine or LAN system displayed?  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\)>OPERATION.](#)

Yes

Check the appropriate DTC using the "List of Diagnostic Trouble Code (DTC)".
 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Check the combination meter system.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

ENGINE (DIAGNOSTICS)(H4DOTC) > Malfunction Indicator Light

PROCEDURE

1. Activation of malfunction indicator light.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Malfunction Indicator Light>ACTIVATION OF MALFUNCTION INDICATOR LIGHT.](#)



2. Malfunction indicator light does not come on.  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Malfunction Indicator Light>MALFUNCTION INDICATOR LIGHT DOES NOT COME ON.](#)



3. Malfunction indicator light does not go off  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Malfunction Indicator Light>MALFUNCTION INDICATOR LIGHT DOES NOT GO OFF.](#)


ENGINE (DIAGNOSTICS)(H4DOTC) > Read Diagnostic Trouble Code (DTC)

OPERATION

1. SUBARU SELECT MONITOR


1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Engine Control System] and select [Enter].
5. On [Select Function] display, select [DTC].

Note:

- For detailed operation procedures, refer to “PC application help for Subaru Select Monitor”.
- For details concerning DTC, refer to “List of Diagnostic Trouble Code (DTC)”.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

2. GENERAL SCAN TOOL

Refer to data denoting emission-related powertrain DTC.

For details concerning DTC, refer to “List of Diagnostic Trouble Code (DTC)”.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>List of Diagnostic Trouble Code \(DTC\).](#)

Note:

Refer to general scan tool manufacturer’s instruction manual to access powertrain DTC (MODE \$03).

OPERATION**1. HOW TO USE SUBARU SELECT MONITOR****Note:**

For detailed operation procedures, refer to "PC application help for Subaru Select Monitor".

2. DATA MONITOR**Note:**

- For detailed operation procedures, refer to "PC application help for Subaru Select Monitor".
- A list of the support data is shown in the following table.
- *: For models without cruise control, the brake switch signal does not change.

1. On [Start] display, select [Diagnosis].

2. On [Vehicle selection] display, enter vehicle information and select [OK].

3. On [Main Menu] display, select [Each System].

4. On [Select System] display, select [Engine Control System] and select [Enter].

5. On [Select Function] display, select [Data monitor].

Item	Contents	Note (at idling)	Remarks
Engine Speed	Value calculated from crankshaft position sensor output value.	729 rpm	rpm
Air Flow Rate from Mass Air Flow Sensor	Value calculated from air flow sensor output value.	2.4 g/s	g/s or lb/m
Vehicle Speed Sensor	Value calculated from vehicle speed sensor output value.	0 km/h	km/h or MPH
Throttle Opening Angle	Throttle valve opening angle (in percentage) calculated from throttle position sensor output value.	12%	%
Accel. Opening Angle	Accelerator pedal opening angle (in percentage) calculated from accelerator pedal position sensor output value.	0.0%	%
A/F Sensor #1	Actual lambda value calculated from front oxygen (A/F) sensor output value.	1.01	—
Ignition timing cyl. #1	Ignition timing control value for No. 1 cylinder. Calculated from rotation speed, manifold pressure, intake air temperature, water temperature, and data from knock sensor etc.	6.0°	°
Coolant Temp.	Value calculated from engine coolant temperature sensor output value.	92°C	°C or °F
Fuel Injection #1 Pulse	Control value of fuel injection time for the RH bank.	0.51 ms	ms
Short Term Fuel Trim (B1)	Air fuel ratio correction control value for the front oxygen (A/F) sensor.	0.8%	%
Long Term Fuel Trim	Air fuel ratio learning control value for the	3.1%	%

(B1)	front oxygen (A/F) sensor.		
Learned Ignition Timing	Ignition timing learning value. Advance angle amount or retard angle amount when knocking occurs.	0.0 deg	deg
Mani. Absolute Pressure	Value calculated from the manifold pressure sensor.	26 kPa	kPa, mmHg, inHg or psig
Bank 1 - Sensor 2 present at that location	Rear oxygen sensor output voltage value.	0.895 V	V
VVT Adv. Ang. Amount R	AVCS advance angle amount for the RH bank on the intake side.	27 deg	deg
VVT Advance Target Angle Amount R	AVCS target advance angle amount for the RH bank on the intake side. This value is compared with the AVCS advance angle amount R to judge if the intake AVCS is operating properly. Response delays during the transition time.	0 deg	deg
VVT Adv. Ang. Amount L	AVCS advance angle amount for the LH bank on the intake side.	27 deg	deg
VVT Advance Target Angle Amount L	AVCS target advance angle amount for the LH bank on the intake side. This value is compared with the AVCS advance angle amount L to judge if the intake AVCS is operating properly. Response delays during the transition time.	0 deg	deg
Exh. VVT Retard Ang. R	AVCS actual retard angle amount for the RH bank on the exhaust side.	0 deg	deg
Ex VVT Retard Target Angle R	AVCS target retard angle amount for the RH bank on the exhaust side. This value is compared with the exhaust AVCS retard angle amount R to judge if the AVCS is operating properly. Response delays during the transition time.	108.9°C	°C
Exh. VVT Retard Ang. L	AVCS actual retard angle amount for the LH bank on the exhaust side.	0 deg	deg
Ex VVT Retard Target Angle L	AVCS target retard angle amount for the LH bank on the exhaust side. This value is compared with the exhaust AVCS retard angle amount L to judge if the AVCS is operating properly. Response delays during the transition time.	108.9°C	°C
VVT Initial Position Learning Value #1	AVCS initial position learning value for the RH bank on the intake side. Controls the angle against a standard angle. Deviation learning is performed based on this standard value.	78.9 °C	°C
VVT Initial Position	AVCS initial position learning value for the LH	82.4 °C	°C

Learning Value #2	bank on the intake side. Controls the angle against a standard angle. Deviation learning is performed based on this standard value.		
VVT Ex Initial Position Learning Value #1	AVCS initial position learning value for the RH bank on the exhaust side. Controls the angle against a standard angle. Deviation learning is performed based on this standard value.	110.3 °CA	°CA
VVT Ex Initial Position Learning Value #2	AVCS initial position learning value for the LH bank on the exhaust side. Controls the angle against a standard angle. Deviation learning is performed based on this standard value.	108.9 °CA	°CA
Control module voltage	ECM input power supply voltage.	13.924 V	V
Target engine speed	ECM target engine speed.	700 rpm	rpm
Target Equivalence Ratio	Target air fuel ratio (lambda). It usually becomes 1.0 aiming at a theoretical air fuel ratio.	0.999	—
Oil Temperature	Value calculated from the engine oil temperature sensor output value.	96°C	°C or °F
Intake Air Temperature (B1-S1)	Value calculated from the intake air temperature sensor output value of the air flow sensor.	50°C	°C or °F
Intake Air Temperature (B1-S2)	Value calculated from the intake air temperature sensor output value of the manifold pressure sensor.	70°C	°C or °F
Ambient air temperature	Value that ECM estimates by using input values from the engine coolant temperature sensor or the intake air temperature sensor etc.	—	°C or °F
Calculated LOAD Value	Current rate of air amount. Value assuming that the air amount at the current engine speed with the throttle fully open is 100%.	21.2%	%
Absolute Load Value	Percentage of current intake air amount against the maximum air intake amount of the engine. For non-turbo engine, the value can be close to 95%, but will never be 100%. For turbo engine, this value may exceed 100% due to a boost pressure.	17.3%	%
Barometric Pressure	Value calculated from atmospheric pressure sensor output value.	99 kPa	kPa, mmHg, inHg or psig
Mani. Relative Pressure	Pressure value calculated from manifold pressure sensor output value. (Absolute	(Air intake absolute pressure —	kPa, mmHg,

	value) (Air intake absolute pressure – Atmospheric pressure)	Atmospheric pressure)	inHg or psig
Primary Control	Boost pressure control value. Control duty ratio of the boost pressure control solenoid valve. ECM output value.	0.0%	%
Target Throttle Opening Angle	Target throttle opening angle calculated by ECM.	2 deg	deg
Actual Throttle Opening Angle	Actual throttle opening angle. Calculated by ECM based on the throttle sensor input value.	2 deg	deg
Commanded Throttle Actuator Control	Control value of the target throttle opening angle calculated by ECM. Shows the target value of opening angle in percentage when 0% means fully closed and 100% means fully open.	3.1%	%
Relative Throttle Position	Current throttle opening angle in percentage against the throttle voltage (full range) that has reflected the full close point learning value. The value will be approx. 70% at full open.	2.0%	%
Throttle Motor Voltage	Power supply voltage of the throttle motor. Input value to ECM.	13.8 V	V
Main-Throttle Sensor	Voltage value of the main throttle position sensor. Input value to ECM.	0.62 V	V
Sub-Throttle Sensor	Voltage value of the sub throttle position sensor. Input value to ECM.	0.60 V	V
Throttle Motor Duty	Throttle motor control duty ratio. ECM output value.	-33%	%
Main-Accelerator Sensor	Voltage value of the main accelerator pedal position sensor. Input value to ECM.	0.68 V	V
Sub-Accelerator Sensor	Voltage value of the sub accelerator pedal position sensor. Input value to ECM.	0.68 V	V
Idle Mass Air Flow	Air volume correction value to maintain the target rotation speed in each water temperature. Corrects air volume when the water temperature changes. It includes values of the feedback correction amount and the learning value.	3.00 g/s	g/s
Idle Mass Air Flow Feedback correct	Air volume compensation value of ISC as a feedback correction to stabilize the idling speed.	0.00 g/s	g/s

ISC Learning Value	Learning control value of ISC. After warming up, learning control is executed to reduce the ISC feedback correction to zero, in order to stabilize the engine speed.	0.55 g/s	g/s
Idle A/C load correct	Air volume correction when the air conditioner is turned on. ECM corrects the air volume against the target rotation speed when the air conditioner is turned ON.	0.86 g/s	g/s
Electric Load Feedback Val	Air volume correction value when an electric load is turned on. ECM corrects the air volume against the set target rotation speed when the electric load is turned ON.	0 g/s	g/s
Idle dirty throttle correct	Calculates the ISC learning values on a long-term basis, and judges as an ISC dirty throttle correction when the learning value increases gradually. When carbon or other dirt accumulates on the ISC throttle and make the throttle dirty, air volume decreases when the throttle is fully closed. The ECM increases the amount of compensation air to keep the rotation speed.	0 g/s	g/s
Air Flow Sensor Voltage	Air flow sensor output value. Input value to ECM.	0.8 V	V
Fuel Rail Pressure A	Fuel pressure sensor output value set to the high pressure fuel line. Output value to ECM.	3,990 kPa	kPa
Commanded Fuel Rail Pressure A	Target fuel pressure for high pressure fuel line calculated by ECM.	4,300 kPa	kPa
Fuel Level Input	Fuel level sensor output value. Input value to ECM. Total value of main and sub.	—	%
Fuel level resistance	Fuel level sensor output value. Input value to ECM. Total value of main and sub.	—	Ω
Fuel Pump Duty	Display of the fuel pump duty ratio. Supply voltage of the fuel pump is under a duty control by the ECM. This value shows the duty ratio. While the amount of fuel supply is small, such as during idling, the duty value is lowered to decrease the supply voltage.	65%	%
Commanded Evaporative Purge	Evaporative purge rate displayed by the OBD.	0.0%	%
CPC Valve Duty Ratio	Control duty ratio of the purge control solenoid valve.	0%	%

	ECM output value.		
Purge Density Learn Value	Leaning value of the evaporation gas density purged from the canister. ECM displays the estimated leaning value.	0.0 %	%
Evap Purge Flow	Purge ratio when the evaporation gas is purged from the canister. ECM performs a duty drive to the purge solenoid valve. The amount of gas actually purged will vary depending on the vacuum pressure difference before/after the solenoid valve. Purge ratio displayed here shows current purge amount in percentage against the maximum purge amount when the maximum vacuum pressure is applied.	0.0 %	%
ALT Duty	Value calculated by the ECM as an electric power generation voltage. Indicator voltage value from ECM to alternator is under a DUTY control.	69%	%
Alternator control mode	Control mode of the electric power generation voltage by the alternator. Low: Mode that controls the battery charge Mid: Mode where the battery is not charged and discharged High: Mode that fixes the voltage when the battery is charged or when an electric load is turned on ExHigh: Mode where the battery is charged during deceleration	High/Mid/Low	—
Battery current value	Battery charge/discharge current value input from the battery sensor. When the value is positive: The current flows to a direction that the battery is charged. When the value is negative: The current flows to a direction that the battery is discharged.	1 A	A
Battery temperature	Value calculated from battery temperature sensor output value.	47°C	Celsius
Knocking Correction	Retard angle amount when knocking occurs. Partially learning value of ignition timing learning value.	0.0 deg	deg
Fuel system for Bank 1	Feedback status of air fuel ratio. Open: Feedback is stopped Closed: Feedback control is being performed	Cl_normal	—
A/F Sensor #1 Current	Front oxygen (A/F) sensor output current value. Input value to ECM.	0.00 mA	mA
A/F Sensor #1 Resistance	Value calculated from the front oxygen (A/F) sensor output value.	79 Ω	Ω
A/F Correction #3	Sub correction value of A/F feedback control.	-1.41%	%

Front O2 Heater #1	Current value controlling the front oxygen (A/F) sensor heater. ECM output value.	0.00 A	A
Rear O2 Heater Current	Current value controlling the rear oxygen sensor heater. ECM output value.	0.00 A	A
No. of EGR steps	Number of EGR valve steps. Number of stepping motor steps. ECM output value.	0 STEP	STEP
Commanded EGR	Target value as EGR setting value calculated by ECM.	0.0%	%
EGR Error	Percentage of the difference in actual EGR steps as compared to the target EGR steps. Both a positive value and a negative value mean that it doesn't fulfill the target. When the value is positive: It opens larger than the target value. When the value is negative: It opens smaller than the target value.	0.0%	%
TGV Position Sensor R	Tumble generator valve position sensor RH output value. Input value to ECM.	Closing direction: 2.38 — 3.93 Opening direction: 0.43 — 1.19	V
TGV Position Sensor L	Tumble generator valve position sensor LH output value. Input value to ECM.	Closing direction: 0.43 — 1.19 Opening direction: 2.38 — 3.93	V
TGV Output	Drive signal to tumble generator valve motor. Set to "ON" when the tumble generator valve is activated (when the duty output is other than 0%). ECM output value.	None	—
TGV Drive	Tumble generator valve drive status. Set to "Open" when the tumble generator valve is open. ECM control status.	Closing direction	—
OCV Duty R	Control duty ratio of the intake side oil control solenoid on the RH bank. ECM output value.	58.8%	%
OCV Duty L	Control duty ratio of the intake side oil control solenoid on the LH bank. ECM output value.	58.4%	%
OCV Current R	Actual current value of the intake side oil control solenoid on the RH bank. Input value to ECM.	704 mA	mA
OCV Current L	Actual current value of the intake side oil control solenoid on the LH bank. Input value to ECM.	736 mA	mA

Exh. OCV Duty R	Control duty ratio of the exhaust side oil control solenoid on the RH bank. ECM output value.	45.9%	%
Exh. OCV Duty L	Control duty ratio of the exhaust side oil control solenoid on the LH bank. ECM output value.	45.9%	%
Exh. OCV Current R	Actual current value of the oil control valve on the exhaust side for RH bank, and ECM input value.	544 mA	mA
Exh. OCV Current L	Actual current value of the oil control valve on the exhaust side for LH bank, and ECM input value.	544 mA	mA
Roughness Monitor #1	#1 cylinder roughness monitor count value.	0	—
Roughness Monitor #2	#2 cylinder roughness monitor count value.	0	—
Roughness Monitor #3	#3 cylinder roughness monitor count value.	0	—
Roughness Monitor #4	#4 cylinder roughness monitor count value.	0	—
Cylinder Monitor #1	Calculates the rotation speed between certain angles on the #1 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	0	—
Cylinder Monitor #2	Calculates the rotation speed between certain angles on the #2 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	0	—
Cylinder Monitor #3	Calculates the rotation speed between certain angles on the #3 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	0	—
Cylinder Monitor #4	Calculates the rotation speed between certain angles on the #4 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	0	—
Trip Count	Time stamp information. Number of times the ignition is ON since the vehicle was manufactured. The number of ignition ON is also recorded when a trouble code is recorded, so the	—	Time

	comparison with that number will show you how many times the ignition has turned on since the diagnostic code was recorded.		
Count	Time stamp information. Each unit individually counts the elapsed time since the ignition is turned to ON. Master integrated unit and ECM synchronize with the master time. When synchronized: "Common" When not synchronized: "Originally"	Common	—
Time Count	Time stamp information. Elapsed time after ignition ON. When a trouble code is recorded, the elapsed time after ignition ON is also recorded.	—	ms
Time Since Engine Start	Elapsed time after starting the engine.	—	sec
Timer after start	Elapsed time after starting the engine. This value is used for control.	—	sec
Accumulation Time After Engine Run	Cumulative time after starting the engine. For models with Auto Start Stop, cumulative time after the first engine start. Time is not accumulated while the engine stops due to the Auto Start Stop system.	—	sec
Initial Engine Oil Temp	Oil temperature when starting the engine, which is input to ECM from the oil temperature sensor.	—	Celsius
Initial Engine Coolant Temp.	Water temperature when starting the engine, which is input to ECM from the water temperature sensor.	—	Celsius
Initial Intake Air Temp.	Intake air temperature when starting the engine, which is input to ECM from the intake air temperature sensor.	—	Celsius
Engine Starting Time	Time needed since the cranking started till the judgment of engine start is complete.	0 min	ms
IG OFF Elapsed Time	The time the vehicle has been left since the engine stopped. Shows the elapsed time after turning OFF the ignition switch.	—	sec
Distance traveled since DTC(s) cleared	Travel distance after DTC clear.	—	km or mile
Engine run time while MIL is illuminated	Engine operating time from when the malfunction indicator light illuminated till when it went off.	0 min	min
Engine run time since DTC(s) cleared	Elapsed time after DTC clear.	—	min
Number of Warm-ups since DTC(s) cleared	Number of warm ups after DTC clear. 1 cycle is the time from the cold start till warmed up and stop. (Engine start after a	—	Time

	warm-up is not counted.)		
Distance Traveled While MIL is Illuminated	Travel distance after the warning light illuminated.	—	km or mile
Odometer	Value of the total cumulative travel distance that ECM calculates from the vehicle speed separately from the odometer in the combination meter. Small difference from the odometer will be possible, but if there is a big difference, ECM or the combination meter may need to be replaced.	—	km or mile
Fuel Cut Elps Time	Elapsed time after experienced high rotation speed.	0 sec	sec
Memorized Cruise Speed	Cruise control system target vehicle speed. (Set speed)	0 km/h	km/h or MPH
Catalyst Temperature (B1-S1)	Estimated temperature of the front catalytic converter.	259.5°C	Celsius
Type of fuel currently being utilized by the vehicle	Fuel information recorded in the ECM. Not the fuel information currently used.	GAS	—
Auto Trans Neutral Drive Status	Neutral condition. Information input from the inhibitor switch. (CVT model)	NEUT	—
Evap System Vapor Pressure	Evaporative emission control system pressure value. Pressure sensor output value.	99 kPa	kPa, mmHg, inHg or psig
X mode	X mode ON or OFF status.	OFF	—
SI Drive mode(Display)	SI-DRIVE mode status. ECM output value. Displayed only on models with SI-DRIVE.	I, S or S#	—
Neutral Position Switch	Neutral switch signal. Signal when in neutral (MT) or in P or N range (AT). Input value to ECM.	Neutral	—
ETC Motor Relay	Drive signal to the electronic throttle motor relay. Set to "ON" when the drive signal is output. ECM output value.	ON	—
Stop Light Switch	Stop light switch signal. Set to "ON" when the stop light illuminates. (MT model) Input value to ECM.	OFF (when OFF)	—
Brake Switch	Brake switch signal.	*OFF (when OFF)	—

	Set to "ON" when the brake pedal is depressed. Input value to ECM.		
Idle Switch Signal	Idle signal. Set to "Idle" while idling.	At idle	—
Ignition Switch	Ignition switch signal. Set to "ON" when the ignition switch is ON.	ON input	—
A/C Mid Pressure Switch	Air conditioner middle pressure switch signal. Set to "ON" when the switch is ON. Input value to ECM.	OFF input (at OFF)	—
A/C Compressor Signal	A/C compressor drive signal. Set to "ON" when the drive signal is output. ECM output value.	OFF output (when OFF)	—
Radiator Fan Relay #1	Radiator fan relay drive signal. Set to "ON" when the drive signal is output. ECM output value.	OFF output (when OFF)	—
Radiator Fan Relay #2	Radiator fan relay drive signal. Set to "ON" when the drive signal is output. ECM output value.	OFF output (when OFF)	—
A/C Switch	Air conditioner switch signal. Set to "ON" when the air conditioner switch of the heater control is ON. Input value to ECM.	OFF input (at OFF)	—
Starter Switch	Starter switch signal. Set to "ON" when the starter is ON. Input value to ECM.	OFF input	—
Rear Defogger SW	Rear defogger switch input signal. Set to "ON" when the switch is ON. Input value to ECM.	OFF input (at OFF)	—
Blower Fan SW	Blower fan switch input signal. Set to "ON" when the switch is ON. Input value to ECM.	OFF input (at OFF)	—
Light Switch	Light switch input signal. Set to "ON" when the switch is ON. Input value to ECM.	OFF input (at OFF)	—
Wiper Switch	Wiper switch input signal. Set to "ON" when the switch is ON. Input value to ECM.	OFF input (at OFF)	—
Delivery Mode Connector	Delivery mode terminal fuse installation status. Shows the status of delivery mode.	OFF	—
Rear O2 Rich Signal	Rear oxygen sensor output value. Displays "Rich" when the air fuel ratio of rear oxygen sensor is rich. Displays "Lean" when the air fuel ratio of rear oxygen sensor is lean.	Rich	—
Knocking Signal	Knock sensor output signal. Judges if a knocking occurs or not. Input value to ECM.	None	—

Crankshaft Position Sig.	Crankshaft position sensor output signal. Set to "ON" when the engine is running. Input value to ECM.	ON	—
Camshaft Position Sig.	Camshaft position sensor output signal. Set to "ON" when the engine is running. Input value to ECM.	ON	—
CPC Solenoid 2	Drive status of the evaporative purge solenoid located upstream of the throttle, equipped with turbo models. ECM output value.	OFF	—
Ban of Torque Down	Torque down prohibition notification signal to the vehicle dynamics control (VDC) module. Set to "OFF" when the prohibition signal is output. ECM output value.	ON	—
Request Torque Down VDC	Torque down request signal transmitted from the vehicle dynamics control (VDC) module. Set to "ON" when the request signal is sent. Vehicle dynamics control (VDC) module input value.	None	—
Torque Permission Signal	Torque down permission notification signal to the transmission control module. Set to "ON" when the permission signal is output. ECM output value.	Prohibited	—
SET/COAST Switch	Cruise control system SET/COAST SW signal. Set to "ON" when the switch is operated. Input value to ECM.	OFF (when OFF)	—
RESUME/ACCEL Switch	Cruise control system RESUME/ACCEL SW signal. Set to "ON" when the switch is operated. Input value to ECM.	OFF (when OFF)	—
Main Switch	Cruise control system main switch signal. Set to "ON" when the switch is operated. Input value to ECM.	OFF (when OFF)	—
distance change SW	Distance change switch signal. Displayed only on models with EyeSight.	OFF (when OFF)	—
CC Cancel SW	Cruise control cancel switch signal of the cruise control system. Set to "ON" when the switch is operated. Input value to ECM.	OFF (when OFF)	—
All Cylinders Fuel cut	Status under the fuel injection amount control where the fuel injection is cut off in all cylinders.	OFF	—
Immobilizer Fuel Cut Status	Status where the fuel injection is cut off by the command from immobilizer.	OFF	—
Shift Pattern Demand for Low Water Temperature	Shift pattern request sent from ECM to the transmission CM.	OFF	—

	When the water temperature is low, shift pattern change to the low speed side is requested to raise the catalyst temperature faster.		
Oil level switch	Oil level switch signal. Set to "LOW level" when the amount of engine oil decreases. Input value to ECM.	HIGH level	—
ELCM switching valve	Leak check valve assembly switching valve drive signal. Set to "Close" when closing the switching valve. ECM output value.	Open	—
ELCM pump	Leak check valve assembly pump drive signal. Set to "ON" when the leak check valve assembly decompression pump is activated. ECM output value.	OFF	—
AT turbine speed	Turbine rotation speed of the transmission. Turbine rotation speed is input from the transmission CM via CAN. (CVT model)	900	—
Lock up status	Lock-up status of the transmission. Lock up status is input from the transmission CM via CAN. (CVT model)	OPEN	—
P/N Signal	P/N status of the transmission. P/N range status is input from the transmission CM via CAN. (CVT model)	—	—
Ignition Control Check 1	Detailed status of the engine ignition control information.	90	—
Ignition Control Check 2	Detailed status of the engine ignition control information.	75	—
Malfunction Indicator Lamp (MIL) Status	Malfunction indicator light illumination status. When judged as abnormal, an illumination command signal is sent from ECM to the combination meter.	OFF	—
Number of DTCs	The number of trouble codes recorded in the ECM.	0	—
O2 Sensor #11	Installation status of the front oxygen (A/F) sensor.	Support	—
O2 Sensor #12	Installation status of the rear oxygen sensor.	Support	—
Short term fuel trim #12	Air fuel ratio correction control value of the rear oxygen sensor.	0.0%	%
A/F Sensor #11	Air fuel ratio calculated from the front oxygen (A/F) sensor output value. (Lambda)	1.007	—
A/F Sensor #11	Output voltage of the front oxygen (A/F) sensor.	2.329 V	V
A/F Sensor #11	Air fuel ratio calculated from the front	1.007	—

	oxygen (A/F) sensor output value. (Lambda)		
A/F Sensor #11	Front oxygen (A/F) sensor current value.	0.00 mA	mA
Absolute Throttle Position B	Shows the sub throttle sensor voltage value in % against the full-range 5 V throttle sensor output voltage.	12.2%	%
Accelerator Pedal Position D	Shows the main accelerator sensor voltage value in % against the full-range 5 V.	14.1%	%
Accelerator Pedal Position E	Shows the sub accelerator sensor voltage value in % against the full-range 5 V.	13.7%	%
Relative Accelerator Pedal Position	Accelerator opening angle with a full close point learning value taken into consideration.	0.0%	%
Misfire monitoring supported	Support status of the misfire diagnosis.	YES	—
Misfire monitoring ready	Status of the misfire diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	YES	—
Fuel system monitoring(Supp)	Support status of the fuel system diagnosis.	YES	—
Fuel system monitoring(Rdy)	Status of the fuel system diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	YES	—
Comprehensive component monitoring supported	Support status of the component diagnosis.	YES	—
Comprehensive component monitoring ready	Status of the component diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	YES	—
Catalyst monitoring supported	Support status of the catalyst diagnosis.	YES	—
Catalyst monitoring ready	Status of the catalyst diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
Heated catalyst monitoring supported	Support status of the heated catalyst diagnosis.	NO	—
Heated catalyst monitoring ready	Status of the heated catalyst diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
Evaporative purge system(Supp)	Support status of the evaporative purge system diagnosis.	NO	—
Evaporative purge system(Rdy)	Status of the evaporative purge system diagnosis.	N/A	—

	YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.		
Secondary air system(Supp)	Support status of the secondary air system diagnosis.	NO	—
Secondary air system(Rdy)	Status of the secondary air system diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
A/C system refrigerant(Supp)	Support status of the A/C system refrigerant diagnosis.	NO	—
A/C system refrigerant(Rdy)	Status of the A/C system refrigerant diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
Oxygen sensor monitoring supported	Shows the support status of oxygen sensor diagnosis.	YES	—
Oxygen sensor monitoring ready	Status of the oxygen sensor diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
O2 Heater Diagnosis(Supp)	Shows the support status of oxygen sensor heater diagnosis.	YES	—
O2 Heater Diagnosis(Rdy)	Status of the oxygen sensor heater diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	YES	—
EGR system(Supp)	Support status of the EGR diagnosis.	YES	—
EGR system(Rdy)	Status of the EGR diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
Misfire monitoring enabled	Shows whether or not the execution condition of misfire diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
Misfire monitoring completed	Shows whether or not the continuous misfire diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	YES	—
Fuel system monitoring(Enable)	Shows whether or not the execution condition of fuel system diagnosis is met. YES: Diagnosis can be executed.	YES	—

	NO or N/A: Diagnosis cannot be executed or is not supported.		
Fuel system monitoring(Comp)	Shows whether or not the fuel system diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	YES	—
Comprehensive component monitoring enabled	Shows whether or not the execution condition of component diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
Comprehensive component monitoring completed	Shows whether or not the component diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
Catalyst monitoring	Shows whether or not the execution condition of catalyst diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
Catalyst monitoring completed	Shows whether or not the catalyst diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
Heated catalyst monitoring	Shows whether or not the execution condition of heated catalyst diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	N/A	—
Heated catalyst monitoring completed	Shows whether or not the heated catalyst diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
Evaporative purge system(Enable)	Shows whether or not the execution condition of evaporative purge system diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	N/A	—
Evaporative purge system(Comp)	Shows whether or not the evaporative purge system diagnosis is completed. YES or N/A: Diagnosis is completed or not supported.	N/A	—

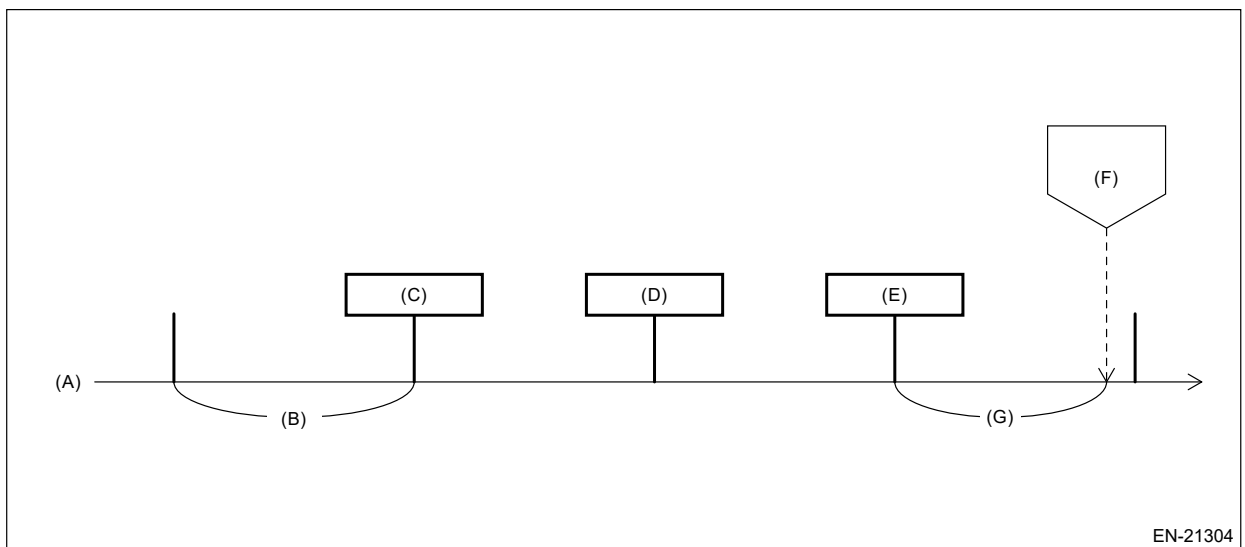
	NO: Diagnosis is not completed.		
Secondary air system(Enable)	Shows whether or not the execution condition of the secondary air system diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	N/A	—
Secondary air system(Comp)	Shows whether or not the secondary air system diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
A/C system refrigerant(Enable)	Shows whether or not the execution condition of A/C system refrigerant diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	N/A	—
A/C system refrigerant(Comp)	Shows whether or not the A/C system refrigerant diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
Oxygen sensor monitoring	Shows whether or not the execution condition of oxygen sensor diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
Oxygen sensor monitoring completed	Shows whether or not the oxygen sensor diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
O2 Heater Diagnosis(Enable)	Shows whether or not the execution condition of oxygen heater diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
O2 Heater Diagnosis(Comp)	Shows whether or not the oxygen heater diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	YES	—
EGR system(Enable)	Shows whether or not the execution condition of EGR diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
EGR system(Comp)	Shows whether or not the EGR diagnosis is	NO	—

	completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.		
Generic OBDII	Shows the OBD regulation to be followed. This is the information recorded in the ECM, and it does not mean that the unit automatically judges the compliance to the OBD regulations.	OBD/OBD2	—

3. FREEZE FRAME DATA

Note:

- ECM updates the freeze frame data every 0.5 seconds, and always keeps the last three records. Time-series freeze frame data includes the last three freeze frame data and the freeze frame data when the DTC is detected.
- In the time-series freeze frame data, freeze frame data at detection, one block before, two blocks before, and three blocks before are displayed.
- Time lag between the freeze frame at detection and the freeze frame data of one block before changes within the range of 0 – 0.5 seconds. This is because the freeze frame data at detection is recorded when the DTC is actually detected, while the freeze frame data of one block before is updated every 0.5 seconds.



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- (A) 0.5 seconds timer (D) «Two blocks before» (F) «Detect»
 (B) 0.5 seconds (E) «One block before» (G) Changes within the range of 0 – 0.5 seconds, depending on the timing of DTC detection.
 (C) «Three blocks before»

- When more than one DTCs are recorded, the time-series freeze frame data is recorded only for the first-detected DTC, and for the next DTC, just the freeze frame data of Detect is recorded. And for the subsequent DTCs, no freeze frame data is recorded.

- When performing diagnosis, you can utilize the time-series freeze frame data to guess the vehicle status when the DTC was detected.
 - For detailed operation procedures, refer to “PC application help for Subaru Select Monitor”.
 - A list of the support data is shown in the following table.
1. On [Start] display, select [Diagnosis].
 2. On [Vehicle selection] display, enter vehicle information and select [OK].
 3. On [Main Menu] display, select [Each System].
 4. On [Select System] display, select [Engine Control System] and select [Enter].
 5. On [Select Function] display, select [Data monitor].
 6. Select [FFD] of the DTC displayed in [DTC].

Item	Contents	Remarks
Engine Speed	Value calculated from crankshaft position sensor output value.	rpm
Air Flow Rate from Mass Air Flow Sensor	Value calculated from air flow sensor output value.	g/s or lb/m
Vehicle Speed Sensor	Value calculated from vehicle speed sensor output value.	km/h or MPH
Throttle Opening Angle	Throttle valve opening angle (in percentage) calculated from throttle position sensor output value.	%
Ignition timing cyl. #1	Ignition timing control value for No. 1 cylinder. Calculated from rotation speed, manifold pressure, intake air temperature, water temperature, and data from knock sensor etc.	°
Coolant Temp.	Value calculated from engine coolant temperature sensor output value.	°C or °F
Short Term Fuel Trim (B1)	Air fuel ratio correction control value for the front oxygen (A/F) sensor.	%
Long Term Fuel Trim (B1)	Air fuel ratio learning control value for the front oxygen (A/F) sensor.	%
Mani. Absolute Pressure	Value calculated from the manifold pressure sensor.	kPa, mmHg, inHg or psig
Bank 1 - Sensor 2 present at that location	Rear oxygen sensor output voltage value.	V
VVT Adv. Ang. Amount R	AVCS advance angle amount for the RH bank on the intake side.	deg
VVT Advance Target Angle Amount R	AVCS target advance angle amount for the RH bank on the intake side. This value is compared with the AVCS advance angle amount R to judge if the intake AVCS is operating properly. Response delays during the transition time.	deg
VVT Adv. Ang. Amount L	AVCS advance angle amount for the LH bank on the intake side.	deg
VVT Advance Target Angle Amount L	AVCS target advance angle amount for the LH bank on the intake side. This value is compared with the AVCS advance angle amount L to judge if the intake AVCS is operating	deg

	properly. Response delays during the transition time.	
Exh. VVT Retard Ang. R	AVCS actual retard angle amount for the RH bank on the exhaust side.	deg
Ex VVT Retard Target Angle R	AVCS target retard angle amount for the RH bank on the exhaust side. This value is compared with the exhaust AVCS retard angle amount R to judge if the AVCS is operating properly. Response delays during the transition time.	deg
Exh. VVT Retard Ang. L	AVCS actual retard angle amount for the LH bank on the exhaust side	deg
Ex VVT Retard Target Angle L	AVCS target retard angle amount for the LH bank on the exhaust side. This value is compared with the exhaust AVCS retard angle amount L to judge if the AVCS is operating properly. Response delays during the transition time.	deg
Control module voltage	ECM input power supply voltage.	V
Target Equivalence Ratio	Target air fuel ratio (lambda). It usually becomes 1.0 aiming at a theoretical air fuel ratio.	—
Intake Air Temperature (B1-S1)	Value calculated from the intake air temperature sensor output value of the air flow sensor.	°C or °F
Intake Air Temperature (B1-S2)	Value calculated from the intake air temperature sensor output value of the manifold pressure sensor.	°C or °F
Ambient air temperature	Ambient temperature that ECM estimates by input values from the engine coolant temperature sensor or the intake air temperature sensor etc.	°C or °F
Calculated LOAD Value	Current rate of air amount. Value assuming that the air amount at the current engine speed with the throttle fully open is 100%.	%
Absolute Load Value	Percentage of current intake air amount against the maximum air intake amount of the engine. For non-turbo engine, the value can be close to 95%, but will never be 100%. For turbo engine, this value may exceed 100% due to a boost pressure.	%
Barometric Pressure	Value calculated from atmospheric pressure sensor output value.	kPa, mmHg, inHg or psig
Actual Throttle Opening Angle	Actual throttle opening angle. Calculated by ECM based on the throttle sensor input value.	deg
Commanded Throttle Actuator Control	Control value of the target throttle opening angle calculated by ECM. Shows the target value of opening angle in percentage when 0% means fully closed and 100% means fully open.	%

Relative Throttle Position	Current throttle opening angle in percentage against the throttle voltage (full range) that has reflected the full close point learning value. The value will be approx. 70% at full open.	%
Idle Mass Air Flow	Air volume correction value to maintain the target rotation speed in each water temperature. Corrects air volume when the water temperature changes. It includes values of the feedback correction amount and the learning value.	g/s
Idle Mass Air Flow Feedback correct	Air volume compensation value of ISC as a feedback correction to stabilize the idling speed.	g/s
ISC Learning Value	Learning control value of ISC. After warming up, learning control is executed to reduce the ISC feedback correction to zero, in order to stabilize the engine speed.	g/s
Idle A/C load correct	Air volume correction when the air conditioner is turned on. ECM corrects the air volume against the set target rotation speed when the air conditioner is turned ON.	g/s
Electric Load Feedback Val	Air volume correction value when an electric load is turned on. ECM corrects the air volume against the set target rotation speed when the electric load is turned ON.	g/s
Idle dirty throttle correct	Calculates the ISC learning values on a long-term basis, and judges as an ISC dirty throttle correction when the learning value increases gradually. When carbon or other dirt accumulates on the ISC throttle and make the throttle dirty, air volume decreases when the throttle is fully closed. The ECM increases the amount of compensation air to keep the rotation speed.	g/s
Fuel Rail Pressure A	Fuel pressure sensor output value set to the high pressure fuel line. Output value to ECM.	kPa, mmHg, inHg or psig
Commanded Fuel Rail Pressure A	Target fuel pressure for high pressure fuel line calculated by ECM.	kPa, mmHg, inHg or psig
Fuel Level Input	Fuel level sensor output value. Input value to ECM. Total value of main and sub.	%
Fuel level resistance	Fuel level sensor resistance value. Input value to ECM.	%
Fuel Pump Duty	Fuel pump duty ratio. Supply voltage to the fuel pump is under a duty control by the ECM. This value shows the duty ratio. While the amount of fuel supply is small, such as during idling, the duty value is lowered to decrease the supply voltage.	%

Commanded Evaporative Purge	Evaporative purge rate displayed by the OBD.	%
Purge Density Learn Value	Leaning value of the evaporation gas density purged from the canister. ECM displays the estimated leaning value.	%
Evap Purge Flow	Purge ratio when the evaporation gas is purged from the canister. ECM performs a duty drive to the purge solenoid valve. The amount of gas actually purged will vary depending on the vacuum pressure difference before/after the solenoid valve. Purge ratio displayed here shows current purge amount in percentage against the maximum purge amount when the maximum vacuum pressure is applied.	%
Alternator control mode	Control mode of the electric power generation voltage by the alternator. Low: Mode that controls the battery charge Mid: Mode where the battery is not charged and discharged High: Mode that fixes the voltage when the battery is charged or when an electric load is turned on ExHigh: Mode where the battery is charged during deceleration	—
Battery current value	Battery charge/discharge current value input from the battery sensor. When the value is positive: The current flows to a direction that the battery is charged. When the value is negative: The current flows to a direction that the battery is discharged.	A
Fuel system for Bank 1	Feedback status of air fuel ratio. Open: Feedback is stopped Closed: Feedback control is being performed	—
A/F Sensor #1 Resistance	Value calculated from the front oxygen (A/F) sensor output value.	ohm
Commanded EGR	Target value as EGR setting value calculated by ECM.	%
EGR Error	Percentage of the difference in actual EGR steps as compared to the target EGR steps. Both a positive value and a negative value mean that it doesn't fulfill the target. When the value is positive: It opens more than the target value. When the value is negative: It opens smaller than the target value.	%
Cylinder Monitor #1	Calculates the rotation speed between certain angles on the #1 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the	rpm

	combustion is not ideal in that cylinder.	
Cylinder Monitor #2	Calculates the rotation speed between certain angles on the #2 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	rpm
Cylinder Monitor #3	Calculates the rotation speed between certain angles on the #3 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	rpm
Cylinder Monitor #4	Calculates the rotation speed between certain angles on the #4 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	rpm
Trip Count	Time stamp information. Number of times the ignition is ON since the vehicle was manufactured. The number of ignition ON is also recorded when a trouble code is recorded, so the comparison with that number will show you how many times the ignition has turned on since the diagnostic code was recorded.	Time
Count	Time stamp information. Each unit individually counts the elapsed time since the ignition is turned to ON. Master integrated unit and ECM synchronize with the master time. When synchronized: "Common" When not synchronized: "Originally"	—
Time Count	Time stamp information. Elapsed time after ignition ON. When a trouble code is recorded, the elapsed time after ignition ON is also recorded.	ms
Time Since Engine Start	Elapsed time after starting the engine.	sec
Initial Engine Oil Temp	Oil temperature when starting the engine, which is input to ECM from the oil temperature sensor.	Celsius
Initial Engine Coolant Temp.	Water temperature when starting the engine, which is input to ECM from the water temperature sensor.	Celsius
Initial Intake Air Temp.	Intake air temperature when starting the engine, which is input to ECM from the intake air temperature sensor.	Celsius
Engine Starting Time	Time needed since the cranking started till the judgment of engine start is complete.	ms
IG OFF Elapsed Time	Time the vehicle has been left since the engine stopped. Shows the elapsed time after turning OFF the ignition switch.	sec

Fuel Cut Elapsed Time	Elapsed time after experienced high rotation speed.	sec
Auto Trans Neutral Drive Status	Neutral condition. Information input from the inhibitor switch. (CVT model)	—
X mode	X mode ON or OFF status.	—
SI Drive mode(Display)	SI-DRIVE mode status. ECM output value. Displayed only on models with SI-DRIVE.	—
Stop Light Switch	Stop light switch signal. Set to "ON" when the stop light illuminates. Input value to ECM.	sec
Ignition Switch	Ignition switch signal. Set to "ON" when the ignition switch is ON.	sec
A/C Mid Pressure Switch	Air conditioner middle pressure switch signal. Set to "ON" when the switch is ON. Input value to ECM.	sec
A/C Compressor Signal	A/C compressor drive signal. Set to "ON" when the drive signal is output. ECM output value.	sec
Starter Switch	Starter switch signal. Set to "ON" when the starter is ON. Input value to ECM.	sec
AT turbine speed	Turbine rotation speed of the transmission. Turbine rotation speed is input from the transmission CM via CAN. (CVT model)	—
Lock up status	Lock-up status of the transmission. Lock up status is input from the transmission CM via CAN. (CVT model)	—
P/N Signal	P/N status of the transmission. P/N range status is input from the transmission CM via CAN. (CVT model)	—
O2 Sensor #11	Installation status of the front oxygen (A/F) sensor.	—
O2 Sensor #12	Installation status of the rear oxygen sensor.	—
Short term fuel trim #12	Air fuel ratio correction control value of the rear oxygen sensor.	%
Absolute Throttle Position B	Shows the sub throttle sensor voltage value in % against the full-range 5 V throttle sensor output voltage.	%
Accelerator Pedal Position D	Shows the main accelerator sensor voltage value in % against the full-range 5 V throttle sensor output voltage.	%
Accelerator Pedal Position E	Shows the sub accelerator sensor voltage value in % against the full-range 5 V throttle sensor output voltage.	%
Generic OBDII	Shows the OBD regulation to be followed. This is the information recorded in the ECM, and it does not mean that the unit automatically judges the compliance to the OBD regulations.	—

4. V.I.N REGISTRATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Engine Control System] and select [Enter].
5. On [Select Function] display, select [Work Support].
6. On [Work Support] display, select [Entry VIN].
7. Perform the procedures shown on the display screen.

EyeSight (DIAGNOSTICS) > ACC Cancel Code(s) Display

LIST

ACC Cancel Code(s) Display	Item	Contents of diagnosis
02	ACC Mode:Maintaining Standstill Position	Displayed when the cruise control is cancelled after the own vehicle stops following the preceding vehicle.
04	ACC Mode:Stereo Camera Temporary Stop	During driving in the adaptive cruise mode, this item is displayed when the cruise control is canceled by temporarily stopping the EyeSight.
08	Common:Vehicle Speed Sensor Abnormal	This item is displayed when the cruise control is canceled because of the wheel speed sensor malfunctions.
09	Common: Brake operation	This item is displayed when the cruise control is canceled by the brake operation of the driver.
0A	Common:Pre-Collision Braking	This item is displayed when the cruise control is canceled by the operation of the pre-collision brake.
0B	Common:AT Manual Mode	This item is displayed when the cruise control is canceled because the AT is shifted into manual mode or paddle operation is performed.
0C	Common:VDC SW OFF	This item is displayed when the VDC function is turned off by the VDC OFF switch and the cruise control is canceled.
0D	Common:Any Door is Opened	This item is displayed when the cruise control is canceled by opening the driver's door, passenger's door or rear doors.
0E	Common:Driver Seat Belt Unfastened	This item is displayed when the cruise control is canceled by unfastening the driver's seat belt.
0F	Common:EPB Activation	Displayed when the cruise control is canceled because the EPB is activated.
10	Common:EPB Special Mode	Displayed when the cruise control is canceled by an irregular operation of a driver, which repeats activation/deactivation of the EPB.
12	Common:AT Gear Range	This item is displayed when the following occurs. Since the driver desired to drive the vehicle in the adaptive cruise mode or in the constant speed mode, he or she performed SET or RES operation. However, the operation was not accepted because it was done immediately after D-range shifting.
13	Common:Steep Sloping Road	This item is displayed when the road surface gradient was judged to be steep and the cruise control is canceled.
14	Common:ABS Activation	This item is displayed when the cruise control is canceled by the operation of the ABS.

15	Common:Steering Angle Excessive	This item is displayed when the steering wheel is fully turned and the cruise control is canceled.
16	ACC Mode:Vehicle Stop Judgement	This item is displayed when the cruise control is cancelled after the own vehicle stops followed by the preceding vehicle in the adaptive cruise control mode.
17	Common:Parking Brake Activation	This item is displayed when the cruise control is cancelled by the parking brake application.
18	ACC Mode:Automatic Stop Cancellation	Displayed when the cruise control is cancelled under the following situations: The own vehicle stops following the preceding vehicle while driving in the adaptive cruise control mode, and the driver repeats the SET or RES operation and the automatic brake control continues for 120 seconds.
19	Common:X-Mode	Displayed when the cruise control is canceled because the X mode is activated.
1A	Common:TSM Activation	This item is displayed when the cruise control is cancelled by the operation of TSM commanded by VDC.
1B	Common:VDC Activation	Displayed when the cruise control is canceled because the VDC is activated.
1C	Common:Cancel SW Operation	This item is displayed when the cruise control is canceled by the operation of CANCEL switch.
1D	Common:Cruise SW OFF	This item is displayed when the cruise control is canceled by turning the cruise switch OFF.
1E	CC Mode:Max Speed Exceeded	Displayed when the cruise control is canceled because the own vehicle speed exceeds the controllable range while driving in the constant speed mode.
1F	ACC Mode:Max Speed Exceeded	Displayed when the cruise control is canceled because the own vehicle speed exceeds the controllable range while driving in the adaptive cruise mode.

Note:

- **“Adaptive cruise mode”:** Adaptive cruise control
- **“Constant speed mode”:** Conventional cruise control
- **“Common”:** Adaptive cruise control and conventional cruise control


EyeSight (DIAGNOSTICS) > ACC Cancel Code(s) Display

OPERATION

When the ACC cancel code is detected from the stereo camera, the cruise control will be cancelled.

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [EyeSight], and then select [Enter].
5. On [Select Function] display, select [Cancel Code].
6. On [Cancel Code] display, select [ACC Cancel Code(s) Display].

Note:

- For detailed operation procedures, refer to "Application help".
- Up to eight codes can be stored. When more than eight codes are output, the oldest code will be deleted to store the latest code.
- Stored codes will be cleared by Clear Memory.
- For details on ACC cancel codes, refer to List of ACC cancel code.  [Ref. to EyeSight \(DIAGNOSTICS\)>ACC Cancel Code\(s\) Display>LIST.](#)

EyeSight (DIAGNOSTICS) > Active Lane Keep System Code(s) Display

LIST

Code	Item	Contents of diagnosis
04	Lateral Acceleration is Large	Detected when control output value exceeds the controllable range by a driving operation such as rounding a curve at high speed or making a sharp turn.
0C	Lane Recognition Prohibition(Environmental Factor)	Detected when a driving lane width is narrowed.
18	Out of Control Return Possibility Range	Detected when lane departure prevention control continues for a predetermined time.
26	Real Yaw Rate Excessive	Detected when actual yaw rate exceeds the maximum value of target yaw rate by a specified amount.
37	Yaw Rate Sensor Abnormal(Control)	Detected when the difference between actual yaw rate and expected yaw rate becomes the specified value or more.
50	Camera Adjustment Abnormal 1	Detected when the accuracy of camera learning values is not sufficient. Usually detected after replacing the camera and performing an aiming, and resolved by an automatic adjustment while driving.
52	Yaw Rate Sensor Abnormal(Recognition)	Detected when the vehicle weaves all over the road or when the camera condition is not good and therefore white lines are not correctly recognized.

EyeSight (DIAGNOSTICS) > Active Lane Keep System Code(s) Display

OPERATION

Lane Departure Prevention Deactivate Code(s) Display: The lane departure prevention deactivate code is output, when the lane keep (lane departure prevention) is canceled during the operation or the standby state is canceled.

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [EyeSight], and then select [Enter].
5. On [Select Function] display, select [Cancel Code].
6. On [Cancel Code] display, select [Lane Departure Prevention Assist Deactivate Code(s) Display].


Note:

- For detailed operation procedures, refer to "Application help".
- Up to eight codes can be stored. When more than eight codes are output, the oldest code will be deleted to store the latest code.
- Stored codes will be cleared by Clear Memory.
- For details on lane keep assist codes, refer to List of lane keep assist code.


 [Ref. to EyeSight \(DIAGNOSTICS\)>Active Lane Keep System Code\(s\) Display>OPERATION.](#)

PROCEDURE

Caution:

- Start the diagnosis after the engine has started. (Cruise control main switch does not turn on even if it is pressed before the engine starts.)
- When performing diagnosis, observe the legal speed limit on the road.
- ECM cancel code, ACC cancel code and lane keep assist code are not the diagnostic trouble codes (DTCs). These codes will also appear when the cruise control or the active lane keep is cancelled by the driver's operation. Do not confuse them.
- Be sure to get an assistant to support the diagnosis while driving, and have him/her operate the select monitor.
- Be sure to record the following data before performing the Clear Memory. (Data must be obtained before inspection because the Clear Memory operation deletes previous faults and temporary stop history.)
 - All Diagnostic Trouble Codes (DTCs)
 - DTC of stereo camera (current malfunction, past malfunction)
 - Freeze frame data of stereo camera
 - ACC cancel code of stereo camera
 - Lane keep assist code of stereo camera
 - EyeSight temporary stop code of stereo camera
 - Data monitor of stereo camera(To obtain the data concerning camera adjustment information, previous trouble or temporary stop history, all data must be measured for two – three seconds after the engine has started.)
- When a temporary stop occurs, stereo camera may be affected by a small amount of dirt that would not be perceived by the driver. In this case, cleaning the windshield glass is effective.  [Ref. to EyeSight \(DIAGNOSTICS\)>General Description>INSPECTION > WINDSHIELD GLASS AND DASHBOARD.](#)

1. PREPARATION BEFORE INSPECTION. 

Using the Check List for Interview, confirm the condition of the malfunction occurrence from the user.  [Ref. to EyeSight \(DIAGNOSTICS\)>Check List for Interview>CHECK.](#)

Is there any component that obviously seems to affect the malfunction?


Yes

Repair or replace the component that seems to affect the malfunction.


No

 [Go to 2.](#)

2. CHECK DTC. 



Read the DTC using Subaru Select Monitor.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Code\(s\)_Display.](#)

Note:

When communication with the stereo camera could not be established, check the circuit.  [Ref. to EyeSight \(DIAGNOSTICS\)>Subaru Select Monitor>INSPECTION.](#)

Are any DTCs displayed?


Yes

Perform the diagnosis according to DTC and freeze frame data. If the diagnostic codes other than the stereo camera are displayed, refer to the diagnosis for the relevant codes.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Code\(s\)_Display.](#)  [Ref. to EyeSight \(DIAGNOSTICS\)>Freeze Frame Data Display.](#)

No

 [Go to 3.](#)

3. PERFORM DIAGNOSTICS WITH PHENOMENON.

Using the diagnostics with phenomenon, perform inspection.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostics with Phenomenon.](#)

Can you see that no phenomenon described in the diagnostics with phenomenon occur?
Can you see that no indicators show sign of malfunction?

Yes

Finish the diagnosis.

No

Perform the diagnosis according to the diagnostics with phenomenon.

EyeSight (DIAGNOSTICS) > Check List for Interview

CHECK

Inspect the following items regarding the vehicle's state.



Writer/Inspector	Writer's name		
	Inspector's Name		
Vehicle information	Car accessory equipment condition	Car accessory is installed to the windshield glass.	No/Yes (Position: _____)
		Other	No/Yes (Accessory's name: _____)
	Is there any modification for the following items?	Suspension?	Not changed/Changed (Describe concretely: _____)
		Headlight?	Not changed/Changed (Describe concretely: _____)
		Tire size?	Not changed/Changed (Describe concretely: _____)
		Front wiper?	Not changed/Changed (Describe concretely: _____)
	How is the condition around camera?	Is there any scratch or damage on the windshield glass?	No/Yes (Describe concretely: _____)
		Are antennas, etc. attached on the prohibited area?	No/Yes (Describe concretely: _____)
		Is wide mirror or accessory attached?	No/Yes (Describe concretely: _____)
	How is the surface condition of the windshield glass?	Presence of oil film, fogging, dirt and/or glass coating	No/Yes (Describe concretely: _____)
	How is the condition of the dashboard?	Is there anything that can be easily reflected against the windshield glass on the dashboard?	No/Yes (Describe concretely: _____)
	How is the deterioration of the	Does any streak or uneven wiping area remain in front of the camera?	No/Yes

	wiper?		(Describe concretely:)	
	How is the condition of the tire?	Is there any wear?	No/Yes	
		Is there any excessive wear difference?	(Describe concretely:)	
		Is the air pressure proper?	Proper/Improper (Describe concretely:)	
	How is the condition of the camera lens filter?	Is there finger print adhesion or cracks on the lens filter?	No/Yes (Describe concretely:)	
Description of malfunction	What kind of malfunction has been detected?	Failure/temporary stop/faulty operation of adaptive cruise control/faulty operation of pre-collision brake/other faulty operations		
	What kind of DTC and/or cancel code is displayed?			
	How is the meter display?	EyeSight warning light	Off/On/Blink	
		Pre-collision brake OFF indicator light	Off/On	
		Lane departure warning OFF indicator light	Off/On	
Multi-information display		<ul style="list-style-type: none"> • Halt: camera view defectiveness • Halt: camera temperature range outside • Halt 		
Occurrence conditions	Occurrence date		Occurrence location	
	Vehicle speed at occurrence	Approximately mile	Occurrence timing	During driving/during stopping/continues after engine has started
	Road type	Express way/limited highway/main highway/general road	Weather	Fine/cloudy/rainy/snowy/other
	Road condition ①	Dry/slippery (rainy • compacted snow • icy road)	Ambient air temperature	Approximately °C (° F)
	Road condition ②	Asphalt/gravel/earth and sand/other	Position of solar radiation	Described in the detailed chart when the weather is fine.

Road shape	Uphill/downhill/bank/roll/uneven surface	Time elapsed after engine start	Immediately after engine start/within 5 minutes after engine start/more than 5 minutes after engine start
Wiper operation status	OFF/INT/LO/HI/AUTO	Light on status	Off/LO On/HI On
Curb weight	Number of passengers: (), Did the vehicle carry heavy load? (No/Yes (Approx. kg))		

Detailed chart
(Refer to the example of description.)

In case of malfunction caused by temporary stop or faulty operation, describe the details by referring to the example below so that the following conditions can be recognized. (Images taken with a digital camera, etc. are acceptable.)

- Road shape (straight, curve, tunnel, number of lane, etc.)
- Road grade and it's change
- Presence of white line, guardrails and/or side wall (degree of clarity)
- Position of the sun
- Presence and shape of preceding vehicle, oncoming vehicle, vehicle running on the next lane or pedestrian

- Presence and shape of surrounding building or structure
- Traveled course of own vehicle and preceding vehicle



EXAMPLE OF WRITING

A-A

Rain water collected in vicinity of center line

Sun altitude: Low

Sun direction: Front left

B-B

Preceding-vehicle: Wagon type
Passed side of parked vehicle

B

Vehicle parked at road side: Light truck

Malfunction recognition (Cruise control cancel)

Preceding-vehicle descending from top of hills

A

A

On coming vehicle: Not so many

Approaching to gentle uphill

Straight road, two way traffic with single lane

During cruise control driving, vehicle has been passing over parked vehicle in the same way as preceding-vehicle

White line on left appears double because of old line

White line on right is vague in sometimes

B

EyeSight (DIAGNOSTICS) > Clear Active Lane Keep System Learning Value

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [EyeSight], and then select [Enter].
5. On [Select Function] display, select [Work Support].
6. On [Work Support] display, select [Clear Active Lane Keep System Learning Value].

Note:

- **When suspension parts are replaced or wheel alignment is adjusted, perform [Clear Active Lane Keep System Learning Value].**
- **For detailed operation procedures, refer to "Application help".**

EyeSight (DIAGNOSTICS) > Clear memory

OPERATION

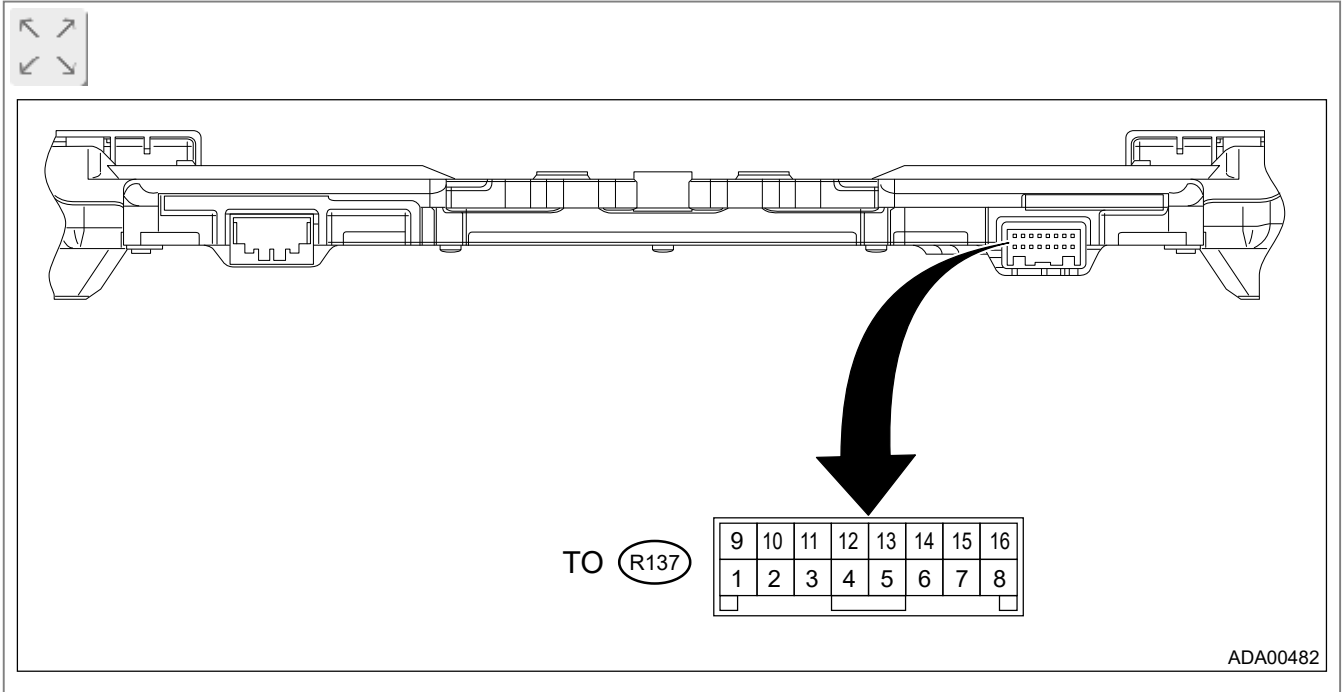
1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [EyeSight], and then select [Enter].
5. On [Select Function] display, select [DTC].
6. On [DTC] display, select [Clear memory].

Note:

For detailed operation procedures, refer to “Application help”.

ELECTRICAL SPECIFICATION



1. STEREO CAMERA



Terminal No.	Description	Measuring condition	Standard
(R137) No. 1	Local CAN-H (RAB communication line)	—	—
(R137) No. 2	Local CAN-L (RAB communication line)	—	—
(R137) No. 3	—	—	—
(R137) No. 4	—	—	—
(R137) No. 5	—	—	—
(R137) No. 6 ↔ Chassis ground	Ignition power supply	Ignition switch OFF → ON	Less than 1 V → 9 — 16 V
(R137) No. 7 ↔ Chassis ground	GND	Always	Less than 1 Ω
(R137) No. 8 ↔ Chassis ground	Battery power supply	Always	9 — 16 V
(R137) No. 9 ↔ Chassis ground	CAN L	Always	1 kΩ or more
(R137) No. 10 ↔ Chassis ground	CAN H	Always	1 kΩ or more
(R137) No. 11	—	—	—
(R137) No. 12 ↔ Chassis ground	Pre-collision brake OFF switch input	Pre-collision brake OFF switch OFF → ON	Approx. 1 kΩ → less than 1 Ω

(R137) No. 13 ↔ Chassis ground	Lane departure warning OFF switch input	Lane departure warning OFF switch OFF → ON	Approx. 1 kΩ → less than 1 Ω
(R137) No. 14 ↔ (R137) No. 15	EyeSight steering switch input	ALL OFF (no switch operation)	2.6 V – 5.0 V
		ALL OFF → RES/+ ON	2.6 V – 5.0 V
		ALL OFF → Following distance ON	0.0 V – 2.5 V
		ALL OFF → SET/– ON	2.6 V – 5.0 V
		ALL OFF → CRUISE ON	2.6 V – 5.0 V
		ALL OFF → lane keep switch ON	2.6 V – 5.0 V
(R137) No. 15 ↔ Chassis ground	EyeSight steering switch GND	Always	Less than 1 Ω
(R137) No. 16 ↔ (R137) No. 15	EyeSight steering switch input	ALL OFF (no switch operation)	3.6 V – 4.5 V
		ALL OFF → RES/+ ON	2.6 V – 3.5 V
		ALL OFF → Following distance ON	3.6 V – 4.5 V
		ALL OFF → SET/– ON	0.6 V – 1.5 V
		ALL OFF → CRUISE ON	0.0 V – 0.5 V
		ALL OFF → lane keep switch ON	1.6 V – 2.5 V


2. ENGINE CONTROL MODULE (ECM)

For details on the input/output signals for the engine control module, refer to ENGINE (DIAGNOSTICS).  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Engine Control Module \(ECM\) I/O Signal.](#)  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Engine Control Module \(ECM\) I/O Signal.](#)

3. VDC CONTROL MODULE (VDCCM)

For details on the input/output signals for VDC control module, refer to BRAKE CONTROL (DIAGNOSTICS).  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Control Module I/O Signal.](#)

4. TRANSMISSION CONTROL MODULE (TCM)

For details on the input/output signals for the transmission control module, refer to TRANSMISSION (DIAGNOSTICS).  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Transmission Control Module \(TCM\) I/O Signal.](#)

5. BODY INTEGRATED UNIT

Refer to the BODY CONTROL SYSTEM (DIAGNOSTICS) for the I/O Signal of the body integrated unit.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Control Module I/O Signal.](#)

6. COMBINATION METER

For details on the input/output signals for the combination meter, refer to COMBINATION METER (DIAGNOSTICS).  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Control Module I/O Signal.](#)

7. MFD

For details on the input/output signals for MFD, refer to MULTI-FUNCTION DISPLAY (DIAGNOSTICS).

 [Ref. to MULTI-FUNCTION DISPLAY\(DIAGNOSTICS\)>Control Module I/O Signal.](#)

8. RAB CM

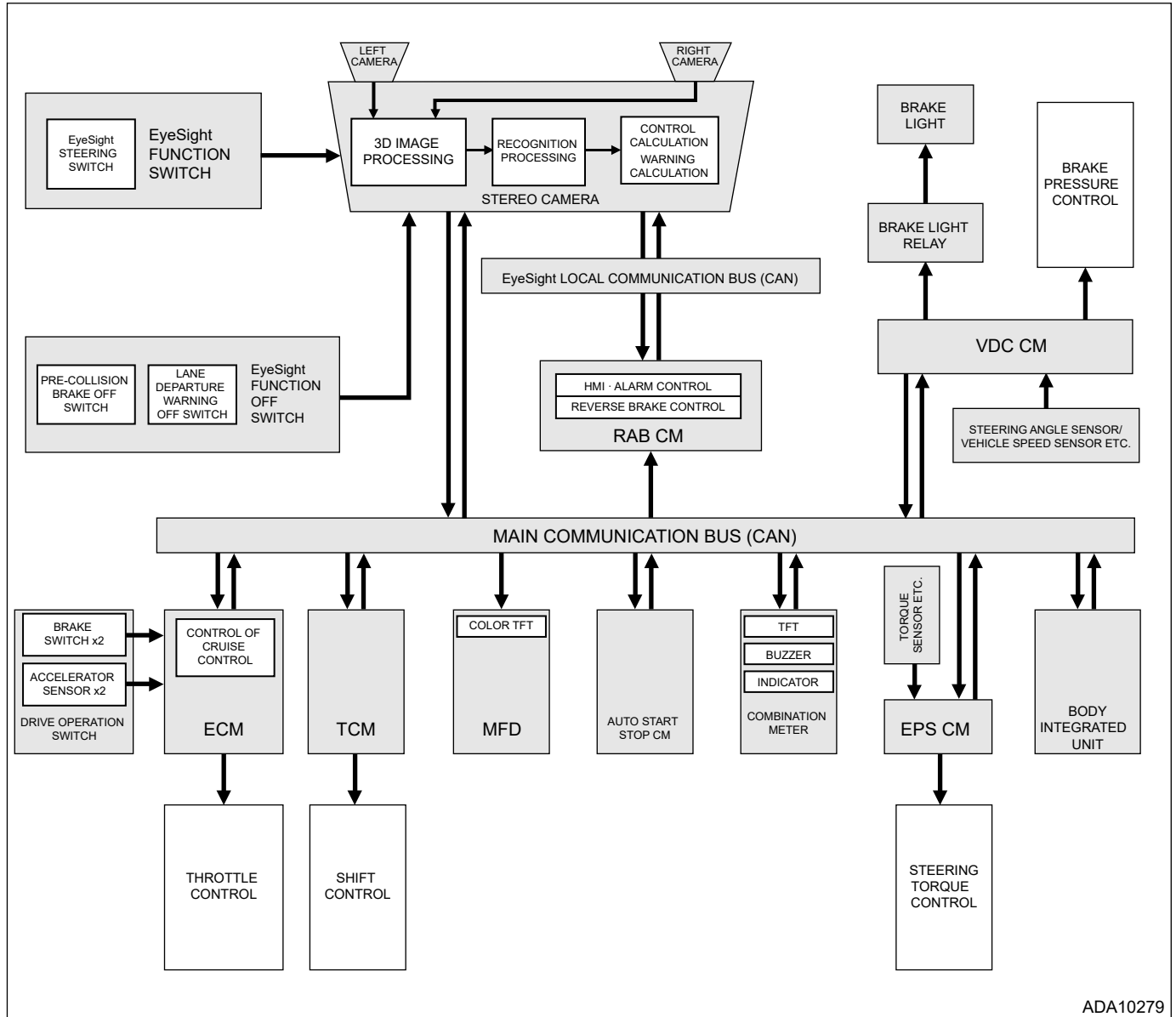
For the input/output signals for the RAB CM, refer to Reverse Automatic Braking (DIAGNOSTICS).

 [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Control Module I/O Signal.](#)

EyeSight (DIAGNOSTICS) > Control Module I/O Signal

SYSTEM BLOCK DIAGRAM

Main signals used between stereo camera and relevant CM



EyeSight (DIAGNOSTICS) > Control Module I/O Signal

WIRING DIAGRAM


Refer to "EyeSight System" in the wiring diagram.  [Ref. to WIRING SYSTEM>EyeSight System.](#)

LIST

1. STEREO CAMERA

Display	Description	Unit of measure	Note
Camera ID	Display of serial No. inside the stereo camera	—	—
Control Software Version	Control software version	—	—
Recognition software version	Recognition software version	—	—
Model registration information	Display of displacement and vehicle model	—	—
ECU Power Supply Voltage (IG)	Display of input voltage of stereo camera	V	—
Initial Aiming Completion Status	Initial aiming completion flag	—	Exit (After factory shipping, when stereo camera is replaced or adjusted, "Not Finish")
Aiming Completion Status	Aiming completion flag	—	Not Finish (After factory shipping, when stereo camera is replaced or adjusted, "Exit")
Trip Count	Total count of ignition switch ON	Time	—
Trip Meter	Odometer value	<ul style="list-style-type: none"> • km • mile 	—
Front axle mean wheel speed	Front axle average wheel speed	km/h	—
Engine Speed	Engine speed	rpm	—
Accel. Opening Angle	Acceleration opening angle signal	%	—
ETC Throttle angle signal	Electronic throttle control opening angle signal	%	—
+Steering Angle Sensor Value (Right +) (Left -)	Steering angle sensor value signal	deg	—
+Longitudinal G Sensor Value	Longitudinal acceleration	m/s ²	—

(Deceleration +) (Acceleration -)			
Brake Fluid Target Pressure	Target value of brake fluid pressure	MPa	—
Master Cylinder Actual Fluid Pressure	Brake pressure	MPa	—
Right Front Wheel W/C Actual Fluid Pressure	Right front wheel cylinder fluid pressure	MPa	—
Left Front Wheel W/C Actual Fluid Pressure	Left front wheel cylinder fluid pressure	MPa	—
Target torque	Target torque command signal	Nm	—
Engine Torque	Actual engine shaft torque value	Nm	—
AT rapid start prevention, engine torque down command value	AT rapid start prevention control, engine torque down command value, or AT false start (reverse) prevention control, engine torque down command value	Nm	—
Warning code	Warning code signal	—	<ul style="list-style-type: none"> • No alarm • HALT • Brake More or Following Distance or Pre-Collision Brake(1st) • ACC Cancel • Pre-Collision Brake (2nd Braking) • LDW/Privent • Lane Sway Warning • L_Keep Cancel • Detection/Lost of Vehicle Beep • Lead Vehicle Start Alert • Steering Wheel Not Held • Pre-Collision Throttle Management
Brake SW Input	Brake switch signal status	—	<ul style="list-style-type: none"> • OFF • ON
Brake Lamp SW	Brake light switch signal status	—	<ul style="list-style-type: none"> • OFF

(BIU)			<ul style="list-style-type: none"> • ON
Brake Lamp SW (VDC)	Brake light switch status	—	<ul style="list-style-type: none"> • OFF • ON
Current gear position	Current gear position signal	—	<ul style="list-style-type: none"> • P • R • Auto Neutral • 6 • 5 • 4 • 3 • 2 • 1 • N
SI Drive mode	SI-DRIVE mode (Display)	—	<ul style="list-style-type: none"> • Light Off • S# • I • S
Trip Count [count]	Number of ignition ON	Time	—
Count	Original counts identification information	—	—
Time Count [msec]	Elapsed time after ignition switch is turned to ON	ms	—
Automatic adjustment status	Automatic adjustment status	—	—
Lane recognition status	Display of lane recognition status	—	<ul style="list-style-type: none"> • Other than following: 00 • Recognizing traffic lanes on both sides at 40 km/h (25 MPH) or more: 03 • Recognizing traffic lanes on both sides at 65 km/h (40 MPH) or more (ALK recognition standby): 05
Preceding vehicle distance	Display of distance from preceding vehicle	m	—
EyeSight Temporary 0 Count	Occurrence count of EyeSight temporary stop 0	Time	Refer to the LIST OF CONTENTS FOR CAMERA TEMPORARY STOP.
EyeSight Temporary 1 Count	Occurrence count of EyeSight temporary stop 1	Time	
EyeSight Temporary 2 Count	Occurrence count of EyeSight temporary stop 2	Time	
			 Ref. to EyeSight (DIAGNOSTICS)>EyeSight Temporary

EyeSight Temporary 3 Count	Occurrence count of EyeSight temporary stop 3	Time
EyeSight Temporary 4 Count	Occurrence count of EyeSight temporary stop 4	Time
EyeSight Temporary 5 Count	Occurrence count of EyeSight temporary stop 5	Time
EyeSight Temporary 6 Count	Occurrence count of EyeSight temporary stop 6	Time
EyeSight Temporary 7 Count	Occurrence count of EyeSight temporary stop 7	Time
EyeSight Temporary 8 Count	Occurrence count of EyeSight temporary stop 8	Time
EyeSight Temporary 9 Count	Occurrence count of EyeSight temporary stop 9	Time
EyeSight Temporary 10 Count	Occurrence count of EyeSight temporary stop 10	Time
EyeSight Temporary 11 Count	Occurrence count of EyeSight temporary stop 11	Time
EyeSight Temporary 12 Count	Occurrence count of EyeSight temporary stop 12	Time
EyeSight Temporary 13 Count	Occurrence count of EyeSight temporary stop 13	Time
EyeSight Temporary 14 Count	Occurrence count of EyeSight temporary stop 14	Time
EyeSight Temporary 15 Count	Occurrence count of EyeSight temporary stop 15	Time
EyeSight Temporary 16 Count	Occurrence count of EyeSight temporary stop 16	Time
EyeSight Temporary 17 Count	Occurrence count of EyeSight temporary stop 17	Time
EyeSight Temporary 18 Count	Occurrence count of EyeSight temporary stop 18	Time
EyeSight Temporary 19 Count	Occurrence count of EyeSight temporary stop 19	Time
EyeSight Temporary 20 Count	Occurrence count of EyeSight temporary stop 20	Time
EyeSight Temporary 21 Count	Occurrence count of EyeSight temporary stop 21	Time
EyeSight Temporary 22 Count	Occurrence count of EyeSight temporary stop 22	Time
EyeSight Temporary 23 Count	Occurrence count of EyeSight temporary stop 23	Time
EyeSight Temporary 24 Count	Occurrence count of EyeSight temporary stop 24	Time

[Code\(s\).](#)
[Display>LIST >](#)
[LIST OF CONTENTS](#)
[FOR CAMERA](#)
[TEMPORARY STOP.](#)

EyeSight Temporary 25 Count	Occurrence count of EyeSight temporary stop 25	Time	
EyeSight Temporary 26 Count	Occurrence count of EyeSight temporary stop 26	Time	
EyeSight Temporary 27 Count	Occurrence count of EyeSight temporary stop 27	Time	
EyeSight Temporary 28 Count	Occurrence count of EyeSight temporary stop 28	Time	
EyeSight Temporary 29 Count	Occurrence count of EyeSight temporary stop 29	Time	
EyeSight Temporary 30 Count	Occurrence count of EyeSight temporary stop 30	Time	
EyeSight Temporary 31 Count	Occurrence count of EyeSight temporary stop 31	Time	
Camera Failure Check 1	Camera failure supplementary information	—	—
Camera Failure Check 2			
Camera Failure Check 3			
Camera Failure Check 4			
Camera Failure Check 5			
→Cruise Control Main Status (ECM→EyeSight)	Status of the cruise control main switch (cruise switch)	—	<ul style="list-style-type: none"> • OFF • ON
→Main Cruise Control Display (EyeSight→Combination Meter)	CRUISE indicator ON signal	—	<ul style="list-style-type: none"> • Light Off • Light On
→Cruise Control Main Display (ECM→EyeSight)	CRUISE indicator ON request signal	—	<ul style="list-style-type: none"> • Light Off • Light On
→Cruise Control SW (EyeSight→ECM)	EyeSight steering switch information	—	<ul style="list-style-type: none"> • OFF • Main ON • SET/- (Shallow) ON • RES/+ (Shallow) ON • Open
Cruise Control SW Voltage (Port14)	Cruise control switch input voltage value on Port 14	V	Normal range of the voltage value when each switch is operated

			<ul style="list-style-type: none"> • When operating nothing (all switch operation OFF) (2.6—5.0) • When CRUISE is ON (2.6—5.0) • When lane keep is ON (2.6—5.0) • When SET/– is ON (2.6—5.0) • When following distance is ON (0.0—2.5) • When RES/+ is ON (2.6—5.0)
Cruise Control SW Voltage (Port16)	Cruise control switch input voltage value on Port 16	V	<p>Normal range of the voltage value when each switch is operated</p> <ul style="list-style-type: none"> • When operating nothing (all switch operation OFF) (3.6—4.5) • When CRUISE is ON (0.0—0.5) • When lane keep is ON (1.6—2.5) • When SET/– is ON (0.6—1.5) • When following distance is ON (3.6—4.5) • When RES/+ is ON (2.6—3.5)
→Cruise Control Set Status (ECM→EyeSight)	Status of the cruise control set status	—	<ul style="list-style-type: none"> • Release • Set
→Cruise Control Set Display (EyeSight→Combination Meter)	SET indicator illumination signal	—	<ul style="list-style-type: none"> • Light Off • Light On
→Cruise Control Set Display (ECM→EyeSight)	Request signal for SET indicator illumination	—	<ul style="list-style-type: none"> • Light Off • Light On
Cruise Control Mode	Cruise control mode signal	—	<ul style="list-style-type: none"> • ACC Mode • CC Mode

Pre-Collision Brake OFF Display Signal	Pre-collision brake OFF indicator light illumination command signal	—	<ul style="list-style-type: none"> • OFF • ON
Pre-Collision Brake OFF SW	Pre-collision brake OFF switch status	—	<ul style="list-style-type: none"> • OFF • ON • Open Load
Pre-crash brake function	ON/OFF status of pre-collision brake function	—	<ul style="list-style-type: none"> • OFF • ON
Lane Departure Warning Display Signal	Lane departure warning OFF indicator light illumination command signal	—	<ul style="list-style-type: none"> • OFF • ON
Lane Departure Warning Function	ON/OFF status of the lane departure warning function	—	<ul style="list-style-type: none"> • OFF • ON
Lane Departure Warning OFF SW	Lane departure warning OFF switch status	—	<ul style="list-style-type: none"> • OFF • ON • Open Load
Vehicle Speed Set Display	Cruise control set vehicle speed set value	<ul style="list-style-type: none"> • km/h • MPH 	—
Cruise Control Set Speed	Set vehicle speed value for cruise control	<ul style="list-style-type: none"> • km/h • MPH 	—
Drive Wheel Average Speed	Wheel speed average speed signal	km/h	—
Front left wheel speed	Front left wheel speed signal	km/h	—
Front right wheel speed	Front right wheel speed signal	km/h	—
Rear left wheel speed	Rear left wheel speed signal	km/h	—
Rear right wheel speed	Rear right wheel speed signal	km/h	—
Wheel Speed (Pulse)	Wheel speed pulse counter signal	—	—
CVT Target Revolution Speed Control Signal	CVT target revolution speed command signal	—	<ul style="list-style-type: none"> • No • Pre-Collision BA Operation
CVT Target Revolution Speed Value	CVT target revolution speed	rpm	—
Turbine Revolution Speed	AT turbine speed signal	rpm	—
Driver Torque Request	Torque value requested by driver	Nm	—
Accelerator wide opening judgment status	Signal that judges the accelerator opening angle to be "wide".	—	<ul style="list-style-type: none"> • Not established • Established

Intake Manifold Pressure Absolute	Engine intake manifold pressure	mmHg	—
Gear Ratio Actual	Current total reduction ratio signal	—	—
Barometric Pressure	Atmospheric pressure signal	mmHg	—
Adaptive Cruise Control Brake Control Status	Brake control permission signal for adaptive cruise control	—	<ul style="list-style-type: none"> • OFF • ON
Adaptive Cruise Control Braking Signal	Actuation signal of brake control	—	<ul style="list-style-type: none"> • Not performed • Perform
Adaptive Cruise Control Braking (ACC or Driver) Status (for CVT)	Adaptive cruise control braking (driver or control) signal (for CVT)	—	<ul style="list-style-type: none"> • Brakes non-enforcement • Braking applied
Brake Lamp Command	Brake lamp light up command signal	—	<ul style="list-style-type: none"> • No • Pre-Collision BA Operation
Hill Down Mode	Hill down mode signal	—	<ul style="list-style-type: none"> • Releasing • Going Down Grade
HOLD Display	HOLD display illumination signal (stop and hold)	—	<ul style="list-style-type: none"> • Light Off • Light On
READY Display	READY indicator illumination signal	—	<ul style="list-style-type: none"> • Light Off • Light On
Vehicle Distance Setting Display	Vehicle distance setting indicator signal	—	<ul style="list-style-type: none"> • Follow Far Distance • Follow Medium Distance • Follow Close Distance • CC Conventional Cruise Control
Preceding vehicle indication	Preceding vehicle indicator signal	—	<ul style="list-style-type: none"> • Light Off • Light On • Blink
Preceding vehicle distance	Preceding vehicle distance signal	m	<ul style="list-style-type: none"> • $0 \leq x < 5$ • $5 \leq x < 10$ • $10 \leq x < 15$ • $15 \leq x < 20$ • $20 \leq x < 25$ • $25 \leq x < 30$ • $30 \leq x < 35$ • $35 \leq x < 40$ • $40 \leq x < 45$

			<ul style="list-style-type: none"> • $45 \leq x < 50$ • $50 \leq x < 55$ • $55 \leq x < 60$ • $60 \leq x < 65$ • $65 \leq x < 70$ • $70 \leq x < 75$ • $75 \leq x$
Adaptive Cruise Control OFF Display	OFF indicator signal	—	<ul style="list-style-type: none"> • Light Off • Light On • Blink
Adaptive Cruise Control Stop Hold Status	Stop hold, before reserve signal	—	<ul style="list-style-type: none"> • OFF • Stop is held
EPB Hill Hold Prohibited	Hill hold prohibition signal	—	<ul style="list-style-type: none"> • ON • OFF
Idle SW for EPB Control	Idle switch signal for electronic parking brake control	—	<ul style="list-style-type: none"> • OFF • ON
Fuel Cut Control Status	Fuel cut control permission signal	—	<ul style="list-style-type: none"> • ON • OFF
All Cylinder Fuel Cut Status	Fuel cut signal	—	<ul style="list-style-type: none"> • Normal • Cut
Low Speed Following	Low speed following mode signal	—	<ul style="list-style-type: none"> • No • Yes
Display for Adaptive Cruise Control Cancel Reason	Display for adaptive cruise control cancel reason	—	<ul style="list-style-type: none"> • No Manual Mode or No D Position • Door Open • Driver's Seatbelt is Unfastened • Parking Brake Operation • VDC SW OFF • Steering Operation • High Speed • ABS operation • VDC Activity (Stability Control) • Road Surface Steep Slope • Others
Adaptive cruise control compulsory cancellation	Adaptive cruise control forced cancel signal	—	<ul style="list-style-type: none"> • No • Yes
EyeSight Deceleration	Deceleration request reception status signal from stereo camera	—	<ul style="list-style-type: none"> • Not yet received • Reception

Request (VDC)			
Parking Brake Signal	Parking brake switch signal status	—	<ul style="list-style-type: none"> • OFF • ON
Driver Brake Detection	Driver brake detection signal	—	<ul style="list-style-type: none"> • OFF • ON
Driver Door Status	Driver's door switch signal status	—	<ul style="list-style-type: none"> • Close • Open
Passenger Door Front Status	Passenger's door switch signal status	—	<ul style="list-style-type: none"> • Close • Open
Right Rear Door Status	Right rear door switch signal status	—	<ul style="list-style-type: none"> • Close • Open
Left Rear Door Status	Left rear door switch signal status	—	<ul style="list-style-type: none"> • Close • Open
Driver's seat belt status	Status of driver's seat belt	—	<ul style="list-style-type: none"> • ON • ON
VDC Over Steer Control	Operating status signal 1 of VDC	—	<ul style="list-style-type: none"> • Not during control • During control
VDC Under Steer Control	Operating status signal 2 of VDC	—	<ul style="list-style-type: none"> • Not during control • During control
ABS operation	Operating status signal of ABS	—	<ul style="list-style-type: none"> • Not Operate • Operate
TCS Operating Condition	Operating status signal of TCS	—	<ul style="list-style-type: none"> • Not Operate • Operate
RMI Operation	RMI operation signal	—	<ul style="list-style-type: none"> • Not during control • During control
Brake control actuate	Brake operation permission signal	—	<ul style="list-style-type: none"> • Not performed • Perform
Ignition SW ON Count When Pre-Collision Throttle Management at The Latest	Ignition switch ON count when AT false start prevention control is activated (the latest)	Time	—
Ignition SW ON Count When Pre-Collision Throttle Management at The 1 Time before	Ignition switch ON count when AT false start prevention control is activated (1 time before)	Time	—
Ignition SW ON Count When Pre-Collision Throttle Management at The 2 Time before	Ignition switch ON count when AT false start prevention control is activated (2 time before)	Time	—

Ignition SW ON Count When Following Distance Warning at The Latest	Ignition switch ON count when the vehicle distance alarm is activated (the latest)	Time	—
Ignition SW ON Count When Following Distance Warning at The 1 Time before	Ignition switch ON count when the vehicle distance alarm is activated (1 time before)	Time	—
Ignition SW ON Count When Following Distance Warning at The 2 Time before	Ignition switch ON count when the vehicle distance alarm is activated (2 time before)	Time	—
Ignition SW ON Count When Pre-Collision 1st Braking at The Latest	Ignition switch ON count when the pre-collision 1st braking is operated (at the latest)	Time	—
Ignition SW ON Count When Pre-Collision 1st Braking at The 1 Time before	Ignition switch ON count when the pre-collision 1st braking is operated (1 time before)	Time	—
Ignition SW ON Count When Pre-Collision 1st Braking at The 2 Time before	Ignition switch ON count when the pre-collision 1st braking is operated (2 times before)	Time	—
Ignition SW ON Count When Pre-Collision 1st Braking at The 3 Time before	Ignition switch ON count when the pre-collision 1st braking is operated (3 times before)	Time	—
Ignition SW ON Count When Pre-Collision 2nd Braking at The Latest	Ignition switch ON count when the pre-collision 2nd braking is operated (at the latest)	Time	—
Ignition SW ON Count When Pre-Collision 2nd Braking at The 1 Time before	Ignition switch ON count when the pre-collision 2nd braking is operated (1 time before)	Time	—
Ignition SW ON	Ignition switch ON count when the pre-	Time	—

Count When Pre-Collision 2nd Braking at The 2 Time before	collision 2nd braking is operated (2 time before)		
Ignition SW ON Count When Pre-Collision 2nd Braking at The 3 Time before	Ignition switch ON count when the pre-collision 2nd braking is operated (3 time before)	Time	—
Pre-Collision Brake Assist Operation	Pre-collision brake assist request reception status	—	<ul style="list-style-type: none"> • Not Operate • Operate
Pre-Collision Brake Action	Pre-collision brake command signal	—	<ul style="list-style-type: none"> • No • Pre-Collision BA Operation
Pre-crash brake operation	Pre-collision brake operation status	—	<ul style="list-style-type: none"> • Not Operate • Operate
Pre-Collision Brake Assist Threshold	Pre-collision brake threshold	—	<ul style="list-style-type: none"> • Normal • Threshold 1 • Threshold 2 • No request
Rear Wheel Slip Control Operation	Rear wheel slip detection signal	—	<ul style="list-style-type: none"> • Not operating • ON
EyeSight Initialization(RAB)	Signal notifying the sonar of whether the EyeSight has already started	—	<ul style="list-style-type: none"> • Undefined • Completed
RAB Function Setting Existence	Reverse Automatic Braking function, presence/absence information of the sonar alarm function (RAB → EyeSight)	—	<ul style="list-style-type: none"> • EPB not Setup • Setting
→RAB Fail Indication(EyeSight →RAB)	RAB function stop command information to sonar due to EyeSight failure	—	<ul style="list-style-type: none"> • No Indication • Indication
→RAB Sonar System Failure(RAB→EyeSight)	Reverse Automatic Braking function, failure status of the sonar alarm function (RAB → EyeSight)	—	<ul style="list-style-type: none"> • Normal • Sonar Failure • System Failure • Undefined
→RAB OFF Indication(EyeSight →RAB)	Reverse Automatic Braking function forced stop signal to sonar due to an EyeSight temporary stop etc.	—	<ul style="list-style-type: none"> • RAB ON • RAB Force OFF
Recession Control Permission(RAB)	Information of whether the Reverse Automatic Braking control is executable or not	—	<ul style="list-style-type: none"> • Prohibition • Permit
→RAB Acceleration Suppression Control State(EyeSight→RAB)	Acceleration suppression control status of EyeSight by the command from sonar	—	<ul style="list-style-type: none"> • No Control • Precom • Recruitment
→RAB Brake Control	Brake control status of EyeSight by the command from sonar	—	<ul style="list-style-type: none"> • No Control • Precompression

State(EyeSight→RAB)			<ul style="list-style-type: none"> • Brake Control In • Stopped and Held • Gradual Decrease
RAB Setting Information	Reverse Automatic Braking function, presence/absence information of the sonar alarm function (EyeSight → RAB)	—	<ul style="list-style-type: none"> • OFF • ON
Sonar System Image Display(RAB)	Sonar system display hide status notification for MFD	—	<ul style="list-style-type: none"> • Display • Not Display
RAB Function OFF Information	Reverse Automatic Braking function OFF status	—	<ul style="list-style-type: none"> • ON • OFF
Audible Alarm function OFF Information(RAB)	Sonar alarm function OFF status	—	<ul style="list-style-type: none"> • ON • OFF
→RAB Sonar System Failure(EyeSight→RAB)	Reverse Automatic Braking function, failure status of the sonar alarm function	—	<ul style="list-style-type: none"> • Normal • Sonar Failure • System Failure • Undefined
Sonar System HALT(RAB)	Reverse Automatic Braking function, temporary stop status of the sonar alarm function	—	<ul style="list-style-type: none"> • Normal • Fouling • Detection Error • Undefined
RAB Function pause Do Not Disturb	Disabled status of the Reverse Automatic Braking function temporary OFF switch for MFD	—	<ul style="list-style-type: none"> • Ready • Do Not Disturb
RAB Alarm pause Do Not Disturb	Disabled status of the sonar alarm function temporary OFF switch for MFD	—	<ul style="list-style-type: none"> • Ready • Do Not Disturb
Rear Sonar Distance Alarm Information (Rear Left Corner)	Rear sonar: Distance alert information of RLCorner (left corner, 3 stages)	—	<ul style="list-style-type: none"> • No Obstacle • Far • Middle • Short
Rear Sonar Distance Alarm Information (Rear Right Corner)	Rear sonar: Distance alert information of RRCorner (right corner, 3 stages)	—	<ul style="list-style-type: none"> • No Obstacle • Far • Middle • Short
Rear Sonar Distance Alarm Information (Rear Left Side)	Rear sonar: Distance alert information of RLSide (left side, 3 stages)	—	<ul style="list-style-type: none"> • No Obstacle • Far • Middle • Short
Rear Sonar Distance Alarm Information (Rear Right Side)	Rear sonar: Distance alert information of RRSide (left side, 3 stages)	—	<ul style="list-style-type: none"> • No Obstacle • Far • Middle • Short

Rear Sonar Distance Alarm Information (Rear Center)	Rear sonar: Distance alert information of RCenter (center, 4 stages)	—	<ul style="list-style-type: none"> • No Obstacle • Far • Middle • Short • Closest Approach
RAB Alarm Level	Reverse Automatic Braking function, alarm sound level information of the sonar alarm function	—	<ul style="list-style-type: none"> • OFF • Level1 • Level2 • Level3 • Continuous Sound
RAB Alarm Interrupt Display Instruction	Alarm interruption display information when the Reverse Automatic Braking function is activated	—	<ul style="list-style-type: none"> • No display • Backward Note • Encourage Stepping Brake • Undefined
Active Lane Keep System Main Display	Lighting request of lane keep display	—	<ul style="list-style-type: none"> • Light Off • Light On
Active Lane Keep System Buzzer	Notification sound on starting the lane keep control (not used)	—	<ul style="list-style-type: none"> • No Buzzer • Alarm
Left-Line Display (Grid Line)	Request signal for left-line (white) and lane keep display (green) illumination	—	<ul style="list-style-type: none"> • Light Off • Light On
Left-Line Display (Solid Line)	Request signal for left-line (white) illumination	—	<ul style="list-style-type: none"> • Light Off • Light On
Right-Line Display (Grid Line)	Request signal for right-line (white) and lane keep display (green) illumination	—	<ul style="list-style-type: none"> • Light Off • Light On
Right-Line Display (Solid Line)	Request signal for right-line (white) illumination	—	<ul style="list-style-type: none"> • Light Off • Light On
Lane Blink	Request signal for lane (solid line) blinking	—	<ul style="list-style-type: none"> • Light Off • Flashing at The Same Time • Flashing Alternately
Steering Wheel Display	Lane deviation warning light (handle mark) illumination signal	—	<ul style="list-style-type: none"> • Light Off • Light On • Flashing1 • Flashing2
Turn SW (Left)	Operation status of left turn switch	—	<ul style="list-style-type: none"> • OFF • ON
Turn SW (Right)	Operation status of right turn switch	—	<ul style="list-style-type: none"> • OFF • ON
Calibration (EPS)	Calibration signal (not used)	—	<ul style="list-style-type: none"> • Not set • Set

Steering Control Active	Lane keep control operation instruction	—	<ul style="list-style-type: none"> • Not Operate • Operate
Steering Assistance Operation Status	Lane keep control operation status	—	<ul style="list-style-type: none"> • Normal • Assist stop • Assist limitation
EyeSight Recognition Status (EPS)	EyeSight recognition status signal	—	<ul style="list-style-type: none"> • Not Detect • Detect
Absolute Steering Angle Detection	Absolute angle detection signal (not used)	—	<ul style="list-style-type: none"> • No • Yes
Steer Angle Sensor Op	Steering angle sensor signal	deg	—
+Yaw Rate Value (Right -) (Left +)	Yaw rate value signal	rad/sec	—
+Lateral G Sensor Value (Right -) (Left +)	Lateral acceleration signal	m/s ²	—
Steering Control Torque Target	Steering control instruction signal	Nm	—
Additional Steering Torque(Active Lane Keep System)	Additional steering torque signal (lane keep)	Nm	—
EPS Motor Operation Current	Motor operation current value	A	—
EPS Torque	Torque sensor main value	Nm	—
EPS Torque (Detailed)	Torque sensor value (resolution improved)	Nm	—
EPS Motor Operation Current (Steering Support High Speed)	Motor operation current value (high speed steering support)	Arms	—
Target Current Value (EPS)	Final target current value	Arms	—
EPS Motor Absolute Angle	Motor absolute angle	deg	—
HBA(EyeSight) Function Presence Information	HBA (EyeSight) function presence information	—	<ul style="list-style-type: none"> • No • Yes
Light Auto Switch Configuration Information	Light auto setting switch information	—	<ul style="list-style-type: none"> • OFF • ON
Dimmer Switch High	Dimmer switch at Hi	—	<ul style="list-style-type: none"> • OFF • ON
Dimmer Switch	Dimmer switch at Pass	—	<ul style="list-style-type: none"> • OFF

Pass			<ul style="list-style-type: none"> • ON
Driver Throttle Input Override Control	Instruction signal of AT false start prevention control Or instruction signal of AT false start (reverse) prevention control	—	<ul style="list-style-type: none"> • No • Pre-Collision BA Operation
Adaptive Cruise Control Torque Down	Torque down prohibition signal of stereo camera	—	<ul style="list-style-type: none"> • ON • OFF
Initial inspection distance accuracy rate	Accuracy rate of initial inspection distance	%	—
Initial inspection distance	Initial inspection distance	—	—
Initial Optical Axis (X-Axis)	Initial optical axis (X-axis)	pix	—
Initial Optical Axis (X-Axis2)	Initial optical axis (X-axis 2)	pix	—
Initial Optical Axis (Y-Axis)	Initial optical axis (Y-axis)	pix	—
Initial left image, rotation deviation correction value	Initial left image, rotation deviation correction value	—	—
Initial left image, vertical deviation correction value	Initial left image, vertical deviation correction value	—	—
Initial Right Image Rotation Deviation Correction Value	Initial right image, rotation deviation correction value	—	—
Initial distance correction value	Initial distance correction value	—	—
Initial Invalid Distance Data Count	Number of initial invalid distance data	—	—
Initial Other Inspection	Another initial inspection	—	—
Initial Error Code	Initial error code	—	—
D C-Ratio	Accuracy rate of inspection distance	%	—
Distance	Inspection distance	—	—
Optical Axis (X-Axis)	Optical axis (X-axis)	pix	—
Optical Axis (X-Axis2)	Optical axis (X-axis 2)	pix	—
Optical Axis (Y-Axis)	Optical axis (Y-axis)	pix	—

Left image, rotation deviation correction value	Left image, rotation deviation correction value	—	—
Left image, vertical deviation correction value	Left image, vertical deviation correction value	—	—
Right Image Rotation Deviation Correction Value	Right image, rotation deviation correction value	—	—
Distance correction value	Distance correction value	—	—
Ineffective distance data count	Number of invalid distance data	—	—
Other Inspection	Other inspection	—	—
Error Code	Error code detailed information	—	—
+Camera Battery Open Status (+B)	Display of stereo camera battery (+B circuit) status	—	<ul style="list-style-type: none"> • Connect • Open Load
Image ON/OFF status	ON/OFF status of present image sensor	—	<ul style="list-style-type: none"> • OFF • ON
Camera Temperature (Current)	Display of present temperature for internal circuit of stereo camera	°Celsius	—
Camera temperature, operation status	Camera temperature and operation status	—	<ul style="list-style-type: none"> • Normal • High temperature • Low temperature
Camera Temperature (Previous Maximum Value)	Display of stereo camera internal circuit temperature (past MAX value)	°Celsius	—
Ignition SW ON Count When Camera Temperature (Previous Maximum Value)	Ignition switch ON count when stereo camera internal circuit temperature is displayed (past MAX value)	Time	—
Camera Temperature (Previous Minimum Value)	Display of stereo camera internal circuit temperature (past MIN value)	°Celsius	—
Ignition SW ON Count When Camera Temperature	Ignition switch ON count when stereo camera internal circuit temperature is displayed (past MIN value)	Time	—

(Previous Minimum Value)			
EyeSight Temporary 0 Continuation Count	Continuation count of EyeSight temporary stop 0	Time	—
EyeSight Temporary 1 Continuation Count	Continuation count of EyeSight temporary stop 1	Time	—
EyeSight Temporary 2 Continuation Count	Continuation count of EyeSight temporary stop 2	Time	—
EyeSight Temporary 3 Continuation Count	Continuation count of EyeSight temporary stop 3	Time	—
EyeSight Temporary 4 Continuation Count	Continuation count of EyeSight temporary stop 4	Time	—
EyeSight Temporary 5 Continuation Count	Continuation count of EyeSight temporary stop 5	Time	—
EyeSight Temporary 6 Continuation Count	Continuation count of EyeSight temporary stop 6	Time	—
EyeSight Temporary 7 Continuation Count	Continuation count of EyeSight temporary stop 7	Time	—
EyeSight HALT Code	EyeSight halt code signal	—	<ul style="list-style-type: none"> • No • E1(No Camera View) • E2(Out of Temp. Range) • E3(Other)
Ambient Air Temperature(Indication)	Ambient air temperature signal	°Celsius	—
Ambient Air Temperature(Control)	Outside temperature for control signal	°Celsius	—
Head lamp : Clearance light	Headlight small signal status	—	<ul style="list-style-type: none"> • Light Off • Light On
Headlight SW (LO)	Headlight LO switch operation status	—	<ul style="list-style-type: none"> • OFF • ON
Head lamp : High Beam	Headlight Hi beam signal status	—	<ul style="list-style-type: none"> • Light Off • Light On
Wiper SW (Front)	Operation status of front wiper switch	—	<ul style="list-style-type: none"> • OFF

			<ul style="list-style-type: none"> • ON
VDC OFF SW	VDC OFF signal	—	<ul style="list-style-type: none"> • OFF • ON
VDC "OFF" Indicator Status	VDC-OFF indicator status	—	<ul style="list-style-type: none"> • Light Off • Light On
EyeSight Input Control Suspended Status (EPS)	Overheat protection limit signal	—	<ul style="list-style-type: none"> • No • Yes
Camera Failure Real-Time Check (At The Time of Failure)	Camera failure real-time information at the time of failure	—	—
Camera Temperature (At The Time of Failure)	Camera temperature sensor at the time of failure	°Celsius	—
Image ON/OFF Status/Sensor Ready Status (At The Time of Failure)	Image ON/OFF status at the time of failure	—	<ul style="list-style-type: none"> • OFF • ON
→Adaptive Cruise Control Failure (EyeSight→Combination Meter)	Stereo camera failure signal for combination meter	—	<ul style="list-style-type: none"> • Normal • FAIL
VDC Sensor Failure	VDC sensor failure signal	—	<ul style="list-style-type: none"> • Normal • FAIL
ABS System Failure	ABS system failure signal	—	<ul style="list-style-type: none"> • Normal • FAIL
Vehicle Speed Sensor Failure	Vehicle speed sensor failure signal	—	<ul style="list-style-type: none"> • Normal • FAIL
→Adaptive Cruise Control Failure (EyeSight→VDC)	Failure signal of stereo camera to VDC control module	—	<ul style="list-style-type: none"> • Normal • FAIL
EyeSight Reception (VDC)	Failure signal of stereo camera	—	<ul style="list-style-type: none"> • Not yet received • Reception
EPB Error Status	Electronic parking brake error information signal	—	<ul style="list-style-type: none"> • Normal • Stroke Too Short • Urgent Release • Pulling Power Abnormal
Hill Descent Control Status	Hill descent control status signal	—	<ul style="list-style-type: none"> • System OFF • Waiting • Operating • Infinite
Hill Start Assist Operation Status	Hill start assist operation status signal	—	<ul style="list-style-type: none"> • Not Operate • Operate

EyeSight Failure	EyeSight failure signal	—	<ul style="list-style-type: none"> • Normal • FAIL
Engine Failure	Engine failure signal	—	<ul style="list-style-type: none"> • Normal • FAIL
Transmission Failure	TCM failure signal	—	<ul style="list-style-type: none"> • Normal • FAIL
→EyeSight Failure (EPS→EyeSight)	Failure signal for EyeSight (EPS)	—	<ul style="list-style-type: none"> • Normal • FAIL
→Adaptive Cruise Control Failure (EyeSight→EPS)	Stereo camera failure signal for EPS control module	—	<ul style="list-style-type: none"> • Normal • FAIL
ETC Failure	Electronic throttle control failure signal	—	<ul style="list-style-type: none"> • Normal • FAIL
EEPROM Failure	Failure signal of combination meter	—	<ul style="list-style-type: none"> • Normal • FAIL
Brake Lamp SW Fail Status	Brake light switch failure signal	—	<ul style="list-style-type: none"> • Normal • FAIL
Brake Lamp Relay Drive	Brake light relay drive status signal	—	<ul style="list-style-type: none"> • Not Operating • Function check is in progress! Press Exit to abort.
EyeSight Communication Error (VDC)	Communication failure signal of stereo camera	—	<ul style="list-style-type: none"> • Normal • FAIL
Judgment of Lost Communication with Adaptive Cruise Control ECM CAN	No-receive signal of EyeSight CAN data	—	<ul style="list-style-type: none"> • Normal • Not Receive
EyeSight Received Data (ECM)	NG signal of stereo camera data	—	<ul style="list-style-type: none"> • Normal • FAIL
Steering Angle Sensor Status	Steering angle sensor status	—	<ul style="list-style-type: none"> • Normal • FAIL
Steering Angle Sensor Error Code	Steering angle sensor error code signal	—	<ul style="list-style-type: none"> • Normal • Failure EEPROM • IG Voltage Drop • Counter Overflow • ROM Trouble • Random Access Memory (RAM) Error • Magnetometric Sensor Trouble

→EyeSight Customization Change Request (Combination Meter→EyeSight)	EyeSight customization change request signal	—	<ul style="list-style-type: none"> • No • Pre-Collision BA Operation
→EyeSight Customization Reset Request (Combination Meter→EyeSight)	EyeSight customization reset request signal	—	<ul style="list-style-type: none"> • No • Pre-Collision BA Operation
→Lane Keeping Assist Control (EyeSight→Combination Meter)	EyeSight customization signal for lane keep assist to the center of the lane	—	<ul style="list-style-type: none"> • OFF • ON
→Red Light Recognition (Combination Meter→EyeSight)	EyeSight current change setting signal (for lane keep assist to the center of lane)	—	<ul style="list-style-type: none"> • OFF • ON
Target gear position	Target gear position signal	—	<ul style="list-style-type: none"> • P • R • Auto Neutral • 6 • 5 • 4 • 3 • 2 • 1 • N
Transmission Shift Control Mode	TCM shift control mode signal	—	<ul style="list-style-type: none"> • Position Fixed Mode • Gear Fixed Mode • Position Fixed Temporary • Gear Fixed Temporary • M Position • D Range Signal • —
Shift Position	Shift position information	—	<ul style="list-style-type: none"> • Error • P • R • N • D • D-S • 3 • 2

			<ul style="list-style-type: none"> • 1
CVT 8-speed Mode Control	CVT multi-stage speed control signal when EyeSight operates	—	<ul style="list-style-type: none"> • Not Operate • Operate
Lock up status	Lock up information	—	<ul style="list-style-type: none"> • Converter • Slip Lock Up • Lock-Up
Brake Lamp Status	Brake lamp state signal	—	<ul style="list-style-type: none"> • Light Off • Light On
Brake Vectoring Control Operation	Active torque vectoring control operation status	—	<ul style="list-style-type: none"> • Not Operate • Operate
EyeSight Specification	EyeSight distinction signal	—	<ul style="list-style-type: none"> • No • Yes
Vehicle Height	Vehicle height information	—	<ul style="list-style-type: none"> • Unknown • OBK • Standard
Fuel type	Fuel type	—	<ul style="list-style-type: none"> • Gasoline • Diesel
Engine Displacement	Engine displacement	—	<ul style="list-style-type: none"> • 1500cc • 2000cc • 2500cc • 3000cc • 3600cc • 1600cc
Camshaft Type	Engine type	—	<ul style="list-style-type: none"> • SOHC • DOHC
Number of Cylinders	Number of cylinder for engine	—	<ul style="list-style-type: none"> • 4 Cylinder • 6 Cylinder
Turbo	Presence or absence of turbo	—	<ul style="list-style-type: none"> • Turbo • NA
Vehicle Type	Vehicle type information signal	—	<ul style="list-style-type: none"> • Impreza Type • Forester Type • Exiga Type • Legacy/Outback Type • WRX Type
Destination	Destination code signal	—	<ul style="list-style-type: none"> • Japan • U.S(U4,U5,U6) • Canada(C0) • EURO(Left) (EC,EA,E2,EL) • General(Left) (K4) & Latin America(C4) • Middle & Near East(KS)

			<ul style="list-style-type: none"> • U.K(EK) • Thailand/Singapore(ER,EN) • Australia(KA,KC) • China(EH) • South Korea(C6)
WGN/SDN	Vehicle type signal	—	<ul style="list-style-type: none"> • Sedan • Wagon
Drive System	Driving method of AWD	—	<ul style="list-style-type: none"> • AWD • VTD • 2WD
AT Type	AT type	—	<ul style="list-style-type: none"> • CVT(TR58) • 4AT • 5AT • 6AT • CVT(TR690)
Steering Control Check 1	Stereo camera transmission data abnormal	—	<ul style="list-style-type: none"> • Normal • FAIL
Steering Control Check 2	Steering control instruction value from stereo camera abnormal	—	<ul style="list-style-type: none"> • Normal • FAIL
Active Lane Keep System Standby Status	Active lane keep assist stand-by status	—	<ul style="list-style-type: none"> • NG • OK
Lane Departure Prevention Assist Canceled Reason Control Check	Active lane keep, reason of cancelling the lane departure prevention assist	—	—
Active Lane Keep System Canceled Reason Control Check	Reason of cancelling the lane keep assist (system failure)	—	—
Active Lane Keep System Recognition Check 1	Lane keep assist - recognition data detailed information 1	—	—
Active Lane Keep System Recognition Check 2	Lane keep assist - recognition data detailed information 2	—	—
Active Lane Keep System Recognition Check 4	Lane keep assist - recognition data detailed information 4	—	—
Active Lane Keep System Recognition Check 6	Lane keep assist - recognition data detailed information 6	—	—
Lane Departure Prevention Assist	Lane departure prevention assist - control data detailed information 3	—	—

Control Check 3			
Active Lane Keep System Control Check 3	Lane keep assist - control data detailed information 3	—	—
Active Lane Keep System Control Check 4	Lane keep assist - control data detailed information 4	—	—
Active Lane Keep System Control Check 5	Lane keep assist - control data detailed information 5	—	—
Camera Battery Voltage (At The Time of EyeSight Temporary)	ECM power supply voltage (at an EyeSight temporary stop)	V	—
Camera Temperature Sensor (At The Time of EyeSight Temporary)	Camera temperature (at an EyeSight temporary stop)	°Celsius	—
Automatic Adjustment Status Check (At The Time of EyeSight Temporary)	Automatic adjustment status (at an EyeSight temporary stop)	—	—
Camera Adjustment Value 1 (At The Time of EyeSight Temporary)	Camera adjustment value detailed information 1 (at an EyeSight temporary stop)	—	—
Camera Adjustment Value 2 (At The Time of EyeSight Temporary)	Camera adjustment value detailed information 2 (at an EyeSight temporary stop)	—	—
Camera Adjustment Value 3 (At The Time of EyeSight Temporary)	Camera adjustment value detailed information 3 (at an EyeSight temporary stop)	—	—
EyeSight Temporary Detail Check 1	EyeSight temporary stop. Detailed information 1	—	—
EyeSight Temporary Detail Check 2	EyeSight temporary stop. Detailed information 2	—	—
EyeSight Temporary Detail Check 3	EyeSight temporary stop. Detailed information 3	—	—
EyeSight Temporary Detail Check 4	EyeSight temporary stop. Detailed information 4	—	—
Details Check 1 (At	EyeSight temporary stop, detailed information	—	—



The Time of EyeSight Temporary)	1		
Details Check 2 (At The Time of EyeSight Temporary)	EyeSight temporary stop, detailed information 2	—	—
Details Check 3 (At The Time of EyeSight Temporary)	EyeSight temporary stop, detailed information 3	—	—
Details Check 4 (At The Time of EyeSight Temporary)	EyeSight temporary stop, detailed information 4	—	—
Camera Temperature Operation Status (At The Time of EyeSight Temporary)	Stereo camera operation status at the time of EyeSight temporary stop	—	<ul style="list-style-type: none"> • Normal • High temperature • Low temperature
Camera failure real-time information	Current camera failure information	—	—
Camera Failure Details Cumulative Check 1	Camera failure details. Cumulative information 1	—	—
Camera Failure Details Cumulative Check 2	Camera failure details. Cumulative information 2	—	—
Camera Failure Details Cumulative Check 3	Camera failure details. Cumulative information 3	—	—
Camera Failure Details Cumulative Check 4	Camera failure details. Cumulative information 4	—	—
Camera Failure Details Cumulative Check 5	Camera failure details. Cumulative information 5	—	—
Camera Failure Details Cumulative Check 6	Camera failure details. Cumulative information 6	—	—
Camera Failure Details Cumulative Check 7	Camera failure details. Cumulative information 7	—	—
Camera Failure	Camera failure details. Cumulative	—	—

Details Cumulative Check 8	information 8		
Camera Failure Details Cumulative Check 9	Camera failure details. Cumulative information 9	—	—
Camera Failure Details Cumulative Check 10	Camera failure details. Cumulative information 10	—	—
Camera Failure Details Cumulative Check 11	Camera failure details. Cumulative information 11	—	—
Camera Failure Details Cumulative Check 12	Camera failure details. Cumulative information 12	—	—
Camera Failure Details Cumulative Check 13	Camera failure details. Cumulative information 13	—	—
Camera Failure Details Cumulative Check 14	Camera failure details. Cumulative information 14	—	—
Camera Temperature Abnormality Ignition SW ON Count Check 1	Camera temperature abnormal IG ON count 1	Time	—
Camera Temperature Abnormality Ignition SW ON Count Check 2	Camera temperature abnormal IG ON count 2	Time	—
Camera Temperature Abnormality Ignition SW ON Count Check 3	Camera temperature abnormal IG ON count 3	Time	—
Camera Temperature Abnormality Ignition SW ON Count Check 4	Camera temperature abnormal IG ON count 4	Time	—
Camera Temperature Abnormality Ignition SW ON Count Check 5	Camera temperature abnormal IG ON count 5	Time	—


Camera Adjustment Value 1	Camera adjustment value detailed information 1	—	—
Camera Adjustment Value 2	Camera adjustment value detailed information 2	—	—
Camera Adjustment Value 3	Camera adjustment value detailed information 3	—	—
Camera Status Check 1	Camera status detailed information 1	—	—
Camera Status Check 2	Camera status detailed information 2	—	—
Camera Status Check 3	Camera status detailed information 3	—	—
Camera Status Check 4	Camera status detailed information 4	—	—
Camera Status Check 5	Camera status detailed information 5	—	—
Camera Status Check 6	Camera status detailed information 6	—	—
Camera Status Check 7	Camera status detailed information 7	—	—
Camera Status Check 8	Camera status detailed information 8	—	—
Camera Status Check 9	Camera status detailed information 9	—	—
Camera Status Check 10	Camera status detailed information 10	—	—
Camera Status Check 11	Camera status detailed information 11	—	—
Camera Status Check 12	Camera status detailed information 12	—	—
Camera Status Check 13	Camera status detailed information 13	—	—
Camera Status Check 14	Camera status detailed information 14	—	—
Camera Status Check 15	Camera status detailed information 15	—	—
Camera Status Check 16	Camera status detailed information 16	—	—
Camera Status Check 17	Camera status detailed information 17	—	—
Camera Status Check 18	Camera status detailed information 18	—	—
Camera Status Check 19	Camera status detailed information 19	—	—

Camera Status Check 20	Camera status detailed information 20	—	—
Camera Status Check 21	Camera status detailed information 21	—	—
Camera Status Check 22	Camera status detailed information 22	—	—
Camera Status Check 23	Camera status detailed information 23	—	—
Camera Status Check 24	Camera status detailed information 24	—	—
Camera Status Check 25	Camera status detailed information 25	—	—
Front Axle Average Wheel Speed (At The Time of EyeSight Temporary)	Front axle wheel average speed at the time of EyeSight temporary stop	km/h	—
Ignition SW ON Count (At The Time of EyeSight Temporary)	IG ON count at the time of EyeSight temporary stop	Time	—
EyeSight Failure (ADB/HBA)	EyeSight failure information (ADB/HBA)	—	<ul style="list-style-type: none"> • Normal • EyeSight Failure
EyeSight Halt (ADB/HBA)	EyeSight temporary stop information (ADB/HBA)	—	<ul style="list-style-type: none"> • OFF • HALT
EyeSight Initialization(ADB/HBA)	Initialization completion information at EyeSight activation (ADB/HBA)	—	<ul style="list-style-type: none"> • During Initialization • Started
HBA Control Permission	Hi beam permission information	—	<ul style="list-style-type: none"> • Prohibition • Permit
Adjust Sensitivity Flag(ADB/HBA)	Information indicating ON/OFF status of adjust sensitivity	—	<ul style="list-style-type: none"> • Not Adjust Sensitivity • Adjust Sensitivity
Judgment Night	Night status information judging by stereo camera	—	<ul style="list-style-type: none"> • Other Than Night • Night


2. ENGINE CONTROL MODULE (ECM)

For data monitor of engine control module, refer to ENGINE (DIAGNOSTICS).  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)


3. VDC CONTROL MODULE (VDCCM)

For data monitor of VDC control module, refer to BRAKE CONTROL (DIAGNOSTICS).  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)


4. TRANSMISSION CONTROL MODULE (TCM)

For data monitor of transmission control module, refer to TRANSMISSION (DIAGNOSTICS).  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

5. BODY INTEGRATED UNIT

Refer to BODY CONTROL SYSTEM (DIAGNOSTICS) for the data monitor of the body integrated unit.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Data Monitor.](#)


6. POWER STEERING CM

For data monitor of power steering CM, refer to POWER ASSISTED SYSTEM (POWER STEERING) (DIAGNOSTICS).  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

7. COMBINATION METER

For data monitor of the combination meter, refer to COMBINATION METER (DIAGNOSTICS).  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Data Monitor.](#)

8. RAB CM

For data monitor of the RAB CM, refer to Reverse Automatic Braking (DIAGNOSTICS).  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Data Monitor.](#)

EyeSight (DIAGNOSTICS) > Data Monitor

OPERATION

- 1.** On [Start] display, select [Diagnosis].
- 2.** On [Vehicle selection] display, input the target vehicle information and select [OK].
- 3.** On [Main Menu] display, select [Each System].
- 4.** On [Select System] display, select [EyeSight], and then select [Enter].
- 5.** On [Select Function] display, select [Data monitor].







Note:







For detailed operation procedures, refer to “Application help”.









EyeSight (DIAGNOSTICS) > Diagnostic Code(s) Display

LIST






DTC	Item	Contents of diagnosis	Note
U0073	Control Module Communication Bus Off	Detected when bus off status (the stereo camera detects the failure and is disconnected from CAN line) occurs.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0100	Lost Communication With ECM/PCM "A"	Detected when CAN data from ECM is not transmitted to stereo camera.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0101	Lost Communication With TCM	Detected when CAN data from TCM is not transmitted to stereo camera.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0122	Lost Communication With Vehicle Dynamics Control Module	Detected when CAN data from VDC is not transmitted to stereo camera.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0126	Lost Communication With Steering Angle Sensor Module	Detected when CAN data from steering angle sensor is not transmitted to stereo camera.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0126 LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE.
U0131	Lost Communication With Power	Detected when CAN data from EPS CM is not transmitted to stereo camera.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC








	Steering Control Module		U0131 LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE.
U0140	Lost Communication With Body Control Module	Detected when CAN data from body integrated unit is not transmitted to stereo camera.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0155	Lost Communication With Instrument Panel Cluster (IPC) Control Module	Detected when CAN data from combination meter is not transmitted to stereo camera.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0401	Invalid Data Received From ECM/PCM "A"	Failure counter diagnosis of engine control module (ECM)	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".
U0402	Invalid Data Received From TCM	Failure counter diagnosis of automatic transmission control module (TCM)	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0402 INVALID DATA RECEIVED FROM TCM.
U0416	Invalid Data Received From Vehicle Dynamics Control Module	Failure counter diagnosis of VDC control module (VDC CM)	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0420	Invalid Data Received From Power Steering Control Module	Failure counter diagnosis of EPS CM	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC






			U0420 INVALID DATA RECEIVED FROM POWER STEERING CONTROL MODULE.
U0422	Invalid Data Received From Body Control Module	Failure counter diagnosis of body integrated unit	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE.
U0423	Invalid Data Received From Instrument Panel Cluster Control Module	Failure counter diagnosis of combination meter	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.
U0428	Invalid Data Received From Steering Angle Sensor Module	Failure counter diagnosis of steering angle sensor	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0428 INVALID DATA RECEIVED FROM STEERING ANGLE SENSOR MODULE.
U1073	Control Module Communication Bus "SONAR-CAN" Off	Detected when bus off status (the stereo camera detects the failure and is disconnected from CAN line) occurs.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1073 CONTROL MODULE COMMUNICATION BUS "SONAR-CAN" OFF.
U1233	Lost Communication with RAB Control Module	Detected when CAN data from sonar is not transmitted to stereo camera.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1233 LOST COMMUNICATION WITH RAB CONTROL MODULE.
U1534	Invalid Data Received from Sonar ECU	Failure counter diagnosis of sonar.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC








			U1534 INVALID DATA RECEIVED FROM SONAR ECU.
B2801	TCM Abnormal	Detected when error occurs in the automatic transmission.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2801 TCM ABNORMAL.
B2802	ETC Abnormal	Detected when error occurs in the electronic throttle control.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2802 ETC ABNORMAL.
B2803	EPB OPERATION PROHIBIT	EPB operation is prohibited.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2803 EPB OPERATION PROHIBIT.
B2804	EPB NO ACTIVITY DETECTED	EPB control is abnormal.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2804 EPB NO ACTIVITY DETECTED.
B2806	ECM Abnormal	Detected when error occurs in the engine control module (ECM).	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2806 ECM ABNORMAL.
B2807		Detected when cruise indicator illumination request from ECM and ON/OFF information of cruise function do not match.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2807 ECM ABNORMAL.
B2809	VDC Malfunction	Detected when error occurs in the VDC.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2809 VDC MALFUNCTION.
B280A	VDC Echo Back Disagreement	Detected when error occurs in the VDC. (VDC brake control error 1)	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC

			B280A VDC ECHO BACK DISAGREEMENT.
B280B	VDC Brake Fluid Pressure	Detected when error occurs in the VDC. (VDC brake control error 3)	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B280B VDC BRAKE FLUID PRESSURE.
B280F	Meter Failure	Detected when error occurs in the CAN communication with combination meter.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B280F COMBINATION METER MALFUNCTION.
B2810	Incompatible with EyeSight (Combination Meter)	Detected when different (undesigned) type of combination meter is installed.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2810 INCOMPATIBLE WITH EyeSight (COMBINATION METER).
B2811	EPS Abnormal	EPS abnormal.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2811 EPS ABNORMAL.
B2814	Power Supply Low Voltage	Detected when battery voltage is below specified value or when the +B harness of the stereo camera is broken.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2814 POWER SUPPLY LOW VOLTAGE.
B2815	Power Supply High Voltage	Detected when battery voltage exceeds the specified value.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2815 POWER SUPPLY HIGH VOLTAGE.
B2817	Brake Lamp	Detected when error occurs in the brake light illumination circuit.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2817 BRAKE LAMP.
B281B	Steering Angle Sensor abnormal	Detected when error occurs in the steering angle sensor system.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic

			Procedure with Diagnostic Trouble Code (DTC)>DTC B281B STEERING ANGLE SENSOR FAIL.
B281C	Incompatible with EyeSight (EPS)	Detected when the EPS CM which is not exclusively for EyeSight is installed.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B281C INCOMPATIBLE WITH EyeSight (EPS).
B281E	RAB Control Module	Detected when error occurs in sonar or RAB CM.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B281E RAB CONTROL MODULE.
B281F	Reverse Automatic Braking Override	Detected when a stop hold command is output from RAB CM even when an accelerator override is executed by the driver.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B281F REVERSE AUTOMATIC BRAKING OVERRIDE.
B2821	Reverse Automatic Braking Control Prohibition	Detected when error occurs in RAB CM.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2821 REVERSE AUTOMATIC BRAKING CONTROL PROHIBITION.
B28A0	Vehicle Model Judgment	Detected when the model code stored in EEPROM and the model code used for CAN data are different, or when +B harness of the stereo camera is broken at aiming completion.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28A0 VEHICLE MODEL JUDGMENT.
B28A1	EyeSight Communication(ECM)	Abnormal judgment for stereo camera by ECM Or detected when the stereo camera or ECM is assembled incorrectly.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28A1 EyeSight COMMUNICATION(ECM).
B28A2	EyeSight Communication(VDC)	Abnormal judgment for stereo camera data by VDC	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic

			Trouble Code (DTC)>DTC B28A2 EyeSight COMMUNICATION(VDC).
B28A3	EyeSight Communication(Meter)	Abnormal judgment for stereo camera data by combination meter	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28A3 EyeSight COMMUNICATION(METER).
B28A4	EyeSight Communication(EPS)	Abnormal judgment for stereo camera data by EPS CM	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28A4 EyeSight COMMUNICATION(EPS).
B28A5	Engine Torque Limiter Control Prohibit	Detected when error occurs in the transmission data from stereo camera to ECM.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28A5 ENGINE TORQUE LIMITER CONTROL PROHIBIT.
B28A6	Internal Stereo Camera Communication 1	Detected when an communication error occurs inside the stereo camera.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28A6 INTERNAL STEREO CAMERA COMMUNICATION 1.
B28A7	Stereo Camera Recognition(Target)	Detected when error occurs in the communication data inside the control module due to external factors such as noises.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28A7 STEREO CAMERA RECOGNITION(TARGET).
B28A8	Internal Stereo Camera Communication 2		 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28A8 INTERNAL STEREO CAMERA COMMUNICATION 2.
B28A9	Stereo Camera Synchronized Recognition Data		 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic

			Trouble Code (DTC)>DTC B28A9 STEREO CAMERA SYNCHRONIZED RECOGNITION DATA.
B28AA	Stereo Camera Microcomputer 1	Detected when error occurs in the communication with microcomputer 1 system inside the stereo camera.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28AA STEREO CAMERA MICROCOMPUTER 1.
B28AB	Stereo Camera Microcomputer 2	Detected when error occurs in the communication with microcomputer 2 system inside the stereo camera.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28AB STEREO CAMERA MICROCOMPUTER 2.
B28AC	Stereo Camera ASIC	Detected when error occurs in the ASIC system inside the stereo camera.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28AC STEREO CAMERA ASIC.
B28AD	Stereo Camera Image Recognition	Detected when error occurs in the stereo camera image system.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28AD STEREO CAMERA IMAGE RECOGNITION.
B28AE	Internal Stereo Camera Power Supply	Detected when error occurs in the internal power supply system of stereo camera.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28AE INTERNAL STEREO CAMERA POWER SUPPLY.
B28AF	Stereo Camera Adjustment Incomplete	Detected when adjustment/inspection of camera has not been completed normally.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28AF STEREO CAMERA ADJUSTMENT INCOMPLETE.
B28B1	Stereo Camera Automatic Adjustment	Detected when the optical axis of stereo camera is deviated in lateral direction or when the fluctuation range of automatic adjustment value has been enlarged.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC

			B28B1 STEREO CAMERA AUTOMATIC ADJUSTMENT.
B28B2	Stereo Camera High Temperature	Detected when the temperature of the stereo camera excessively increases. (When this DTC is detected, the camera will not return to the normal state after performing adjustment or inspection. In this case, always replace the stereo camera.)	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B2 STEREO CAMERA HIGH TEMPERATURE.
B28B3	Stereo Camera Low Temperature	Detected when the temperature of the stereo camera excessively decreases. (When this DTC is detected, the camera will not return to the normal state after performing adjustment or inspection. In this case, always replace the stereo camera.)	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B3 STEREO CAMERA LOW TEMPERATURE.
B28B5	+B Circuit Open	Detected when there is an open circuit in power supply line of the stereo camera.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B5 +B CIRCUIT OPEN.
B28B6	Pre-Collision OFF Switch	Pre-collision brake switch or harness is faulty. Detected also when the switch is held down for over 45 seconds.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B6 PRE-COLLISION OFF SWITCH.
B28B7	LDP OFF Switch	Lane departure warning OFF switch or harness is faulty. Detected also when the switch is held down for over 45 seconds.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B7 LDP OFF SWITCH.
B28B8	EyeSight Steering Switch 1	Detected when EyeSight steering switch is malfunctioning, when the harness is abnormal or when there is an open circuit.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B8 EyeSight SWITCH 1 ABNORMAL.
B28B9	EyeSight Steering Switch 2		 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B9 EyeSight STEERING SWITCH 2.
B28BA	Steering Angle and		 Ref. to EyeSight


	Stereo Camera correlation misaligned	<ul style="list-style-type: none">• Detected when the center point of the steering angle sensor is misaligned.• Detected when the alignment is extremely misaligned.	(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28BA STEERING ANGLE AND STEREO CAMERA CORRELATION MISALIGNED.
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EyeSight (DIAGNOSTICS) > Diagnostic Code(s) Display

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [EyeSight], and then select [Enter].
5. On [Select Function] display, select [DTC].

Note:

- For detailed operation procedures, refer to “Application help”.
- For details concerning DTC, refer to “List of Diagnostic Trouble Code (DTC)”.
-  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Code(s) Display>LIST.
- Up to ten codes can be stored. When more than ten codes are output, they will not be stored.
- The same code is stored only once, and even when the same code occurs several times, information will not be updated.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2801 TCM ABNORMAL

Detected when error occurs in the automatic transmission.

When lost communication with TCM and TCM abnormal occur simultaneously, perform diagnosis for lost communication with TCM first.

Note:



Check the automatic transmission.  **[Ref. to TRANSMISSION \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)**

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2802 ETC ABNORMAL


Detected when error occurs in the electronic throttle control.

Note:

Check the electronic throttle control.  **[Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Basic Diagnostic Procedure.](#)**  **[Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Basic Diagnostic Procedure>PROCEDURE.](#)**

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2803 EPB OPERATION PROHIBIT

EPB operation is prohibited. When the DTC is detected by the brake maintenance mode for VDC, the system malfunction does not exist. Therefore, clear the memory.  [Ref. to EyeSight \(DIAGNOSTICS\)>Clear memory.](#)

Note:

Check the VDC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2804 EPB NO ACTIVITY DETECTED

EPB control is abnormal.

Note:



Check the VDC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2806 ECM ABNORMAL

Detected when error occurs in the engine control module (ECM).

Note:



Perform check of the ECM.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Basic Diagnostic Procedure>PROCEDURE.](#)  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Basic Diagnostic Procedure>PROCEDURE.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2807 ECM ABNORMAL

Detected when cruise indicator illumination request from ECM and ON/OFF information of cruise function do not match.

Note:

Perform check of the ECM.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Basic Diagnostic Procedure>PROCEDURE.](#)  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Basic Diagnostic Procedure>PROCEDURE.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2809 VDC MALFUNCTION

Detected when error occurs in the VDC. (VDC failure)

When lost communication with vehicle dynamics control and vehicle dynamics control module abnormal or VDC echo back disagreement occur simultaneously, perform diagnosis for lost communication with vehicle dynamics control first.

Note:

Check the VDC.  **[Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)**

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B280A VDC ECHO BACK DISAGREEMENT

Detected when error occurs in the VDC. (VDC brake control error 1)

When lost communication with vehicle dynamics control and vehicle dynamics control module abnormal or VDC echo back disagreement occur simultaneously, perform diagnosis for lost communication with vehicle dynamics control first.

Note:

Check the VDC.  **[Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)**

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B280B VDC BRAKE FLUID PRESSURE

Detected when error occurs in the VDC. (VDC brake control error 3)

Note:

Check the VDC.  **[Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)**

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B280F COMBINATION METER MALFUNCTION

Malfunction is detected in the combination meter.

DTC detecting condition:

Defective combination meter

Trouble symptom:

- All functions of EyeSight system do not operate.
- EyeSight warning light blinks or illuminates.
- Combination meter does not illuminate.

Note:

Check the combination meter.  **Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.**

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2810 INCOMPATIBLE WITH EYESIGHT (COMBINATION METER)

Detected when the combination meter, which is not designed exclusively for EyeSight is installed.


DTC detecting condition:

Incorrect specifications of combination meter

Trouble symptom:

All functions of EyeSight system do not operate.

Note:

Replace the combination meter with the one designed for EyeSight.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2811 EPS ABNORMAL

Malfunction is detected in the electric power steering.

Note:

Check the electric power steering.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2814 POWER SUPPLY LOW VOLTAGE

Detected when the status of 7.0 V or less continues approximately for 5 seconds and is judged to be low-voltage malfunction, or when the +B harness of the stereo camera is broken.

DTC detecting condition:

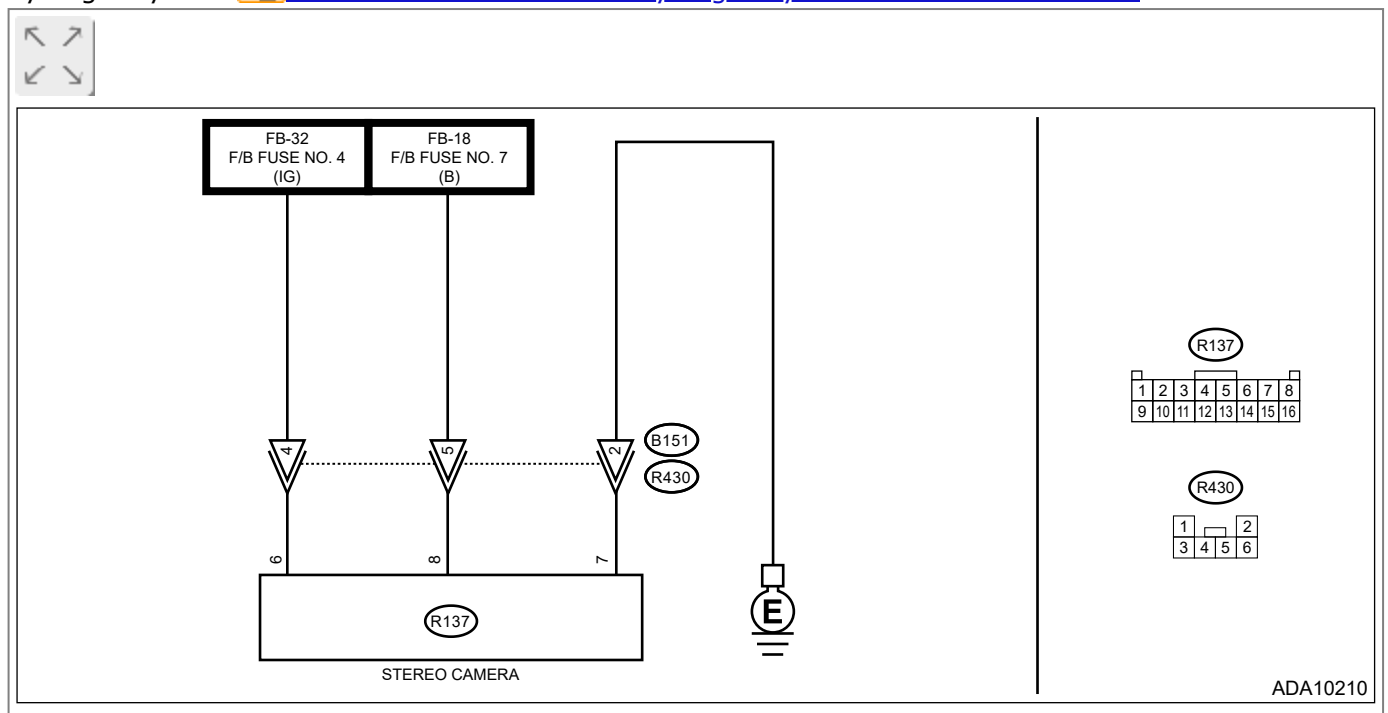
- Input voltage to stereo camera is out of specifications.
- Defective stereo camera control harness (open circuit in +B harness)
- Defective stereo camera

Trouble symptom:

- All functions of EyeSight system do not operate.
- EyeSight warning light blinks or illuminates.
- CRUISE indicator light blinks.
- Malfunction indicator light illuminates.
- VDC warning light illuminates.
- ATF temperature warning light illuminates.

Wiring diagram:

EyeSight system  [Ref. to WIRING SYSTEM>EyeSight System>WIRING DIAGRAM.](#)



1. CHECK GENERATOR.


1. Start the engine and idle for a while.
2. Measure the voltage between generator terminal B and chassis ground.

Connector & terminal


Generator terminal B (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

Check the generator.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Generator.](#)

2. CHECK BATTERY TERMINAL.

1. Turn the ignition switch to OFF.
2. Check the battery terminal connection status.

Is the check result OK?


Yes

 [Go to 3.](#)

No


Tighten the battery terminal securely.

3. CHECK FUSE.

Check the fuse.  [Ref. to EyeSight>Relay and Fuse.](#)

Is the check result OK?

Yes

 [Go to 4.](#)

No

Replace the defective fuse. When the replaced fuse blows out easily, check the short circuit in harness.

4. CHECK HARNESS (POWER SUPPLY CIRCUIT).

1. Disconnect the stereo camera.
2. Turn the ignition switch to ON.
3. Measure the voltage between harness connector of stereo camera and chassis ground.


Connector & terminal

(R137) No. 6 (+) — Chassis ground (-):

(R137) No. 8 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 5.](#)

No

Check the power supply system circuit, and if any fault is found, repair the defective parts or replace the harness. Check the Auto Start Stop system.

5. CHECK HARNESS (GROUND CIRCUIT).


1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery.
3. Measure the resistance between stereo camera and chassis ground.

Connector & terminal

(R137) No. 7 — Chassis ground:

Is the resistance less than 10 Ω?

Yes

 [Go to 6.](#)

No

Check the ground system circuit, and if any fault is found, repair the defective parts or replace the harness.

6. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the stereo camera connector.

Is the check result OK?



Yes

 [Go to 7.](#)

No

Repair the connector.

7. CHECK STEREO CAMERA.

1. Connect all connectors and battery terminals securely.
2. Start the engine, drive the vehicle at 40 km/h (24.9 MPH) or more, stop the vehicle and then stop the engine.
3. After 3 seconds or more have elapsed, restart the engine.
4. Clear the memory.  [Ref. to EyeSight \(DIAGNOSTICS\)>Clear memory.](#)
5. Read the DTC.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Code\(s\) Display.](#)

Is DTC B2814 or B2815 displayed?

Yes

Replace the stereo camera.  [Ref. to EyeSight>Stereo Camera>REMOVAL.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.


Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2815 POWER SUPPLY HIGH VOLTAGE

Detected when the status for the battery voltage of 16 V or more continues approximately for 5 seconds and is judged to be abnormally high voltage.

Refer to DTC B2814 for DTC detecting condition, trouble symptom and diagnostic procedure. 

[Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2814 POWER SUPPLY LOW VOLTAGE.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2817 BRAKE LAMP


DTC detecting condition:

- Defective brake light relay
- Defective brake light switch
- Defective VDC

Trouble symptom:

- All functions of EyeSight system do not operate.
- EyeSight warning light illuminates.
- Brake light does not go off or illuminate.

Note:

When this DTC is detected, check VDC system.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B281B STEERING ANGLE SENSOR FAIL

DTC detecting condition:

Defective steering angle sensor

Trouble symptom:

All functions of EyeSight system do not operate.

Note:

Check the VDC.  **[Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)**

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B281C INCOMPATIBLE WITH EYESIGHT (EPS)

Detected when the EPS CM which is not exclusively for EyeSight is installed.

DTC detecting condition:

Incorrect specifications of EPS CM.

Trouble symptom:

All functions of EyeSight system do not operate.

Note:

Replace the EPS CM with the one exclusively designed for EyeSight.  Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Power Steering Control Module.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B281E RAB CONTROL MODULE

Detected when error occurs in sonar or RAB CM.


DTC detecting condition:

- Defective RAB CM.
- Defective unit that performs cooperation control with stereo camera.

Trouble symptom:


- The Reverse Automatic Braking function does not operate.
- RAB warning light illuminates.
- All functions of EyeSight system do not operate. (Functions terminated due to a cooperative control unit failure)
- EyeSight warning light illuminates. (Functions terminated due to a cooperative control unit failure)

1. CHECK DTC.

Read the DTC related to EyeSight. (Determine a failure of cooperative control unit)  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Code\(s\) Display.](#)

Is DTC other than DTC B281E displayed?


Yes

Perform the diagnosis for the displayed DTCs.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Code\(s\) Display>LIST.](#)

No


 [Go to 2.](#)

2. CHECK DTC.

Read DTC of Reverse Automatic Braking.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes

Perform the diagnosis for the displayed DTCs.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\)>LIST.](#)

No

Finish the diagnosis.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B281F REVERSE AUTOMATIC BRAKING OVERRIDE

Detected when a stop hold command is output from RAB CM even when an accelerator override is executed by the driver.

DTC detecting condition:

Defective RAB CM.

Trouble symptom:

- The Reverse Automatic Braking function does not operate.
- RAB warning light illuminates.

Note:

Check the sonar system.  **Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Basic Diagnostic Procedure.**

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2821 REVERSE AUTOMATIC BRAKING CONTROL PROHIBITION

Detected when error occurs in RAB CM.

DTC detecting condition:

Defective RAB CM.

Trouble symptom:

- The Reverse Automatic Braking function does not operate.
- RAB warning light illuminates.

Note:

Check the sonar system.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28A0 VEHICLE MODEL JUDGMENT

Detected when the model code for stereo camera and the model code used for CAN data are different.

DTC detecting condition:

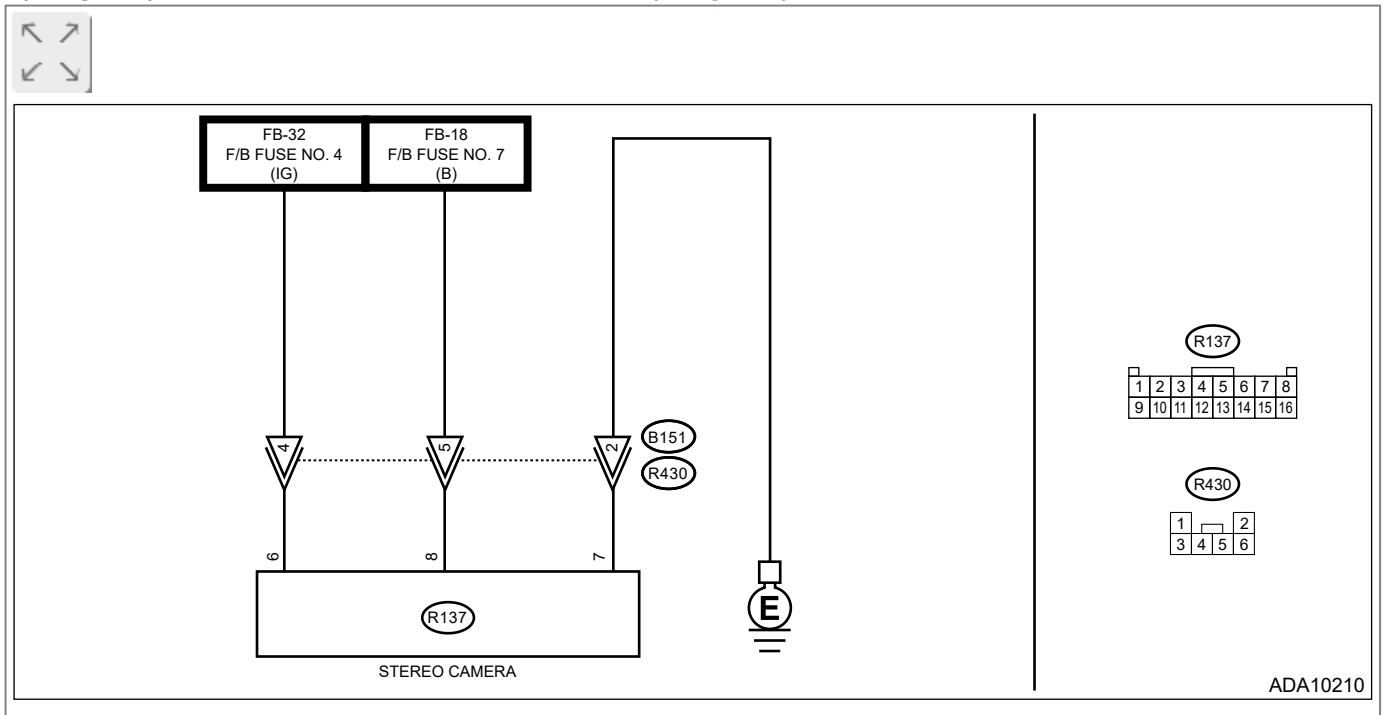
- Defective CAN system
- Defective stereo camera
- In the aiming operation, there is an open circuit in the +B harness of the stereo camera.
- In the completion of the aiming operation, the switching from IGN OFF to IGN ON takes place too early, and the recording of the model information has not yet been finished.

Trouble symptom:

- All functions of EyeSight system do not operate.
- EyeSight warning light illuminates.

Wiring diagram:

EyeSight system  [Ref. to WIRING SYSTEM>EyeSight System>WIRING DIAGRAM.](#)




1. CHECK RELATED CM.

Check the part number of the ECM, TCM, VDC CM and combination meter.

Is each CM a genuine part?

Yes

 [Go to 2.](#)

No

Replace the non-genuine CM with a genuine one.

2. CHECK STEREO CAMERA.



1. Remove the camera cover.
2. Check the part number of the stereo camera.

Is the stereo camera genuine?

Yes

[Go to 3.](#)

No

Replace the stereo camera. [Ref. to EyeSight>Stereo Camera>REMOVAL.](#)

3. CHECK LAN SYSTEM.



Perform the diagnosis for LAN system. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is DTC for LAN system displayed?

Yes

Perform the diagnosis of DTCs for LAN system.

No

[Go to 4.](#)

4. CHECK MODEL REGISTRATION INFORMATION.



Check the model registration information from the current data of stereo camera. [Ref. to EyeSight \(DIAGNOSTICS\)>Data Monitor.](#)

Does vehicle and data correspond?

Yes

Perform the adjustment or inspection of the camera. [Ref. to EyeSight>Camera Adjustment, Inspection.](#)

No

[Go to 5.](#)


5. CHECK FUSE.



Check the fuse. [Ref. to EyeSight>Relay and Fuse.](#)

Is the check result OK?

Yes

 [Go to 6.](#)

No

Replace the defective fuse. When the replaced fuse blows out easily, check the short circuit in harness.

6. CHECK HARNESS (POWER SUPPLY CIRCUIT).



1. Disconnect the stereo camera.
2. Turn the ignition switch to ON.
3. Measure the voltage between harness connector of stereo camera and chassis ground.


Connector & terminal

(R137) No. 6 (+) — Chassis ground (-):

(R137) No. 8 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 7.](#)

No

Check the power supply system circuit, and if any fault is found, repair the defective parts or replace the harness.

7. CHECK HARNESS (GROUND CIRCUIT).



1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery.
3. Measure the resistance between stereo camera and chassis ground.

Connector & terminal

(R137) No. 7 — Chassis ground:

Is the resistance less than 10 Ω ?

Yes

 [Go to 8.](#)

No

Check the ground system circuit, and if any fault is found, repair the defective parts or replace the harness.


8. CHECK POOR CONTACT OF CONNECTORS.



1. Check stereo camera connector.
2. Check for poor contact of connector.

Is the check result OK?

Yes



 [Go to 9.](#)

No

Repair the connector.

9. CHECK STEREO CAMERA.



1. Connect all connectors and battery terminals securely.
2. Clear the memory.  [Ref. to EyeSight \(DIAGNOSTICS\)>Clear memory.](#)
3. Read the DTC.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Code\(s\) Display.](#)

Is DTC B28A0 displayed?

Yes

Replace the stereo camera.  [Ref. to EyeSight>Stereo Camera>REMOVAL.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28A1 EYESIGHT COMMUNICATION(ECM)

Detected when the engine control module (ECM) detects the malfunction of stereo camera, or when the stereo camera or ECM is assembled incorrectly.

DTC detecting condition:

- Defective CAN system
- Defective engine control module (ECM)
- Defective stereo camera
- Incompatibility of stereo camera (when the stereo camera designed for EyeSight (Ver.2) type vehicle is installed to the EyeSight (Ver.3) type vehicle, etc.)
- Incorrect assembly of ECM (when the ECM designed for another model is installed, etc.)

Trouble symptom:


- All functions of EyeSight system do not operate.
- EyeSight warning light illuminates.

1. CHECK ECM.


Check the part number of the ECM.

Is the ECM genuine?

Yes

 [Go to 2.](#)

No


Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Engine Control Module \(ECM\).](#)

2. CHECK STEREO CAMERA.

1. Remove the camera cover.
2. Check the part number of the stereo camera.

Is the stereo camera genuine?


Yes

 [Go to 3.](#)

No

Replace the stereo camera.  [Ref. to EyeSight>Stereo Camera>REMOVAL.](#)

3. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

Is DTC for LAN system displayed?



Yes

Perform the diagnosis of DTCs for LAN system.

No

 [Go to 4.](#)

4. CHECK ECM.

Perform the diagnosis for the engine.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DQ\)>Basic Diagnostic Procedure.](#)  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Basic Diagnostic Procedure.](#)

Is DTC for engine displayed?

Yes

Perform the diagnosis according to DTC.

No

 [Go to 5.](#)

5. CHECK CONNECTOR.

Check the ECM connector and the stereo camera connector.

Is the check result OK?

Yes

 [Go to 6.](#)

No

Repair or replace the connector.

6. CHECK STEREO CAMERA.

Read the DTC.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Code\(s\) Display.](#)


Is DTC other than DTC B28A1 displayed?

Yes



Perform the diagnosis according to DTC.

No

No

 [Go to 7.](#)

7. CHECK STEREO CAMERA.

1. Clear the memory.  [Ref. to EyeSight \(DIAGNOSTICS\)>Clear memory.](#)
2. Read the DTC.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Code\(s\) Display.](#)

Is DTC B28A1 displayed?

Yes

Replace the stereo camera.  [Ref. to EyeSight>Stereo Camera>REMOVAL.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28A2 EYESIGHT COMMUNICATION(VDC)

Detected when the VDC control module (VDCCM) detects the malfunction of stereo camera.


DTC detecting condition:

- Defective CAN system
- Defective VDC control module (VDCCM)
- Defective stereo camera

Trouble symptom:

- All functions of EyeSight system do not operate.
- EyeSight warning light illuminates.

1. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

Is DTC for LAN system displayed?


Yes

Perform the diagnosis of DTCs for LAN system.

No

 [Go to 2.](#)

2. CHECK VDC.

Perform the diagnosis for VDC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is DTC of VDC displayed?

Yes

Perform the diagnosis according to DTC.

No

 [Go to 3.](#)

3. CHECK CONNECTOR.

Check the VDC connector and the stereo camera connector.

Is the check result OK?

 [Go to 4.](#)

Yes

No

Repair or replace the connector.

4. CHECK STEREO CAMERA.



Read the DTC. [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Code\(s\) Display.](#)

Is DTC other than DTC B28A2 displayed?

Yes

Perform the diagnosis for DTC other than DTC B28A2.

No

[Go to 5.](#)

5. CHECK STEREO CAMERA.



1. Clear the memory. [Ref. to EyeSight \(DIAGNOSTICS\)>Clear memory.](#)

2. Read the DTC. [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Code\(s\) Display.](#)

Is DTC B28A2 displayed?

Yes

Replace the stereo camera. [Ref. to EyeSight>Stereo Camera>REMOVAL.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28A3 EYESIGHT COMMUNICATION(METER)

Detected when the combination meter detects the malfunction of stereo camera.

DTC detecting condition:

- Defective CAN system
- Defective combination meter
- Defective stereo camera

Trouble symptom:

- All functions of EyeSight system do not operate.
- EyeSight warning light illuminates.

1. CHECK LAN SYSTEM.


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

Is DTC for LAN system displayed?


Yes

Perform the diagnosis of DTCs for LAN system.

No

 [Go to 2.](#)

2. CHECK COMBINATION METER.

Check the combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is DTC of combination meter displayed?

Yes

Perform the diagnosis for combination meter.

No

 [Go to 3.](#)

3. CHECK CONNECTOR.

Check the combination meter connector and the stereo camera connector.

Is the check result OK?



 [Go to 4.](#)

Yes

No

Repair or replace the connector.

4. CHECK STEREO CAMERA.



Read the DTC.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Code\(s\) Display.](#)

Is DTC other than DTC B28A3 displayed?

Yes

Perform the diagnosis for DTC other than DTC B28A3.

No

 [Go to 5.](#)

5. CHECK STEREO CAMERA.



1. Clear the memory.  [Ref. to EyeSight \(DIAGNOSTICS\)>Clear memory.](#)

2. Read the DTC.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Code\(s\) Display.](#)

Is DTC B28A3 displayed?

Yes

Replace the stereo camera.  [Ref. to EyeSight>Stereo Camera>REMOVAL.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28A4 EYESIGHT COMMUNICATION(EPS)

Detected when the power steering control module (EPS CM) detects the malfunction of stereo camera.


DTC detecting condition:

- Defective CAN system
- Defective EPS CM
- Defective stereo camera

Trouble symptom:

- All functions of EyeSight system do not operate.
- EyeSight warning light illuminates.

1. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

Is DTC for LAN system displayed?


Yes

Perform the diagnosis of DTCs for LAN system.

No

 [Go to 2.](#)

2. CHECK EPS CM.

Perform the diagnosis for the power steering system.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is DTC for power steering system displayed?

Yes

Perform the diagnosis for DTC for the EPS.

No


 [Go to 3.](#)

3. CHECK CONNECTOR.

Check the EPS CM connector and the stereo camera connector.

Is the check result OK?

Yes

 [Go to 4.](#)

No

Repair or replace the connector.

4. CHECK STEREO CAMERA.

Read the DTC.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Code\(s\) Display.](#)

Is DTC other than DTC B28A4 displayed?



Yes

Perform the diagnosis for DTC other than DTC B28A4.

No


 [Go to 5.](#)

5. CHECK STEREO CAMERA.

1. Clear the memory.  [Ref. to EyeSight \(DIAGNOSTICS\)>Clear memory.](#)
2. Read the DTC.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Code\(s\) Display.](#)

Is DTC B28A4 displayed?

Yes

Replace the stereo camera.  [Ref. to EyeSight>Stereo Camera>REMOVAL.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28A5 ENGINE TORQUE LIMITER CONTROL PROHIBIT

Detected when abnormal data is transmitted from stereo camera to engine control module (ECM) and the engine control module (ECM) prohibits the AT rapid start prevention control, or when the engine control module (ECM) prohibits the AT rapid start prevention control.

DTC detecting condition:

- Defective CAN system
- Defective engine control module (ECM)
- Defective stereo camera
- Defective combination meter
- Incorrect assembly of combination meter (when the combination meter that is not for EyeSight is installed.)

Trouble symptom:


- All functions of EyeSight system do not operate.
- EyeSight warning light illuminates.

1. CHECK COMBINATION METER.

Check the part number of the combination meter.

Is the combination meter genuine?


Yes

 [Go to 2.](#)

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

2. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is DTC for LAN system displayed?

Yes

Perform the diagnosis of DTCs for LAN system.

No

 [Go to 3.](#)

3. CHECK ECM.

Perform the diagnosis for the engine. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Basic Diagnostic Procedure>PROCEDURE.](#) [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Basic Diagnostic Procedure.](#)

Is DTC for engine displayed?

Yes

Perform the diagnosis for DTC for the engine.

No

[Go to 4.](#)

4. CHECK CONNECTOR.

Check the ECM connector and the stereo camera connector.

Is the check result OK?

Yes

[Go to 5.](#)

No

Repair or replace the connector.

5. CHECK STEREO CAMERA.

Read the DTC. [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Code\(s\) Display.](#)

Is DTC other than DTC B28A5 displayed?

Yes

Perform the diagnosis for DTC other than DTC B28A5.

No

[Go to 6.](#)

6. CHECK STEREO CAMERA.

1. Clear the memory. [Ref. to EyeSight \(DIAGNOSTICS\)>Clear memory.](#)
2. Read the DTC. [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Code\(s\) Display.](#)

Is DTC B28A5 displayed?

Yes

Replace the stereo camera. [Ref. to EyeSight>Stereo Camera>REMOVAL.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28A6 INTERNAL STEREO CAMERA COMMUNICATION 1

Detected when communication error occurs inside the stereo camera.

DTC detecting condition:


Communication error occurs inside the stereo camera.

Trouble symptom:

All functions of EyeSight system do not operate.

1. CHECK RESTARTING.




1. Turn the ignition switch to OFF.
2. Start the engine.
3. Read the DTC related to the stereo camera using the Subaru Select Monitor.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Code\(s\) Display.](#)

Is DTC B28A6 displayed after restarting the engine?
(When malfunction is detected after restarting the engine, 0 is registered in IG counter.
Other values can be regarded as DTCs detected in the past.)

Yes

Replace the stereo camera.  [Ref. to EyeSight>Stereo Camera>REMOVAL.](#)

No


Clear the memory, in which temporary communication failure occurred, and complete the step.  [Ref. to EyeSight \(DIAGNOSTICS\)>Clear memory.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28A7 STEREO CAMERA RECOGNITION(TARGET)

Detected when error occurs in the communication data inside the control module caused by external factors such as noises.

Note:


If the same DTC is still detected after the engine has restarted, replace the stereo camera.  [Ref. to EyeSight>Stereo Camera>REMOVAL.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28A8 INTERNAL STEREO CAMERA COMMUNICATION 2

Detected when error occurs in the communication data inside the control module caused by external factors such as noises.

Note:


If the same DTC is still detected after the engine has restarted, replace the stereo camera.  [Ref. to EyeSight>Stereo Camera>REMOVAL.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28A9 STEREO CAMERA SYNCHRONIZED RECOGNITION DATA

Detected when error occurs in the communication data inside the control module caused by external factors such as noises.

Note:

If the same DTC is still detected after the engine has restarted, replace the stereo camera.  [Ref. to EyeSight>Stereo Camera>REMOVAL.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28AA STEREO CAMERA MICROCOMPUTER 1


Detected when communication error occurs due to malfunction of microcomputer inside the stereo camera.

DTC detecting condition:

Communication error occurs due to malfunction of microcomputer inside the stereo camera.

Trouble symptom:

All functions of EyeSight system do not operate.

Refer to DTC B28A6 for diagnostic procedure.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B28A6 INTERNAL STEREO CAMERA COMMUNICATION 1.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28AB STEREO CAMERA MICROCOMPUTER 2


Detected when communication error occurs due to malfunction of microcomputer inside the stereo camera.

DTC detecting condition:

Communication error occurs due to malfunction of microcomputer inside the stereo camera.

Trouble symptom:

All functions of EyeSight system do not operate.

Refer to DTC B28A6 for diagnostic procedure.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B28A6 INTERNAL STEREO CAMERA COMMUNICATION 1.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28AC STEREO CAMERA ASIC


Detected when communication error occurs due to malfunction of ASIC.

DTC detecting condition:

Communication error occurs due to malfunction of ASIC.

Trouble symptom:

All functions of EyeSight system do not operate.

Refer to DTC B28A6 for diagnostic procedure.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B28A6 INTERNAL STEREO CAMERA COMMUNICATION 1.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28AD STEREO CAMERA IMAGE RECOGNITION


Detected when improper image recognition occurs in the microcomputer inside the stereo camera.

DTC detecting condition:

Improper image recognition occurs in the microcomputer inside the stereo camera.

Trouble symptom:

All functions of EyeSight system do not operate.

Refer to DTC B28A6 for diagnostic procedure.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B28A6 INTERNAL STEREO CAMERA COMMUNICATION 1.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28AE INTERNAL STEREO CAMERA POWER SUPPLY


Detected when improper power supply inside the stereo camera occurs.

DTC detecting condition:

Improper power supply inside the stereo camera occurs.

Trouble symptom:

All functions of EyeSight system do not operate.

Refer to DTC B28A6 for diagnostic procedure.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B28A6 INTERNAL STEREO CAMERA COMMUNICATION 1.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28AF STEREO CAMERA ADJUSTMENT INCOMPLETE


Detected when adjustment or inspection of stereo camera has not been completed normally.

DTC detecting condition:

- Operation is aborted during adjustment or inspection of the stereo camera.
- After the replacement of the stereo camera, adjustment or inspection of camera has not yet been performed.

Trouble symptom:

All functions of EyeSight system do not operate.

For diagnostic procedure, perform adjustment/inspection of camera. When the adjustment or inspection of camera is performed, and if it is not completed successfully, replace the camera. 

[Ref. to EyeSight>Stereo Camera.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28B1 STEREO CAMERA AUTOMATIC ADJUSTMENT

Detected when the optical axis of stereo camera is deviated in lateral direction or when the fluctuation range of automatic adjustment value has expanded.

Note:

Readjust the stereo camera.  **Ref. to EyeSight>Camera Adjustment, Inspection.**

If the same DTC is still detected after readjustment, replace the stereo camera. 


Ref. to EyeSight>Stereo Camera>REMOVAL.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28B2 STEREO CAMERA HIGH TEMPERATURE

Detected when the temperature of the stereo camera excessively increases.

Note:

When this DTC is detected, performing adjustment or inspection of the camera will not return to the normal state. In this case, always replace the stereo camera. 


[Ref. to EyeSight>Stereo Camera>REMOVAL.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28B3 STEREO CAMERA LOW TEMPERATURE

Detected when the temperature of the stereo camera excessively decreases.

Note:

When this DTC is detected, performing adjustment or inspection of the camera will not return to the normal state. In this case, always replace the stereo camera. 


[Ref. to EyeSight>Stereo Camera>REMOVAL.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28B5 +B CIRCUIT OPEN

Detected when there is an open circuit in power supply line.

Note:

Refer to DTC B2814 for diagnostic procedure.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2814 POWER SUPPLY LOW VOLTAGE.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28B6 PRE-COLLISION OFF SWITCH

Detected when pre-collision brake OFF switch circuit is not installed, open-circuited or is stuck to ON.

DTC detecting condition:

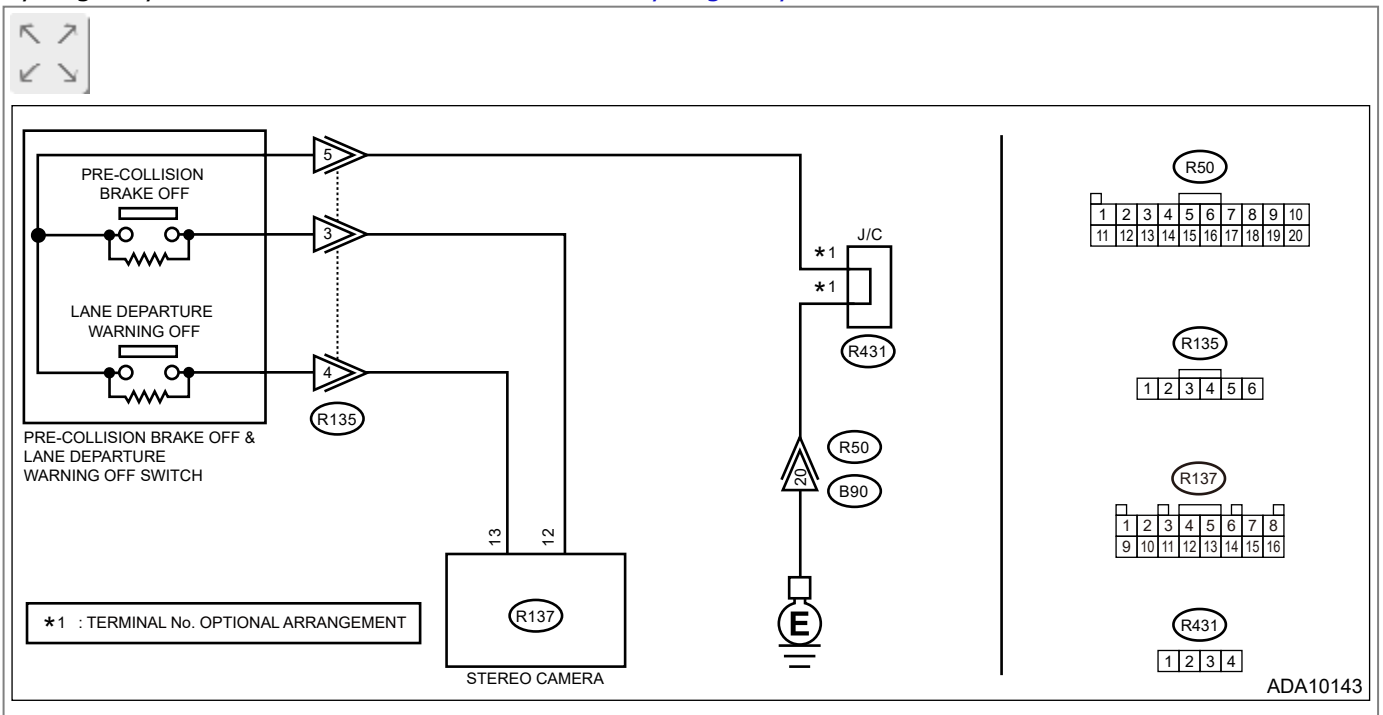
- Wiring of pre-collision brake OFF switch is not connected.
- Pre-collision brake OFF switch circuit is open.
- Pre-collision brake OFF switch circuit stays ON for 45 seconds or more.

Trouble symptom:


All functions of EyeSight system do not operate.

Wiring diagram:

EyeSight system  [Ref. to WIRING SYSTEM>EyeSight System>WIRING DIAGRAM.](#)



1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, confirm the data monitor display of [Pre-Collision Brake OFF SW Status (BIU)] of EyeSight.  [Ref. to EyeSight \(DIAGNOSTICS\)>Data Monitor.](#)

Does the display change according to ON/OFF operation of the pre-collision brake OFF switch?


Yes

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

 [Go to 2.](#)

2. CHECK HARNESS (OPEN CIRCUIT).



1. Disconnect the stereo camera connector and the pre-collision brake OFF switch connector.
2. Using the tester, measure the resistance between the stereo camera connector and pre-collision brake OFF switch connector as well as chassis ground.


Connector & terminal

(R137) No. 12 — (R135) No. 3:

(R135) No. 5 — Chassis ground:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair or replace an open circuit in harness between the stereo camera connector and pre-collision brake OFF switch connector.

3. CHECK HARNESS (OPEN CIRCUIT).




Using the tester, measure the resistance between the pre-collision brake OFF switch connector and chassis ground.

Connector & terminal

(R135) No. 3 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

Check the pre-collision brake OFF switch.  [Ref. to EyeSight>Switches and Harness>INSPECTION.](#)

No

Repair or replace the short circuit to ground in harness between the stereo camera connector and pre-collision brake OFF switch connector.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28B7 LDP OFF SWITCH

Detected when lane departure warning OFF switch circuit is not installed, open-circuited, or is stuck to ON.

DTC detecting condition:

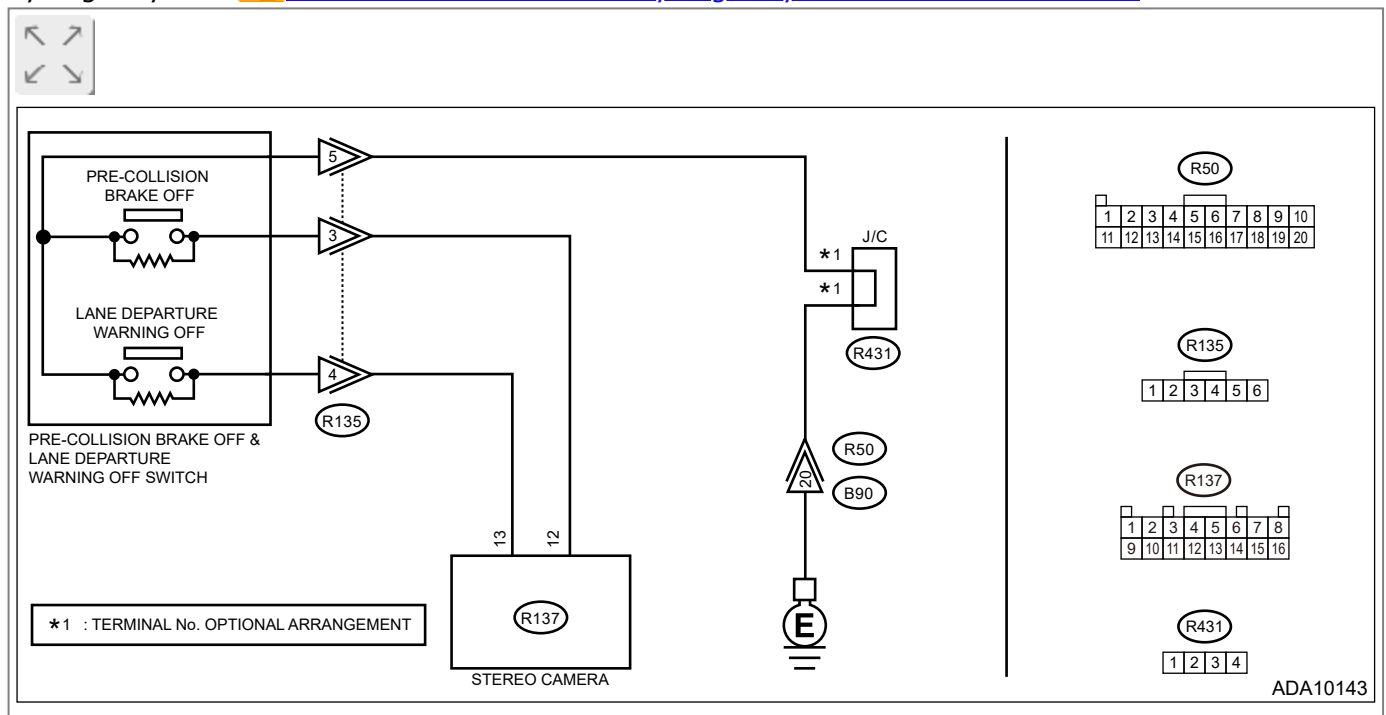
- Wiring of lane departure warning OFF switch is not connected.
- Lane departure warning OFF switch circuit is open.
- Lane departure warning OFF switch circuit stays ON for 45 seconds or more.

Trouble symptom:

All functions of EyeSight system do not operate.

Wiring diagram:

EyeSight system [Ref. to WIRING SYSTEM>EyeSight System>WIRING DIAGRAM.](#)



1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, confirm the data monitor display of [Lane Departure OFF SW (BIU)] of EyeSight. [Ref. to EyeSight \(DIAGNOSTICS\)>Data Monitor.](#)

Does the display change according to the lane departure warning OFF switch ON/OFF operation?

Yes

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

 [Go to 2.](#)

2. CHECK HARNESS (OPEN CIRCUIT).



1. Disconnect the stereo camera connector and the lane departure warning OFF switch connector.
2. Using the tester, measure the resistance between the stereo camera connector and lane departure warning OFF switch connector.

Connector & terminal

(R137) No. 13 — (R135) No. 4:

(R135) No. 5 — Chassis ground:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair or replace an open circuit in harness between the stereo camera connector and lane departure warning OFF switch connector.

3. CHECK HARNESS (OPEN CIRCUIT).




Using the tester, measure the resistance between the lane departure warning OFF switch connector and chassis ground.

Connector & terminal

(R135) No. 3 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

Check the lane departure warning OFF switch.  [Ref. to EyeSight>Switches and Harness>INSPECTION.](#)

No

Repair or replace the short circuit to ground in harness between the stereo camera connector and lane departure warning OFF switch connector.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28B8 EYESIGHT SWITCH 1 ABNORMAL

Detected when steering switch for EyeSight is not installed, is open-circuited or is stuck to ON.

DTC detecting condition:

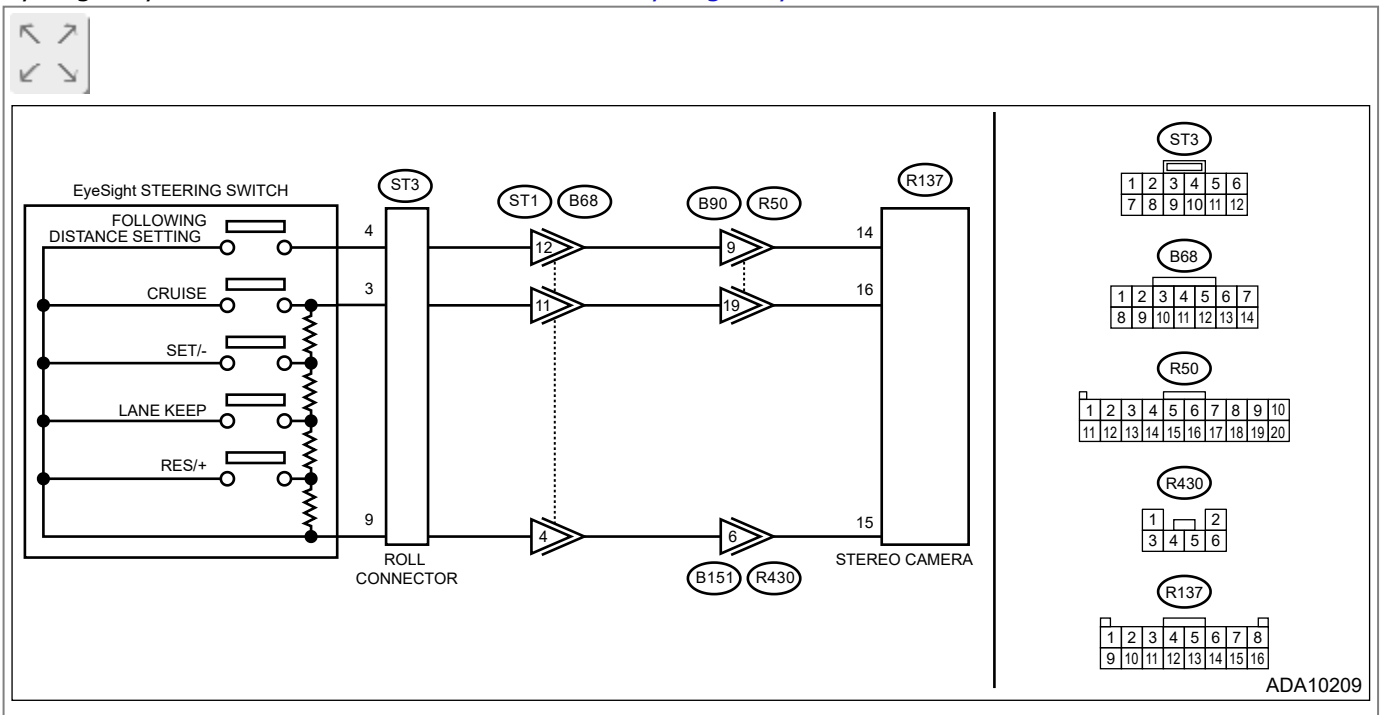
- Wiring of the EyeSight steering switch is not connected.
- EyeSight steering switch circuit is open.
- EyeSight steering switch circuit stays ON.

Trouble symptom:


All functions of EyeSight system do not operate.

Wiring diagram:

EyeSight system  [Ref. to WIRING SYSTEM>EyeSight System>WIRING DIAGRAM.](#)



1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the data monitor display of [Cruise Control SW Voltage (Port14)], and [Cruise Control SW Voltage (Port16)].  [Ref. to EyeSight \(DIAGNOSTICS\)>Data Monitor.](#)

Is the voltage according to the pressed EyeSight steering switch displayed?


Yes

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

 [Go to 2.](#)

2. CHECK HARNESS (OPEN CIRCUIT).



1. Disconnect the stereo camera connector and EyeSight steering switch connector.
2. Using the tester, measure the resistance between stereo camera connector and EyeSight steering switch connector.

Connector & terminal


(ST3) No. 4 – (R137) No. 14:

(ST3) No. 3 – (R137) No. 16:

(ST3) No. 9 – (R137) No. 15:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair or replace an open circuit in harness between the stereo camera connector and the EyeSight steering switch connector.

3. CHECK HARNESS (GROUND SHORT CIRCUIT).



Using the tester, measure the resistance between EyeSight steering switch connector and chassis ground.

Connector & terminal


(ST3) No. 4 – Chassis ground:

(ST3) No. 3 – Chassis ground:

(ST3) No. 9 – Chassis ground:

Is the resistance 1 M Ω or more?

Yes


Check the EyeSight steering switch.  [Ref. to EyeSight>Switches and Harness>INSPECTION.](#)

No

Repair or replace the short circuit to ground in harness between the stereo camera connector and the EyeSight steering switch connector.

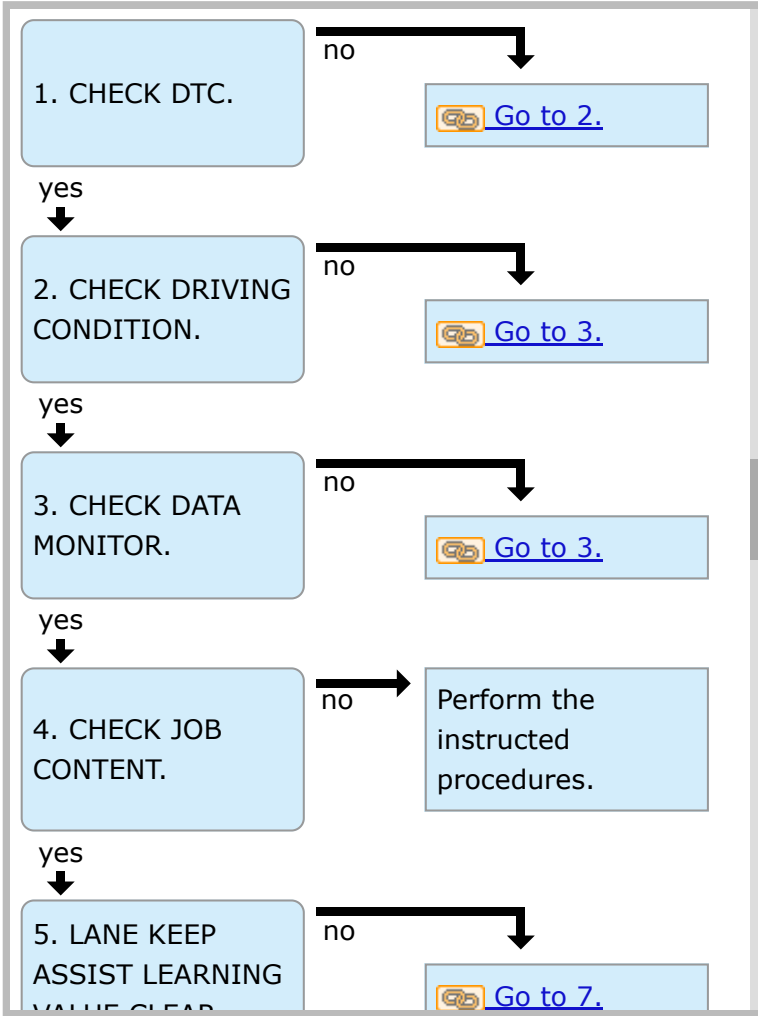
EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28B9 EYESIGHT STEERING SWITCH 2

Detected when steering switch for EyeSight is not installed, is open-circuited or is stuck to ON.
Refer to DTC B28B8 for diagnostic procedure.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B28B8 EyeSight SWITCH 1 ABNORMAL.](#)

DTC B28BA STEERING ANGLE AND STEREO CAMERA CORRELATION MISALIGNED

CAUTION/NOTE INTRO



Note:

- Prior confirmation is required to work related to alignment has been performed or there is an accident.
- Using the Subaru Select Monitor, check the value of data monitor of stereo camera [Active Lane Keep System Control Value 3 (Steering Wheel Angles advance). [Ref. to EyeSight \(DIAGNOSTICS\)>Data Monitor.](#)


START

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

Detected when malfunction occurs in CAN line. (Bus off)

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

Detected when CAN data from engine control module (ECM) is not transmitted to stereo camera.

Note:

Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)


EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM

Detected when CAN data from TCM is not transmitted to stereo camera.

When lost communication with TCM and TCM abnormal occur simultaneously, perform diagnosis for lost communication with TCM first.

Note:

Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)


EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

Detected when CAN data from VDC is not transmitted to stereo camera.

When lost communication with vehicle dynamics control and vehicle dynamics control module abnormal or VDC echo back disagreement occur simultaneously, perform diagnosis for lost communication with vehicle dynamics control first.

Note:


Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0126 LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE

Detected when CAN data from steering angle sensor is not transmitted to stereo camera.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0131 LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE

Detected when CAN data from EPS CM is not transmitted to stereo camera.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE

Detected when CAN data from body integrated unit is not transmitted to stereo camera.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

**DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC)
CONTROL MODULE**

Detected when CAN data from combination meter is not transmitted to stereo camera.

Note:

Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM
\(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"

Failure counter diagnosis of engine control module (ECM)

Note:

Perform check of the ECM.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Basic Diagnostic Procedure>PROCEDURE.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0402 INVALID DATA RECEIVED FROM TCM

Failure counter diagnosis of automatic transmission control module (TCM)

Note:

Check the automatic transmission.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

Failure counter diagnosis of VDC control module (VDC CM)

Note:

Check the VDC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0420 INVALID DATA RECEIVED FROM POWER STEERING CONTROL MODULE

Failure counter diagnosis of EPS CM

Note:

Perform the diagnosis for EPS.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE

Failure counter diagnosis of body integrated unit

Note:

Inspect the body integrated unit.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
**DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL
MODULE**

Failure counter diagnosis of combination meter

Note:

**Check the combination meter.  [Ref. to COMBINATION METER
\(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)**

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0428 INVALID DATA RECEIVED FROM STEERING ANGLE SENSOR MODULE

Failure counter diagnosis of steering angle sensor

Note:


Perform the diagnosis for steering angle sensor.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1073 CONTROL MODULE COMMUNICATION BUS "SONAR-CAN" OFF

Detected when the bus off status (the stereo camera detects the failure and is disconnected from the local CAN line) occurs.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1233 LOST COMMUNICATION WITH RAB CONTROL MODULE

Detected when CAN data from RAB CM did not reach the stereo camera.

Note:

Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1534 INVALID DATA RECEIVED FROM SONAR ECU

Failure counter diagnosis of RAB CM.

Note:

Check RAB CM.  **[Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)**

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code


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When CRUISE switch is pressed, or a malfunction related to CRUISE switch occurs, this is detected.

Trouble symptom:

- Cruise control cannot be set. (Cancelled immediately.)
- Cruise control cannot be released.

Note:

Refer to DTC B28B8 for diagnostic procedure.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B28B8 EyeSight SWITCH 1 ABNORMAL.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

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Detected when the brake pedal is depressed, or the error related to the stop light & brake switch occurred.

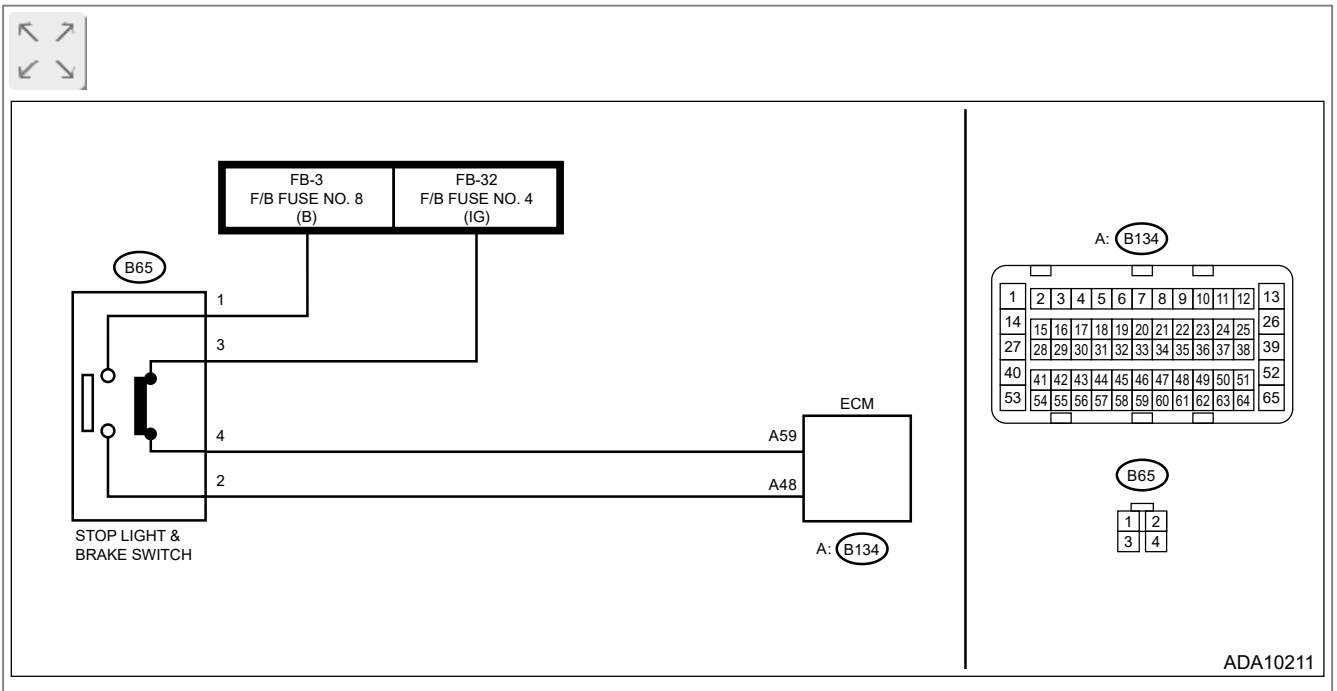
Trouble symptom:

- Cruise control cannot be set.
- Cruise control cannot be released.

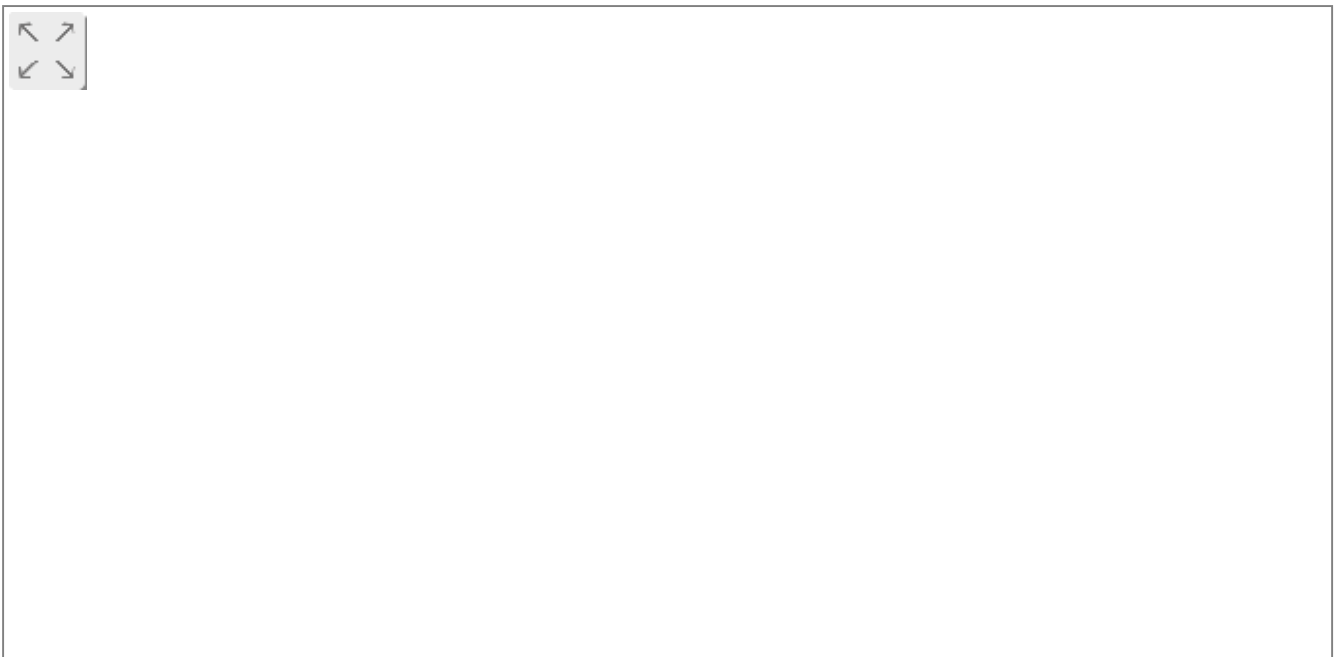
Wiring diagram:

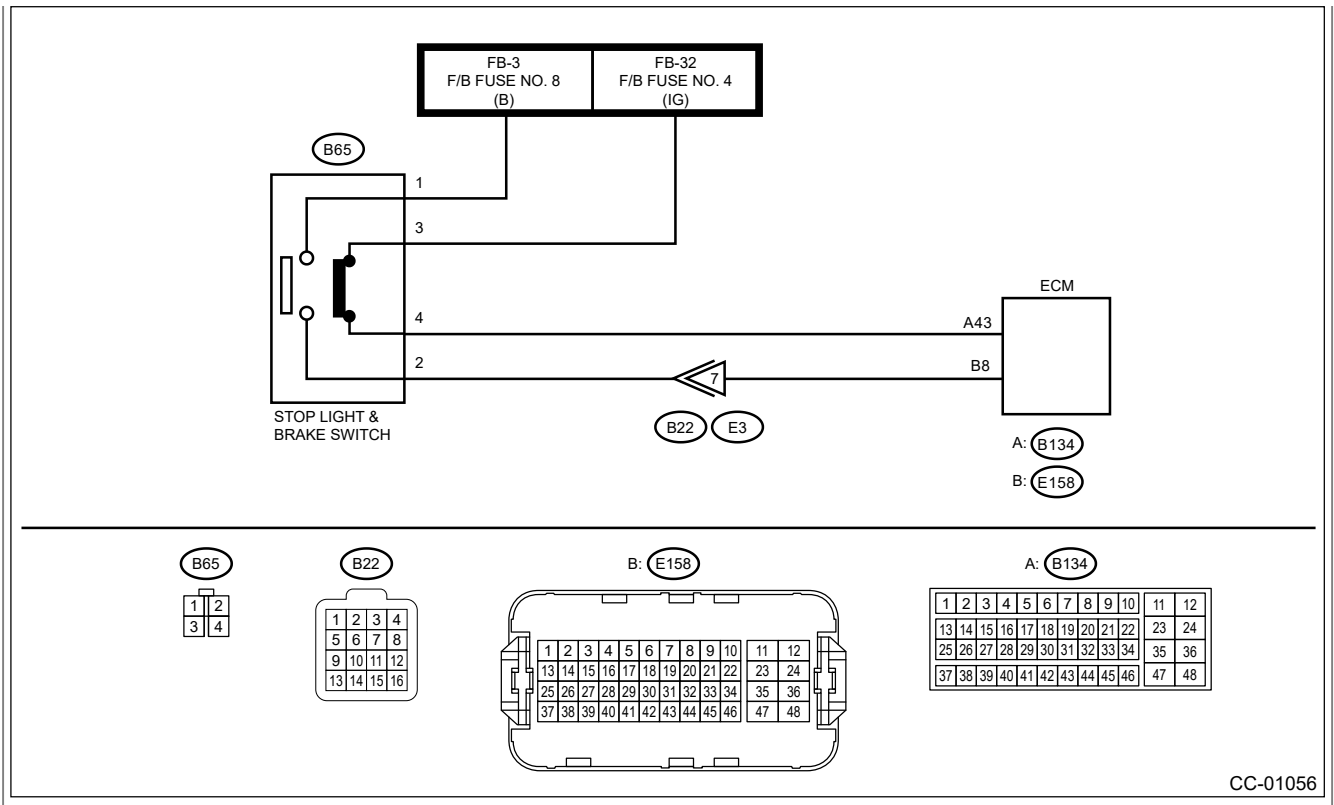
EyeSight system  [Ref. to WIRING SYSTEM>EyeSight System.](#)

- Non-turbo model



- Turbo model





1. CHECK STOP LIGHT & BRAKE SWITCH. ▶

Check the stop light & brake switch. [Ref. to CRUISE CONTROL SYSTEM>Stop Light & Brake Switch.](#)

Is the stop light & brake switch and installation position OK?

[Go to 2.](#)

Replace the stop light & brake switch. Or adjust the installation position.

2. CHECK STOP LIGHT & BRAKE SWITCH CIRCUIT. ▶

1. Turn the ignition switch to OFF.
2. Disconnect the stop light & brake switch harness connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between harness connector terminal and chassis ground.

Connector & terminal

(B65) No. 1 (+) — Chassis ground (-):

Is the voltage 10 V or more?

[Go to 3.](#)

No

- Check fuse No. 8 (in fuse & relay box).
- Check for open or short circuit in harness between the stop light & brake switch and the fuse & relay box.

3. CHECK STOP LIGHT & BRAKE SWITCH CIRCUIT.



Measure the voltage between harness connector terminal and chassis ground.

Connector & terminal

(B65) No. 3 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

[Go to 4.](#)

No

- Check fuse No. 4 (in fuse & relay box).
- Check for open or short circuit in harness between the stop light & brake switch and the fuse & relay box.

4. CHECK STOP LIGHT & BRAKE SWITCH CIRCUIT.



1. Turn the ignition switch to OFF.
2. Disconnect the harness connector of ECM.
3. Measure the resistance between ECM harness connector terminal and stop light & brake switch harness connector terminal.

Connector & terminal

Non-turbo model

(B134) No. 59 — (B65) No. 4:

(B134) No. 48 — (B65) No. 2:

Turbo model

(E158) No. 8 — (B65) No. 2:

(B134) No. 43 — (B65) No. 4:

Is the resistance less than 10 Ω ?

Yes

Replace the ECM.

[Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#) [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)

No

Repair the harness.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

14

Detected when the select lever is shifted to the neutral position, or when an error related to the neutral position switch occurs.

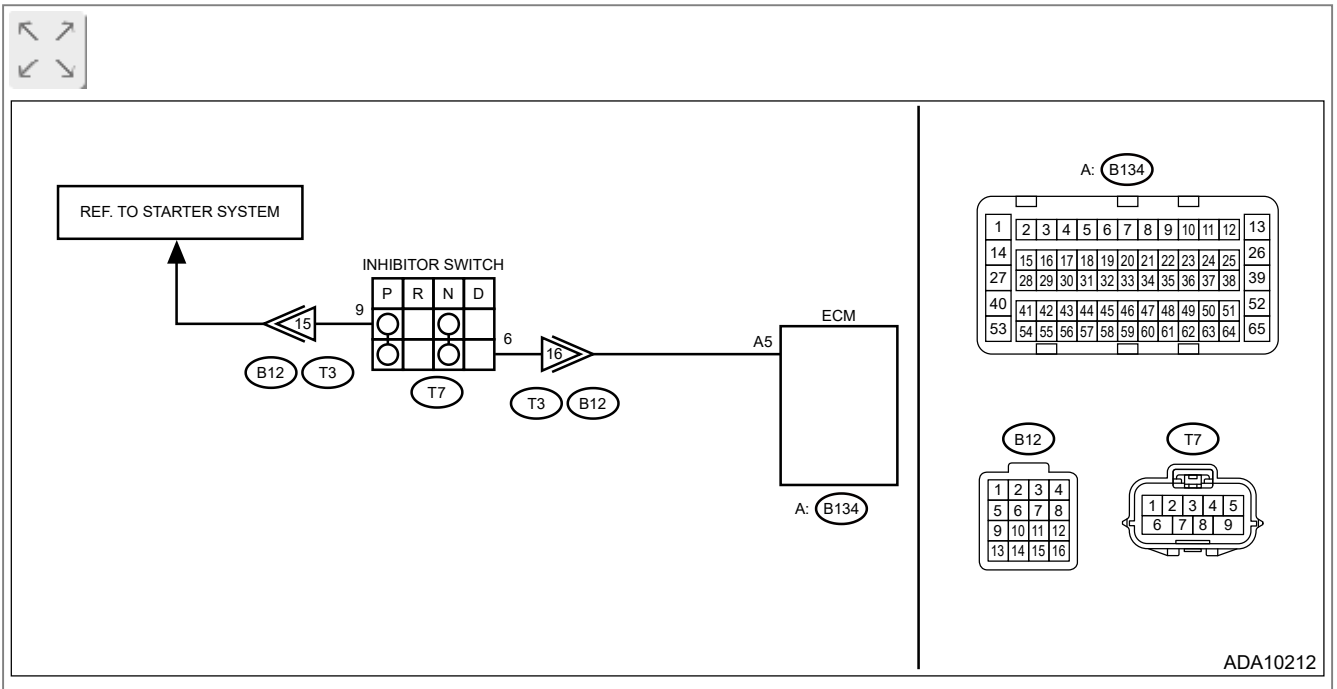
Trouble symptom:

Cruise control cannot be set.

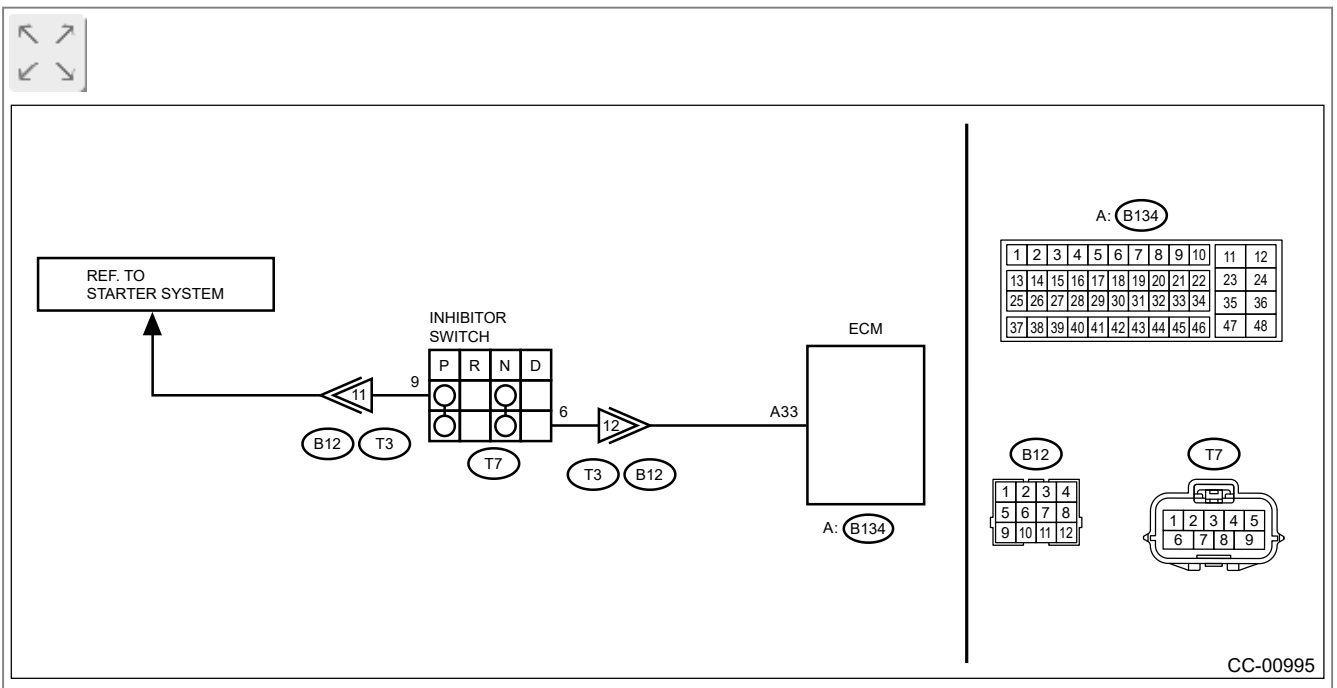
Wiring diagram:

EyeSight system  [Ref. to WIRING SYSTEM>EyeSight System.](#)

- Non-turbo model



- Turbo model



1. CHECK INHIBITOR SWITCH CIRCUIT.



1. Turn the ignition switch to OFF.
2. Disconnect the inhibitor switch harness connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between harness connector terminal and chassis ground.

Connector & terminal

(T7) No. 6 (+) – Chassis ground (-):

Is the voltage 10 V or more?

Yes

[Go to 2.](#)

No

Check for open or short circuit in the harness between inhibitor switch and ECM.

2. CHECK INHIBITOR SWITCH CIRCUIT.



1. Turn the ignition switch to OFF.
2. Disconnect the starter motor harness connector.
3. Measure the resistance between the inhibitor switch harness connector terminal and the starter motor.

Connector & terminal

(T7) No. 9 – Starter motor:

Is the resistance less than 10 Ω ?

Yes

[Go to 3.](#)

No

Repair the harness.

3. CHECK INHIBITOR SWITCH.



Remove and check the inhibitor switch. [Ref. to CRUISE CONTROL SYSTEM>Inhibitor Switch.](#)

Is the inhibitor switch working normal?

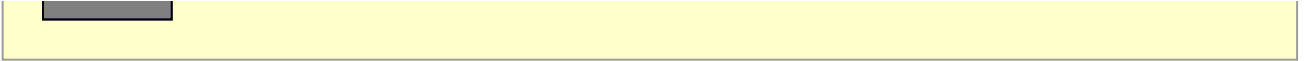
Yes

Replace the ECM.

[Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#) [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)

No

Replace the inhibitor switch.



EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code


15

Detected when CANCEL switch is pressed or malfunction related to CRUISE switch occurs.

Trouble symptom:

- Cruise control cannot be set. (Cancelled immediately.)
- Cruise control cannot be released.

Note:

Refer to DTC B28B8 for diagnostic procedure.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B8 EyeSight SWITCH 1 ABNORMAL.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

16

Detected when ignition switch is turned to OFF or malfunction related to the ignition switch occurs.

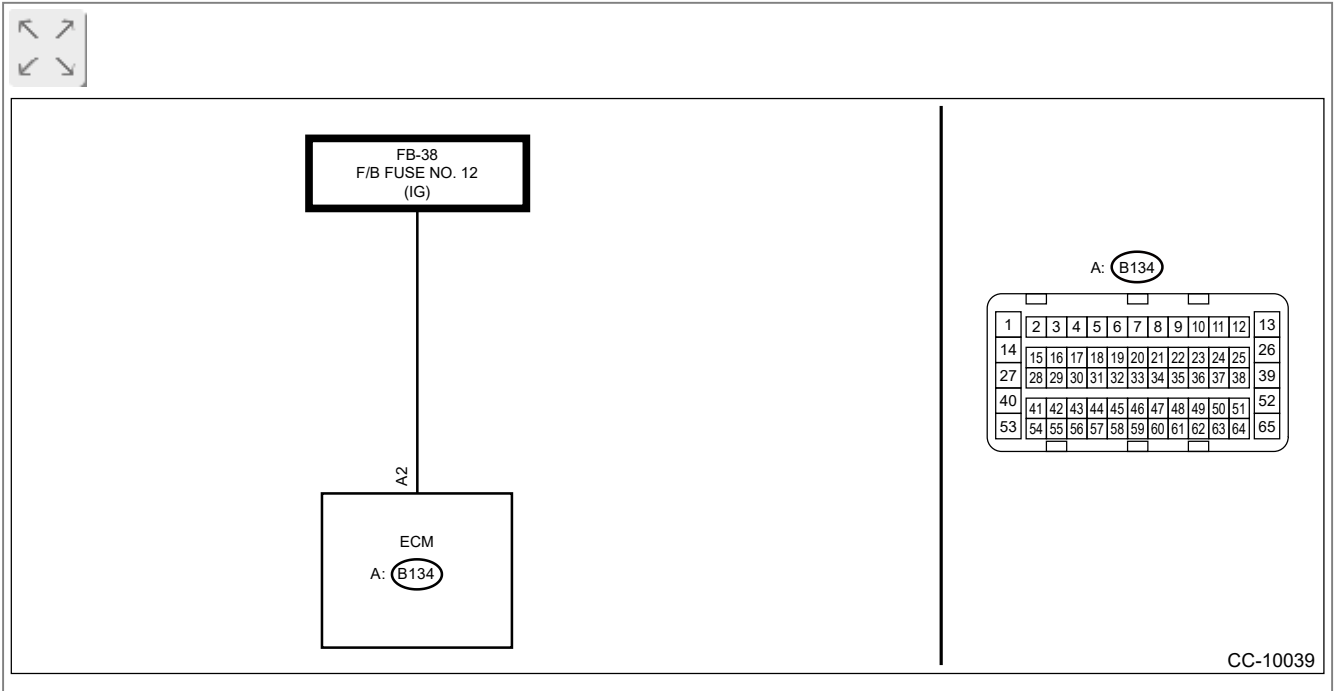
Trouble symptom:

Cruise control cannot be set.

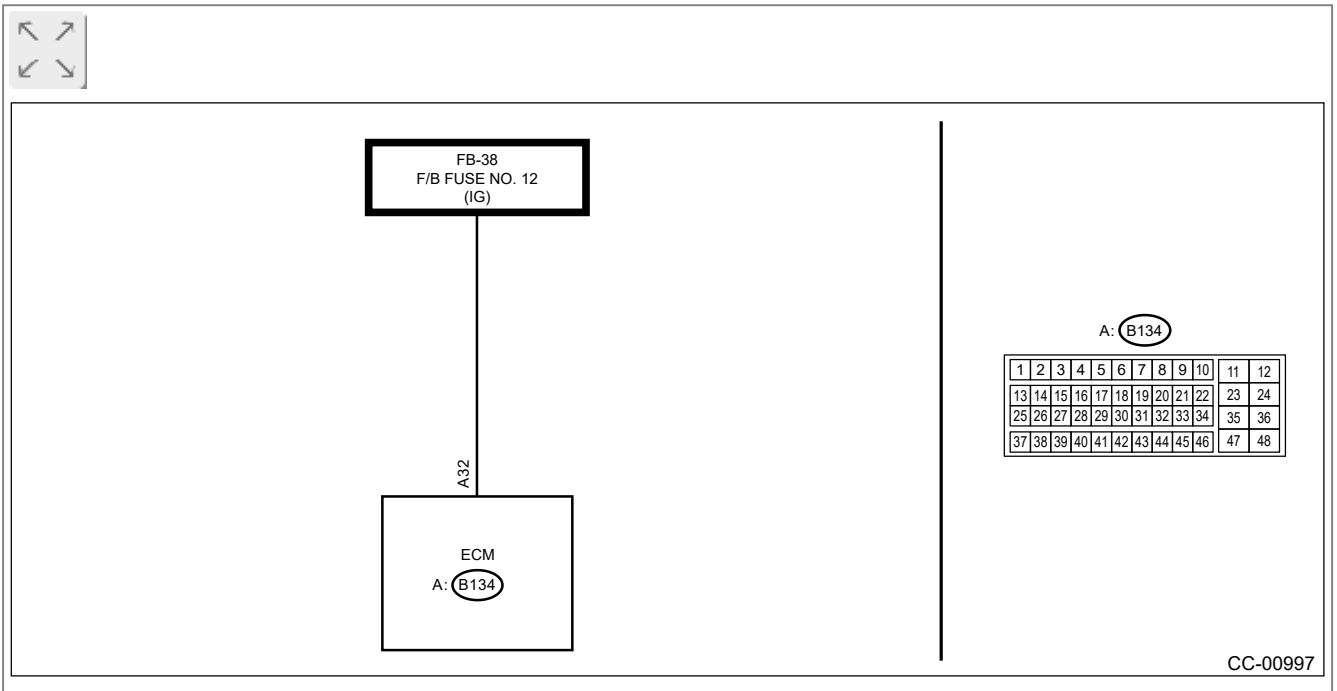
Wiring diagram:

EyeSight system  Ref. to WIRING SYSTEM>EyeSight System.

- Non-turbo model



- Turbo model



1. CHECK IGNITION SWITCH CIRCUIT.



1. Turn the ignition switch to OFF.
2. Disconnect the ECM harness connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between harness connector terminal and chassis ground.

Connector & terminal

Non-turbo model

(B134) No. 2 (+) — Chassis ground (-):

Turbo model

(B134) No. 32 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Check for poor contact of ECM connector.

No

- Check fuse No. 12 (in fuse & relay box).
- Check the harness for open or short circuit between ignition switch and ECM.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code


21

Cruise control command switch malfunction is detected.

Trouble symptom:

- Cruise control cannot be set. (Cancelled immediately.)
- Cruise control cannot be released.

Note:

Refer to DTC B28B8 for diagnostic procedure.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B8 EyeSight SWITCH 1 ABNORMAL.

Malfunction related to vehicle speed sensor is detected.

Diagnosis:

Open or short circuit in the vehicle speed sensor system.

Trouble symptom:

Cruise control cannot be set. (Cancelled immediately.)

1. CHECK ABS OR VDC WARNING LIGHT.



1. Turn the ignition switch to ON.
2. After the initial operation of the combination meter finished, check if the ABS or VDC warning light stays illuminated.

Does the warning light stay illuminated?

Yes

Check the VDCCM.

[Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No

[Go to 2.](#)

2. CHECK DTC OF LAN COMMUNICATION CIRCUIT.



Read the DTC of body integrated unit using Subaru Select Monitor. [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC displayed?

Yes

Perform the diagnosis for the displayed DTCs. [Ref. to BODY CONTROL\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Replace the ECM.

[Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DQ\)>Engine Control Module \(ECM\).](#) [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code


24

Malfunction in cruise control-related switch is detected.

Trouble symptom:

- Cruise control cannot be set. (Cancelled immediately.)
- Cruise control cannot be released.

Note:

Refer to DTC B28B8 for diagnostic procedure.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B8 EyeSight SWITCH 1 ABNORMAL.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

31

Engine speed signal malfunction is detected.

Abnormal increase of engine speed is detected.

Gear is placed in 1st or Reverse position.

System entered X MODE.

After canceling X MODE, drive the vehicle at the 2nd gear position or higher and perform the cruise setting again. If a cancel code is not detected, it is normal.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

32

Detected when the vehicle speed is out of the system controllable range.

Increase vehicle speed high enough to allow the cruise control to function, and then perform setting operation again.

If cancel code is still detected after setting cruise again, perform the diagnosis for DTC 22.

Refer to 22 for diagnostic procedure.

 [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Procedure with ECU Cancel Code>22.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

34

The vehicle has been driven at a speed higher than set speed for a long time (approximately 10 minutes) during cruise driving.

This cancel code is detected when driving for a long period of time at a speed higher than appropriate for cruise control setting by operating the accelerator pedal.

Perform the cruise control setting operation again. If the cancel code is not detected, it is normal.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

35

Detected when it is impossible to perform the vehicle speed feedback.

Set vehicle speed cannot be kept for some reasons (steep uphill, unreleased parking brake, etc.) during cruise driving.

Cancel code is detected when driving condition is not suitable for cruise control.

Perform cruise set operation again after clearing the possible cause.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

41


VDC/TCS/EPB is operated.

Vehicle dynamics control (VDC) or TCS/EPB is operated during cruise driving or cruise setting.

 [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code


43

- The situation that some or all functions for ABS/VDC can not work is detected.
During cruise driving or cruise setting, the situation that some or all functions for ABS/VDC can not work is detected.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)
- CRUISE indicator does not illuminate even though you pressed the CRUISE switch before starting the engine.
Detected when the CRUISE switch is pressed during the initial diagnosis of ABS/VDC. It is normal if the CRUISE indicator illuminates when you press the CRUISE switch again after starting the engine and confirming that the initial illumination of the ABS/VDC warning light has been ended.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

44


Body integrated unit malfunction is detected.

Body integrated unit system malfunction is detected during cruise driving or cruise setting.  [Ref.](#)
[to BODY CONTROL\(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

45


Combination meter malfunction is detected.

Combination meter malfunction is detected during cruise driving or cruise setting.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

49

Automatic transmission malfunction is detected.

Automatic transmission malfunction is detected during cruise driving or cruise control setting. 

[Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Procedure with ECU Cancel Code>49.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

61

Malfunction in the stop light & brake switch is detected.

Trouble symptom:

- Cruise control cannot be set.
- Cruise control cannot be released.

Refer to 12 for diagnostic procedure.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Procedure with ECU Cancel Code>12.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

62

Neutral position switch malfunction is detected.

Trouble symptom:

Cruise control cannot be set.

Refer to 14 for diagnostic procedure.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Procedure with ECU Cancel Code>14.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

63

Malfunction of vehicle speed signal variation is detected.

Trouble symptom:

Cruise control cannot be set. (Cancelled immediately.)

Refer to 22 for diagnostic procedure.  [Ref. to EyeSight \(DIAGNOSTICS\)>Diagnostic Procedure with ECU Cancel Code>22.](#)

Note:



This cancel code may be detected when the vehicle suddenly started with VDC OFF on low μ road surface. In this case, restart the engine and perform the cruise control setting operation again. If the cancel code is not detected, it is normal.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

64

Malfunction related to engine is detected.

Refer to the Engine Diagnostic Procedure for diagnostic procedure.

 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Basic Diagnostic Procedure>PROCEDURE.](#)  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Basic Diagnostic Procedure>PROCEDURE.](#)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

65


Cruise control command switch malfunction is detected.

While the command switch is pressed ON for a long time (approximately two minutes), stuck ON condition is detected.

Trouble symptom:

- Cruise control cannot be set. (Cancelled immediately.)
- Cruise control cannot be released.

Note:



Refer to DTC B28B8 for diagnostic procedure.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B8 EyeSight SWITCH 1 ABNORMAL.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

66

Cruise control calculation malfunction is detected.

Refer to the Engine Diagnostic Procedure for diagnostic procedure.

 [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Basic Diagnostic Procedure>PROCEDURE.](#)  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Basic Diagnostic Procedure>PROCEDURE.](#)

EyeSight (DIAGNOSTICS) > Diagnostics with Phenomenon

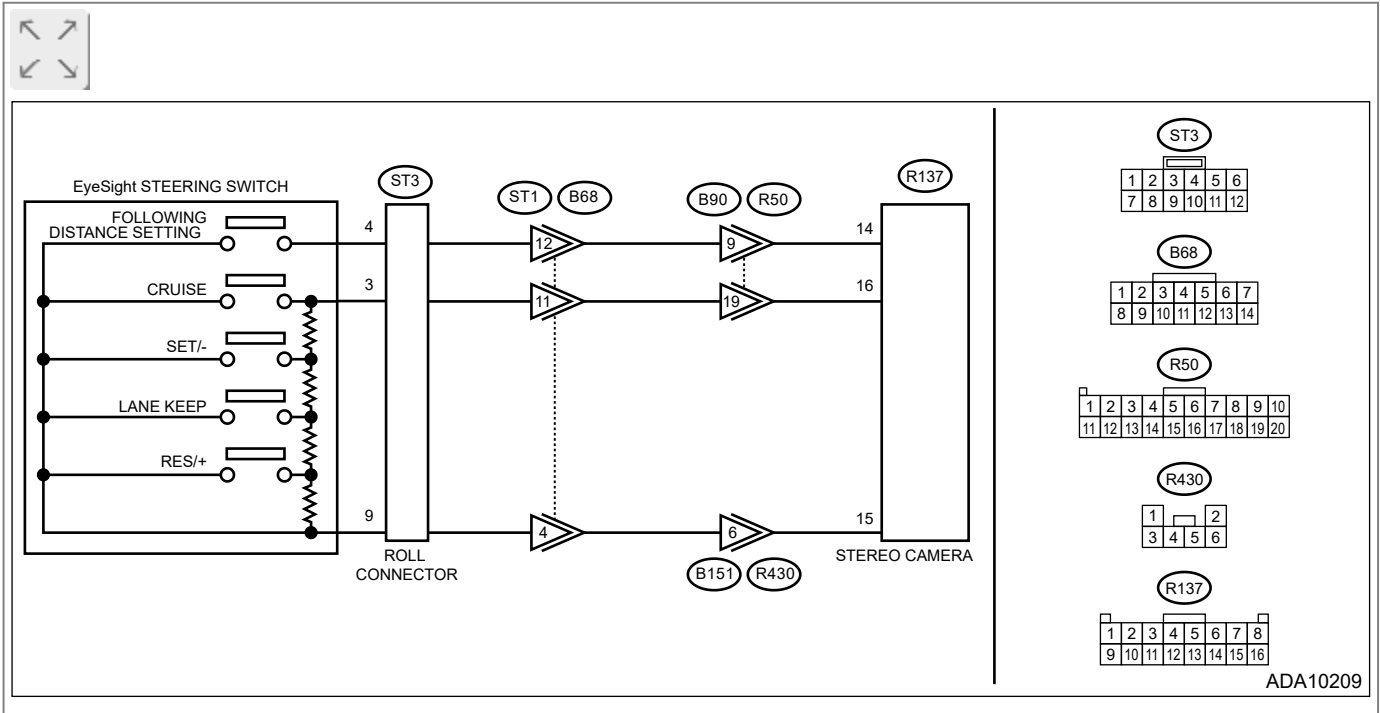
CHECK EYESIGHT STEERING SWITCH

Trouble symptom:


- Cruise control cannot be set. (Cancelled immediately.)
- Cruise control cannot be released.

Wiring diagram:

EyeSight system  [Ref. to WIRING SYSTEM>EyeSight System>WIRING DIAGRAM.](#)



1. CHECK EyeSight STEERING SWITCH CIRCUIT.


1. Remove the driver's airbag module.  [Ref. to AIRBAG SYSTEM>Driver's Airbag Module>REMOVAL.](#)
2. Disconnect the EyeSight steering switch connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between EyeSight steering switch connector and chassis ground.

Connector & terminal

- (ST3) No. 3 (+) — Chassis ground (-):
- (ST3) No. 4 (+) — Chassis ground (-):

Is the voltage 5 V or more?

Yes

 [Go to 2.](#)

No

Check for open/short circuit or poor contact in the harness between EyeSight steering switch and stereo camera and in the steering roll connector.

2. CHECK EyeSight STEERING SWITCH CIRCUIT.



1. Turn the ignition switch to OFF.
2. Remove the EyeSight steering switch. [Ref. to EyeSight>Switches and Harness.](#)
3. Measure the resistance between EyeSight steering switch connector and stereo camera connector.

Connector & terminal

(ST3) No. 9 – (R137) No. 15:

Is the resistance less than 10 Ω ?

Yes

[Go to 3.](#)

No

Check for open circuit between EyeSight steering switch connector and stereo camera connector.

3. CHECK EyeSight STEERING SWITCH.



Check EyeSight steering switch. [Ref. to EyeSight>Switches and Harness.](#)

Is the check result OK?

Yes

Replace the stereo camera. [Ref. to EyeSight>Stereo Camera.](#)

No

Replace the EyeSight steering switch. [Ref. to EyeSight>Switches and Harness.](#)













DIAGNOSTIC PROCEDURE WITH PHENOMENON











1. TEMPORARY STOP OF EyeSight





Phenomenon		Check Item	Note
1	Temporary stop occurs frequently. EyeSight temporary stop indicator illuminates frequently.	(1) Check EyeSight temporary stop code. 🔗 Ref. to EyeSight (DIAGNOSTICS)>EyeSight Temporary Code(s) Display.	For details on temporary stop codes, refer to CHECK LIST (CAMERA TEMPORARY STOP). Check list (camera temporary stop) 🔗 Ref. to EyeSight (DIAGNOSTICS)>EyeSight Temporary Code(s) Display>LIST > CHECK LIST (CAMERA TEMPORARY STOP). When there is a relevant item in the check list, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved. If not solved, the stereo camera may be malfunctioning.



2. ADAPTIVE CRUISE CONTROL, CONVENTIONAL CRUISE CONTROL

Phenomenon		Check Item	Note
1	Cruise control main switch is not turned to ON. (CRUISE indicator light does not illuminate.) Or cruise control is cancelled without operating the cruise control command switch.	(1) Check the ECM cruise control cancel code.	Perform the diagnosis according to displayed cancel code. 🔗 Ref. to EyeSight (DIAGNOSTICS)>ECM Cancel Code(s) Display. If not displayed, go to (2).
		(2) Perform the real-time diagnosis. Check the input signal of cruise control system.	Real-time Diagnosis 🔗 Ref. to EyeSight (DIAGNOSTICS)>Real-time Diagnosis. When normal, go to (4). When abnormal, go to (3).
		(3) Check the EyeSight steering switch.	Check EyeSight steering switch 🔗 Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>CHECK EyeSight STEERING SWITCH.
		(4) Check the CRUISE indicator.	CHECK CRUISE INDICATOR LIGHT. 🔗 Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>CHECK ADAPTIVE CRUISE CONTROL INDICATOR LIGHT/CONSTANT SPEED CRUISE CONTROL INDICATOR LIGHT AND CRUISE SET INDICATOR LIGHT.
2	Cruise control cannot be set.	(1) Check the ECM cruise control cancel code.	Perform the diagnosis according to displayed cancel code. 🔗 Ref. to EyeSight


	Or cruise control is cancelled without releasing operation. Note: <ul style="list-style-type: none"> • Do not turn the ignition switch to OFF after the cruise control is deactivated. • Do not operate the EyeSight steering switch after the cruise control is deactivated. If the above is performed, the cancel code the ECM will be cleared.		<p>(DIAGNOSTICS)>ECM Cancel Code(s) Display. If not displayed, go to (2).</p> <p>(2) Perform the real-time diagnosis. Check the input signal of cruise control system.</p> <p>(3) Check the EyeSight steering switch.</p> <p>(4) Check stop light switch and brake switch.</p> <p>(5) Check the neutral position switch.</p> <p>(6) Check vehicle speed sensor.</p>	<p>Real-time Diagnosis  Ref. to EyeSight (DIAGNOSTICS)>Real-time Diagnosis. When normal, go to (6). When abnormal, go to the relevant items for (3), (4), (5).</p> <p>Check EyeSight steering switch  Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>CHECK EyeSight STEERING SWITCH.</p> <p>CHECK STOP LIGHT SWITCH AND BRAKE SWITCH  Ref. to BRAKE>Brake Pedal.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>12.</p> <p>CHECK NEUTRAL POSITION SWITCH.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>14.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>62.</p> <p>Check the vehicle speed sensor.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>22.</p>
3	SET indicator does not illuminate.	Check the SET indicator.	CHECK SET INDICATOR.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>CHECK ADAPTIVE CRUISE CONTROL INDICATOR LIGHT/CONSTANT SPEED CRUISE CONTROL INDICATOR LIGHT AND CRUISE SET INDICATOR LIGHT.	
4	Vehicle speed is not held within set speed ± 3 km/h (± 2 MPH) on a level road.	Check the vehicle speed sensor.	Inspection of vehicle speed sensor  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>22.	
5	Vehicle speed does not increase or does not return to set speed after RES/+ switch has been pressed.	(1) Perform the real-time diagnosis. Check the input signal of cruise control system.	Real-time Diagnosis  Ref. to EyeSight (DIAGNOSTICS)>Real-time Diagnosis. When abnormal, go to (2).	
		(2) Check the RES/+ switch.	Inspection of RES/+ switch  Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>CHECK EyeSight STEERING SWITCH.	
6	Vehicle speed does not	(1) Perform the real-	Real-time Diagnosis  Ref. to EyeSight	






	decrease after SET/– switch has been pressed.	time diagnosis. Check the input signal of cruise control system.	(DIAGNOSTICS)>Real-time Diagnosis. When abnormal, go to (2).
		(2) Check the SET/– switch.	CHECK SET/– SWITCH.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>CHECK EyeSight STEERING SWITCH.
7	Cruise control is not released after CRUISE switch has been pressed.	(1) Perform the real-time diagnosis. Check the input signal of cruise control system.	Real-time Diagnosis  Ref. to EyeSight (DIAGNOSTICS)>Real-time Diagnosis. When abnormal, go to (2).
		(2) Check the CRUISE switch.	Check CRUISE switch  Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>CHECK EyeSight STEERING SWITCH.
8	Following distance does not change, even after the following distance switch is pressed.	(1) Perform the real-time diagnosis. Check the input signal of cruise control system.	Real-time Diagnosis  Ref. to EyeSight (DIAGNOSTICS)>Real-time Diagnosis. When abnormal, go to (2).
		(2) Check the following distance switch.	Inspection of following distance switch  Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>CHECK EyeSight STEERING SWITCH.
9	Cruise control is not released after brake pedal has been depressed.	(1) Perform the real-time diagnosis. Check the input signal of cruise control system.	Real-time Diagnosis  Ref. to EyeSight (DIAGNOSTICS)>Real-time Diagnosis. When abnormal, go to (2).
		(2) Check stop light switch and brake switch.	CHECK STOP LIGHT SWITCH AND BRAKE SWITCH  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>12.  Ref. to BRAKE>Stop Light Switch>INSTALLATION.
10	Cruise control is not released after shifting to the neutral position.	(1) Perform the real-time diagnosis. Check the input signal of cruise control system.	Real-time Diagnosis  Ref. to EyeSight (DIAGNOSTICS)>Real-time Diagnosis. When abnormal, go to (2).
		(2) Check the neutral position switch.	CHECK NEUTRAL POSITION SWITCH.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>14.


11	<p>Acceleration or deceleration does not occur according to the preceding vehicle. The preceding vehicle is difficult to be detected. Braking force is weaker than usual. Alarm for requiring more brake pedal force does not sound.</p>	<p>(1) Using CHECK LIST (ADAPTIVE CRUISE CONTROL), check the condition and respond to it.</p> <p>1) Is this applied to the condition that the use of adaptive cruise control is not desired?</p> <p>2) Is this applied to the object or condition that is hard to be recognized by the stereo camera?</p> <p>3) Is this applied to the driving condition that the preceding vehicle cannot be recognized or the vehicle on the next lane or the object on the roadside may be recognized by mistake?</p> <p>4) Is this applied to the condition that brake force may become poor?</p> <p>5) Is this applied to the condition that the alarm for requiring more brake pedal force does not sound even in a short vehicle distance?</p>	<p>Check list (adaptive cruise control)  Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON > CHECK LIST (ADAPTIVE CRUISE CONTROL).</p> <p>When there is a relevant item in the check list, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved. If not solved, go to (2).</p>
		<p>(2) Check the windshield glass and dashboard.</p>	<p>Inspection of windshield glass and dashboard  Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION > WINDSHIELD GLASS AND DASHBOARD.</p> <p>When normal, go to (3).</p>
		<p>(3) Check the front wiper.</p>	<p>Inspection of front wiper  Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION > FRONT WIPER.</p> <p>When normal, go to (4).</p>
		<p>(4) Check the stereo camera.</p>	<p>CHECK STEREO CAMERA.  Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION > STEREO CAMERA.</p>

		When normal, go to (5).
	(5) Bleed air from brake system.	Air bleeding from brake system  Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE. Go to (6).
	(6) Check the optical axis of the stereo camera.	Adjust the optical axis of the stereo camera.  Ref. to EyeSight>Camera Adjustment, Inspection.


3. PRE-COLLISION BRAKE, AT RAPID START PREVENTION CONTROL





	Phenomenon	Check Item	Note
1	Pre-collision brake does not operate. Or the pre-collision brake operates, but the vehicle cannot stop safely before collision. Or the pre-collision brake is released automatically. Or the pre-collision brake assist does not operate.	(1) Check that the pre-collision brake OFF indicator light goes off. (2) Using CHECK LIST (PRE-COLLISION BRAKE), check the following and respond to it. 1) Is this applied to the condition that the pre-collision brake does not operate, or there is a high possibility that the vehicle cannot stop safely before collision with the pre-collision brake? 2) Is this applied to the condition that there is a high possibility that the pre-collision brake does not operate due to the recognition status of the stereo camera? 3) Is this applied to the condition that the system does not operate correctly and the turning OFF of the pre-collision brake is desired? 4) Is this applied to the condition that the pre-collision brake OFF	If this indicator light illuminates, the operation is not performed. Check list (pre-collision brake)  Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON > CHECK LIST (PRE-COLLISION BRAKE). When there is a relevant item in the check list, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved. If not solved, the stereo camera may be malfunctioning.




		indicator light illuminates?	
2	Pre-collision brake operates improperly. Or the pre-collision brake is not released. Or the pre-collision brake assist operates improperly.	(1) Using CHECK LIST (PRE-COLLISION BRAKE), check the following and respond to it. 1) Is this applied to the condition that the turning OFF of the pre-collision brake is desired? 2) Is this applied to the condition that the pre-collision brake may operate?	Check list (pre-collision brake)  Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON > CHECK LIST (PRE-COLLISION BRAKE). When there is a relevant item in the check list, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved. If not solved, the stereo camera may be malfunctioning.
3	Pre-collision brake OFF indicator light does not go off. Or the pre-collision brake OFF indicator light illuminates automatically.	(1) Check that this failure occurs during engine start.	Light illumination for a while after the engine start is a normal.
		(2) Check EyeSight temporary stop code to see if temporary stop has occurred.	If the EyeSight temporary stop code is displayed, check the diagnosis from the List of EyeSight temporary stop code, and perform the corresponding operations.  Ref. to EyeSight (DIAGNOSTICS)>EyeSight Temporary Code(s) Display. If the cancel code is not displayed, go to (3).
		(3) Check the pre-collision brake OFF switch.	Inspection of pre-collision brake OFF switch  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B6 PRE-COLLISION OFF SWITCH.
4	Pre-collision brake OFF indicator light does not illuminate. Or the pre-collision brake OFF indicator light goes off automatically.	(1) Check that this failure occurs during engine start.	Even if the pre-collision brake is turned off, it is turned on again when the engine switch is turned off and the engine has restarted.
		(2) Check the pre-collision brake OFF switch.	Inspection of pre-collision brake OFF switch  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B6 PRE-COLLISION OFF SWITCH.
5	AT rapid start prevention control does not operate. Or the AT rapid start prevention control is released automatically.	(1) Check that the pre-collision brake OFF indicator light goes off.	If this indicator light illuminates, the operation is not performed.
		(2) Using CHECK LIST (AT RAPID START PREVENTION CONTROL), check the	Check list (AT rapid start prevention control)  Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE


		<p>following and respond to it.</p> <p>1) Is this applied to the condition that the AT rapid start prevention control may not operate?</p> <p>2) Is this applied to the condition that the pre-collision brake OFF indicator light illuminates?</p>	<p>WITH PHENOMENON > CHECK LIST (AT RAPID START PREVENTION CONTROL).</p> <p>When there is a relevant item in the check list, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved. If not solved, the stereo camera may be malfunctioning.</p>
6	<p>AT rapid start prevention control operates improperly. Or the AT rapid start prevention control is not released.</p>	<p>(1) Using CHECK LIST (AT RAPID START PREVENTION CONTROL), check the following and respond to it.</p> <p>1) Is this applied to the condition that the turning OFF of the AT rapid start prevention control is desired?</p> <p>2) Is this applied to the condition that the AT rapid start prevention control may operate?</p>	<p>Check list (AT rapid start prevention control)</p> <p> Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON > CHECK LIST (AT RAPID START PREVENTION CONTROL).</p> <p>When there is a relevant item in the check list, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved. If not solved, the stereo camera may be malfunctioning.</p>

4. LANE DEPARTURE WARNING, SWAY WARNING, FORWARD VEHICLE'S START MONITORING FUNCTION

	Phenomenon	Check Item	Note
1	<p>Lane departure warning does not operate.</p> <p>Or the lane departure warning is released automatically.</p>	<p>(1) Check that the lane departure warning OFF indicator light goes off.</p> <p>(2) Using CHECK LIST (LANE DEPARTURE WARNING, SWAY WARNING, FORWARD VEHICLE'S START MONITORING FUNCTION), check the following and respond to it.</p> <p>1) Is this applied to the condition that the lane departure warning</p>	<p>If this indicator light illuminates, the operation is not performed.</p> <p>Check list (lane departure warning, sway warning, forward vehicle's start monitoring function)  Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON > CHECK LIST (LANE DEPARTURE WARNING, SWAY WARNING, FORWARD VEHICLE'S START MONITORING FUNCTION).</p> <p>When there is a relevant item in the check list, it can be the cause of malfunction. Eliminate the cause, and check that the</p>

		<p>does not operate or is difficult to operate?</p> <p>2) Is this applied to the condition that the lane departure warning OFF indicator light illuminates?</p>	<p>malfunction has been improved. If not solved, the stereo camera may be malfunctioning.</p>
2	<p>Lane departure warning operates improperly.</p> <p>Or the lane departure warning is not released.</p>	<p>(1) Using CHECK LIST (LANE DEPARTURE WARNING, SWAY WARNING, FORWARD VEHICLE'S START MONITORING FUNCTION), check the following and respond to it.</p> <p>1) Is this applied to the condition that the vehicle lane is recognized erroneously and the lane departure warning may operate?</p>	<p>Check list (lane departure warning, sway warning, forward vehicle's start monitoring function)  Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON > CHECK LIST (LANE DEPARTURE WARNING, SWAY WARNING, FORWARD VEHICLE'S START MONITORING FUNCTION).</p> <p>When there is a relevant item in the check list, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved. If not solved, the stereo camera may be malfunctioning.</p>
3	<p>Lane departure warning OFF indicator light does not go off.</p> <p>Or the lane departure warning OFF indicator light illuminates automatically.</p>	<p>(1) Check that this failure occurs during engine start.</p>	<p>Light illumination for a while after the engine start is a normal. Even if the engine switch is turned off and the engine is restarted, the status before the engine switch off is maintained.</p>
		<p>(2) Check EyeSight temporary stop code to see if temporary stop has occurred.</p>	<p>If the EyeSight temporary stop code is displayed, check the diagnosis from the List of EyeSight temporary stop code, and perform the corresponding operations.  Ref. to EyeSight (DIAGNOSTICS)>EyeSight Temporary Code(s) Display.</p> <p>If the cancel code is not displayed, go to (3).</p>
		<p>(3) Check the lane departure warning OFF indicator light.</p>	<p>Inspection of lane departure warning OFF indicator light  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B7 LDP OFF SWITCH.</p>
4	<p>Lane departure warning OFF indicator light does not illuminate.</p> <p>Or the lane departure warning OFF indicator</p>	<p>(1) Check the lane departure warning OFF indicator light.</p>	<p>Inspection of lane departure warning OFF indicator light  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B7 LDP OFF SWITCH.</p>





	light goes off automatically.		
5	Sway warning does not operate. Or the sway warning is released automatically.	(1) Check that the lane departure warning OFF indicator light goes off. (2) Using CHECK LIST (LANE DEPARTURE WARNING, SWAY WARNING, FORWARD VEHICLE'S START MONITORING FUNCTION), check the following and respond to it. 1) Is this applied to the condition that the sway warning may not operate? 2) Is this applied to the condition that the lane departure warning OFF indicator light illuminates?	If this indicator light illuminates, the operation is not performed. Check list (lane departure warning, sway warning, forward vehicle's start monitoring function)  Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON > CHECK LIST (LANE DEPARTURE WARNING, SWAY WARNING, FORWARD VEHICLE'S START MONITORING FUNCTION). When there is a relevant item in the check list, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved. If not solved, the stereo camera may be malfunctioning.
6	Sway warning operates improperly. Or the sway warning is not released.	(1) Using CHECK LIST (LANE DEPARTURE WARNING, SWAY WARNING, FORWARD VEHICLE'S START MONITORING FUNCTION), check the following and respond to it. 1) Is this applied to the condition that the sway warning may operate improperly?	Check list (lane departure warning, sway warning, forward vehicle's start monitoring function)  Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON > CHECK LIST (LANE DEPARTURE WARNING, SWAY WARNING, FORWARD VEHICLE'S START MONITORING FUNCTION). When there is a relevant item in the check list, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved. If not solved, the stereo camera may be malfunctioning.
7	Forward vehicle's start monitoring function does not operate. Or the forward vehicle's start monitoring function is released automatically.	(1) Using CHECK LIST (LANE DEPARTURE WARNING, SWAY WARNING, FORWARD VEHICLE'S START MONITORING FUNCTION), check the following and respond to it.	Check list (lane departure warning, sway warning, forward vehicle's start monitoring function)  Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON > CHECK LIST (LANE DEPARTURE WARNING, SWAY WARNING, FORWARD VEHICLE'S START MONITORING FUNCTION).







		1) Is this applied to the condition that the forward vehicle's start monitoring function does not operate even when the preceding vehicle has already started?	When there is a relevant item in the check list, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved. If not solved, the stereo camera may be malfunctioning.
8	Forward vehicle's start monitoring function operates improperly. Or the forward vehicle's start monitoring function is not released.	(1) Using CHECK LIST (LANE DEPARTURE WARNING, SWAY WARNING, FORWARD VEHICLE'S START MONITORING FUNCTION), check the following and respond to it. 1) Is this applied to the condition that the forward vehicle's start monitoring function operates even when the preceding vehicle has not yet started?	Check list (lane departure warning, sway warning, forward vehicle's start monitoring function)  Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON > CHECK LIST (LANE DEPARTURE WARNING, SWAY WARNING, FORWARD VEHICLE'S START MONITORING FUNCTION). When there is a relevant item in the check list, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved. If not solved, the stereo camera may be malfunctioning.





5. ACTIVE LANE KEEP (LANE DEPARTURE PREVENTION)

Note:

Make sure in advance that adaptive cruise control is not set.

	Phenomenon	Check Item	Note
1	Lane keep switch is not turned to ON. (Lane keep indicator light does not illuminate in white.)	(1) Perform the real-time diagnosis. Check the input signal of EyeSight system. (2) Check the lane keep switch. (3) Check the combination meter.	Real-time Diagnosis  Ref. to EyeSight (DIAGNOSTICS)>Real-time Diagnosis. When normal, go to (3). When abnormal, go to (2). Check EyeSight steering switch  Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>CHECK EyeSight STEERING SWITCH. Combination meter (diagnostics)  Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.
2	Lane keep (lane departure prevention) does not turn to standby mode. (Lane	(1) Read the lane departure prevention deactivate code.  Ref. to EyeSight (DIAGNOSTICS)>Activ	When there is a relevant item in the lane departure prevention deactivate code, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved.

<p>indicator light does not illuminate.)</p>	<p>e Lane Keep System Code(s) Display.</p>	<p>If not solved, go to (2).</p>
<p>Lane keep (lane departure prevention) does not operate. (Lane keep indicator light does not illuminate in green.) Though lane keep (lane departure prevention) is operating, the vehicle departs out of the lane due to poor assistance.</p>	<p>(2) Using CHECK LIST (LANE KEEP), check the current conditions and respond to it.</p> <p>1) Does it apply to the condition that use of lane keeping is not desired?</p> <p>2) Is this applied to the object or condition that is hard to be recognized by the stereo camera?</p> <p>3) Does it apply to the road condition that the white line is difficult to be recognized?</p>	<p>Check list (lane keep)  Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON > CHECK LIST (ACTIVE LANE KEEP).</p> <p>When there is a relevant item in the check list, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved.</p> <p>If not solved, go to (3).</p>
	<p>(3) Check the windshield glass and dashboard.</p>	<p>Inspection of windshield glass and dashboard  Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION > WINDSHIELD GLASS AND DASHBOARD.</p> <p>When normal, go to (4).</p>
	<p>(4) Check the front wiper.</p>	<p>Inspection of front wiper  Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION > FRONT WIPER.</p> <p>When normal, go to (5).</p>
	<p>(5) Check the optical axis of the headlights.</p>	<p>Headlight optical axis adjustment  Ref. to LIGHTING SYSTEM>Headlight Assembly>ADJUSTMENT.</p> <p>When normal, go to (6).</p>
	<p>(6) Check the stereo camera.</p>	<p>CHECK STEREO CAMERA.  Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION > STEREO CAMERA.</p> <p>When normal, go to (7).</p>
	<p>(7) Check the tires and wheel alignment.</p>	<p>When normal, go to (8).</p>
	<p>(8) Check the midpoint of the steering angle sensor.</p>	<p>Perform «VSC(VDC) Centering Mode» for VDC.  Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.</p>

			After the adjustment, check the following value when the vehicle is in the straight ahead position. Using Subaru Select Monitor, check that the value of «Steering Angle Sensor Value (Right +) (Left -)» is within “-2 — +2 deg” for the current data of the stereo camera.  Ref. to EyeSight (DIAGNOSTICS)>Data Monitor. When normal, go to (9).
		(9) Perform the automatic adjustment by driving.	Perform the automatic adjustment by driving. (Refer to “Automatic adjustment by driving” in margin*) Using the Subaru Select Monitor, check that the value of current data «Active Lane Keep System Control Learning Value 3 (Steering Wheel Angles Offset)» of stereo camera is within “-4.8 — 4.8”.  Ref. to EyeSight (DIAGNOSTICS)>Data Monitor. When normal, go to (10).
		(10) Check the optical axis of the stereo camera.	Adjust the optical axis of the stereo camera.  Ref. to EyeSight>Camera Adjustment, Inspection.
3	Lane keep (lane departure prevention) is cancelled without releasing operation.	Read the lane departure prevention deactivate code.  Ref. to EyeSight (DIAGNOSTICS)>Active Lane Keep System Code(s) Display.	When there is a relevant item in the lane departure prevention deactivate code, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved.

6. CHECK LIST (ADAPTIVE CRUISE CONTROL)



Item Name		Yes/No	
[1]: When the vehicle does not accelerate or decelerate according to the preceding vehicle, or when the preceding vehicle is difficult to be detected.			
1	Check that the following are applied to the condition that the use of adaptive cruise control is not desired.		
1	Tire pressure is not correct.	Y e s	N o
2	The vehicle is equipped with the temporary spare tire.	Y e s	N o

3	The vehicle is equipped with worn tire or tires with excessive wear difference.	Y e s	N o
4	The vehicle is equipped with the tires out of specification.	Y e s	N o
5	The suspension has been modified.	Y e s	N o
6	The vehicle is equipped with the tire chain.	Y e s	N o
7	Headlight is dirty or the optical axis is deviated. (The vehicle cannot correctly emit the headlight beam against the object and recognize it.)	Y e s	N o
8	The driving of own vehicle is unstable due to an accident or failure.	Y e s	N o
9	The brake warning light illuminates.	Y e s	N o
1 0	Vehicle is tilted by the heavy load.	Y e s	N o
1 1	Passenger capacity is exceeded.	Y e s	N o
1 2	The vehicle is towing the trailer or other vehicle.	Y e s	N o
1 3	The vehicle drives on the general road (other than limited highway). (Depending on the road environment (complicated roads etc.), the vehicle may not be able to drive according to the traffic condition, which may lead to the traffic accident.)	Y e s	N o
1 4	The vehicle drives on the sharp bend.	Y e s	N o
1 5	The vehicle drives on the slippery roads such as icy road or snow-covered road. (Tires can spin, losing the vehicle control.)	Y e s	N o
1 6	The vehicle drives under the traffic condition that the certain vehicle distance is difficult to be maintained due to frequent acceleration and deceleration. (The vehicle may not be able to drive according to the traffic condition.)	Y e s	N o
1 7	There is a steep downhill. (The vehicle may drive at higher speed than set vehicle speed.)	Y e s	N o

1 8	The vehicle performs adaptive driving while recognizing the preceding vehicle on the steep downhills. (Brake can be overheated.)	Y e s	N o s
1 9	The vehicle drives on the road with repeated steep uphill and downhill or crossover. (The vehicle may not be able to recognize the preceding vehicle or may recognize the road surface, and appropriate control may not be performed.)	Y e s	N o s
2 0	The vehicle is entering the interchange, service area, parking area, junction or tollgate. (The vehicle may not be able to recognize the preceding vehicle.)	Y e s	N o s
2 1	When the surrounding brightness (such as inlet and outlet of a tunnel) suddenly changes.	Y e s	N o s
2 2	There are water, snow or sandy dust raised by the preceding vehicle or oncoming vehicle, or sand or smoke blown in the wind, or moisture in front of own vehicle. (The vehicle may not be able to recognize the preceding vehicle or may recognize the water, and appropriate control may not be performed.)	Y e s	N o s
2 3	The windshield glass is covered with fog, snow, dirt, frost or sandy dust.	Y e s	N o s
2 4	The raindrops, water drops or dirt on the windshield glass are not wiped off sufficiently. (The vehicle may not be able to recognize the preceding vehicle, and appropriate control may not be performed.)	Y e s	N o s
2 5	Canoes etc. loaded on the roof block the visibility of the stereo camera.	Y e s	N o s
2	Check that the following are applied to the object or condition that is hard to be recognized by the stereo camera.		
1	That was a vehicle with large speed difference (low-speed driving vehicle, stopping vehicle, oncoming vehicle).	Y e s	N o s
2	That was a cutting-in vehicle.	Y e s	N o s
3	That was a motorcycle, bicycle, pedestrian or animal, etc.	Y e s	N o s
4	It was dim in the evening or in the morning.	Y e s	N o s
5	The headlight did not illuminate during nighttime hours or inside the tunnel.	Y e s	N o s
6	The tail light of the preceding vehicle did not illuminate during nighttime hours or inside the tunnel.	Y e s	N o s

7	The vehicle was exposed to the intense light (backlight such as sunlight or headlight high-beam light) from the front of the vehicle.	Y e s	N o
8	The rearmost surface of the preceding vehicle was small, low or uneven. That was a truck equipped with an unloaded platform without gate, a vehicle that the luggage was protruding from the rear end of the vehicle, a vehicle of special shape (carrier car, side car, etc.) or a vehicle with low vehicle height.	Y e s	N o
9	There was an object extremely close to the bumper of the own vehicle.	Y e s	N o
3	Check that the following are applied to the driving condition that the preceding vehicle cannot be recognized or the vehicle on the next lane or the object on the roadside may be recognized by mistake.		
1	The vehicle began adaptive cruise control from the condition that the vehicle distance was short immediately after the preceding vehicle was cut in.	Y e s	N o
2	The vehicle drives on the curve, outlet and inlet of the curve, or the road with many curves in succession. (Recognition may not be performed properly, because the preceding vehicle is out of recognition area.)	Y e s	N o
3	The position against the preceding vehicle deviated laterally.	Y e s	N o
4	There were some objects just near the road side.	Y e s	N o
5	The speed difference against the preceding vehicle was large.	Y e s	N o
6	Other vehicle cut ahead of the own vehicle.	Y e s	N o
7	The vehicle distance was extremely short.	Y e s	N o
8	The own vehicle swayed in the vehicle lane.	Y e s	N o
9	The road surface was uneven due to roll or unpaved track.	Y e s	N o
10	The vehicle drove on the narrow lane because of the lane closure or construction work.	Y e s	N o
1	The driving of own vehicle was unstable due to an accident or failure.	Y	N

1		e	o
1	The own vehicle was loaded with the extremely heavy load in the luggage compartment	Y	N
2	or on the rear seat.	e	o
		s	s

[2]: When braking force is weaker than usual.

1	Check that the current status applies to the condition that brake force may become poor.		
1	The vehicle status (loading amount, passenger, etc.) was inappropriate.	Y	N
		e	o
		s	s
2	The road surface was very steep, slippery, sharp turn, or uneven.	Y	N
		e	o
		s	s
3	The service maintenance condition of the vehicle (brake system, tire wear, tire pressure, spare tire, etc.) was inappropriate.	Y	N
		e	o
		s	s
4	The brake was cold at low ambient temperature or immediately after the driving had started.	Y	N
		e	o
		s	s
5	The symptom occurred between immediately after engine started and after a while the vehicle started driving. (Completion of warming up operation can be used as an indication.)	Y	N
		e	o
		s	s
6	The brake force becomes poor due to the overheating of the brake on the downhills.	Y	N
		e	o
		s	s
7	The brake force becomes poor because of the wet brake after driving onto the puddle or washing the vehicle.	Y	N
		e	o
		s	s

[3]: When the alarm for requiring more brake pedal force does not sound.

1	Check that the current status applies to the condition that the alarm for requiring more brake pedal force does not sound even in a short vehicle distance.		
1	The speed difference between own vehicle and preceding vehicle (when the vehicle speed of the own vehicle was approximately the same as that of the preceding vehicle) was small.	Y	N
		e	o
		s	s
2	The vehicle speed of the preceding vehicle was faster than that of the own vehicle (when the vehicle distance was getting longer).	Y	N
		e	o
		s	s
3	Other vehicle cut in extremely close to the own vehicle.	Y	N
		e	o
		s	s
4	The preceding vehicle decelerated abruptly.	Y	N
		e	o
		s	s
	There are many continuous uphills and downhills.	Y	N
		e	o

7. CHECK LIST (PRE-COLLISION BRAKE)



Item Name		Yes/ No	
[1]: When pre-collision brake did not operate, or when vehicle could not stop safely before collision in spite of pre-collision brake operation.			
1	Check that the following are applied to the condition that the pre-collision brake does not operate, or there is a high possibility that the vehicle cannot stop safely before collision in spite of pre-collision brake operation.		
1	The following conditions occurred. Vehicle speed difference in the preceding was small. Vehicle distance was long. Lateral deviation was large (offset amount).	Y e s	N o
2	The vehicle status (loading amount, number of passenger, etc.) was inappropriate.	Y e s	N o
3	The road surface was very steep, slippery, sharp turn, or uneven.	Y e s	N o
4	There was problem for the frontal visibility. (Rain, snow, fog, smoke, etc.)	Y e s	N o
5	The objects were livestock, animals, guardrail, telephone pole, tree, fence, wall, etc.	Y e s	N o
6	The object was motorcycle, bicycle, or pedestrian. However, the system could not recognize the object due to surrounding brightness, motion, posture, and/or angle.	Y e s	N o
7	Crash avoidance operation (accelerator pedal, brake pedal, steering wheel, etc.) was performed.	Y e s	N o
8	The service maintenance condition of the vehicle (brake system, tire wear, tire pressure, spare tire, etc.) was inappropriate.	Y e s	N o
9	The vehicle is towing the trailer or other vehicle.	Y e s	N o
10	The brake was cold at low ambient temperature or immediately after the driving had started.	Y e s	N o
11	The brake force becomes poor due to the overheating of the brake on the downhills.	Y e s	N o

1	The brake force becomes poor because of the wet brake after driving onto the puddle or washing the vehicle.	Y	N
2		e	o
		s	
2	Check that the following are applied to the condition that there is a high possibility that the pre-collision brake does not operate depending on the recognition status of the stereo camera.		
1	It was bad weather (heavy rain, snowstorm, dense fog).	Y	N
		e	o
		s	
2	The field of view was insufficient due to water, snow or sandy dust raised by the preceding vehicle or oncoming vehicle, or the moisture, sand or smoke blown in the wind.	Y	N
		e	o
		s	
3	The headlight did not illuminate during nighttime hours or inside the tunnel.	Y	N
		e	o
		s	
4	The tail light of the preceding vehicle did not illuminate during nighttime hours or inside the tunnel.	Y	N
		e	o
		s	
5	The vehicle approached the motorcycle, bicycle or pedestrian in the night.	Y	N
		e	o
		s	
6	It was dark in the evening or in the morning.	Y	N
		e	o
		s	
7	The rearmost surface of the preceding vehicle was small, low or uneven. That was a truck equipped with an unloaded platform without gate, a vehicle that the luggage was protruding from the rear end of the vehicle, a vehicle of special shape (carrier car, side car, etc.) or a vehicle with low vehicle height.	Y	N
		e	o
		s	
8	There was a wall in front of the stopping vehicle.	Y	N
		e	o
		s	
9	There was an object close to the vehicle.	Y	N
		e	o
		s	
10	That was a vehicle stopped sideways.	Y	N
		e	o
		s	
11	That was a vehicle which was oncoming or driving in reverse.	Y	N
		e	o
		s	
12	The object was small seen from the stereo camera. (small animals, infants, person squatting down or lying down)	Y	N
		e	o
		s	
13	The preceding vehicle made a sharp turn, or performed abrupt acceleration or deceleration.	Y	N
		e	o
		s	

1 4	Other vehicle, motorcycle, bicycle or pedestrian existed extremely close to the bumper of the own vehicle.	Y e s	N o
1 5	The speed difference was 5 km/h (3.1 MPH) or less. (The control is performed in close distance. Depending on the objects shape and size, the rear end surface may be outside the camera visibility area.)	Y e s	N o
1 6	Other vehicle, motorcycle, bicycle or pedestrian cut in from the side or jumped in front of the own vehicle.	Y e s	N o
1 7	The own vehicle changed the vehicle lane, and followed the preceding vehicle right behind.	Y e s	N o
1 8	The vehicle was exposed to the intense light (backlight such as sunlight or headlight high-beam light) from the front of the vehicle.	Y e s	N o
1 9	The windshield glass was covered with fog, snow, dirt, frost or sandy dust.	Y e s	N o
2 0	The windshield glass has not yet been wiped off sufficiently during or after the use of the window washer.	Y e s	N o
2 1	The recognition of the object was imperfect due to the raindrop or droplet of the window washer or the wiper blade blocking the visibility of the stereo camera.	Y e s	
2 2	Canoes etc. loaded on the roof blocked the visibility of the stereo camera.	Y e s	N o
2 3	Other vehicle, motorcycle, bicycle or pedestrian existed out of the illuminating area of the headlight.	Y e s	N o
2 4	The vehicle drove on the sharp turn, steep uphill or steep downhill.	Y e s	N o
2 5	The road surface was uneven due to roll or unpaved track.	Y e s	N o
2 6	The vehicle passed through the outlet or inlet of a tunnel.	Y e s	N o
2 7	The object was fence or wall.	Y e s	N o
2 8	The object was a plate of glass, mirror wall or door.	Y e s	N o

3	Check that the following are applied to the condition that the system does not operate correctly and the turning OFF of the pre-collision brake is desired.		
1	Tire pressure is not correct.	Y e s	N o
2	The vehicle is equipped with the temporary spare tire.	Y e s	N o
3	The vehicle is equipped with worn tire or tires with excessive wear difference.	Y e s	N o
4	The vehicle is equipped with the tires out of specification.	Y e s	N o
5	The suspension has been modified.	Y e s	N o
6	The vehicle is equipped with the tire chain.	Y e s	N o
7	Headlight is dirty or the optical axis is deviated. (The vehicle cannot correctly emit the headlight beam against the object and recognize it.)	Y e s	N o
8	The driving status of own vehicle is unstable due to an accident or failure.	Y e s	N o
9	The brake warning light illuminates.	Y e s	N o
10	Vehicle is tilted by the heavy load. Or, passenger capacity is exceeded.	Y e s	N o
4	Check that the current status applies to the condition that the pre-collision brake OFF indicator light illuminates. (When the pre-collision brake OFF indicator light illuminates, the pre-collision brake does not operate.)		
1	The pre-collision brake is turned off, using the pre-collision brake OFF switch.	Y e s	N o
2	Approximately for 7 seconds after the engine has started.	Y e s	N o
3	EyeSight is malfunctioning.	Y e s	N o
4	EyeSight is stopped temporarily.	Y	N

			e	o	
			s		
[2]: When pre-collision brake operated improperly.					
1	Check that the following are applied to the condition that the turning OFF of the pre-collision brake is desired.				
1	The vehicle is towed.		Y e s	N o	
2	The vehicle is loaded on the carrier car.		Y e s	N o	
3	The chassis dynamometer or free roller is used.		Y e s	N o	
4	The vehicle is lifted up, engine is started and the tire is spun.		Y e s	N o	
5	The vehicle passes through the banners, flags, drooping branches or grass while making contact with them.		Y e s	N o	
6	The vehicle performs sporty driving on the circuit.		Y e s	N o	
7	When the vehicle uses the movable type car wash machine.		Y e s	N o	
2	Check that the following are applied to the condition that the pre-collision brake may operate.				
1	The vehicle passes through the ETC gate at a speed exceeding the specification.		Y e s	N o	
2	The vehicle drives close to the preceding vehicle.		Y e s	N o	
3	The vehicle drives on the place where the road surface gradient changed suddenly.		Y e s	N o	
4	The vehicle passes through the moisture or mass of smoke.		Y e s	N o	
5	When the exhaust gas emitted from the preceding vehicle is visible clearly at cold weather.		Y e s	N o	
6	There is an obstacle on the curve or crossing.		Y e s	N o	

7	The vehicle passes through close to other vehicle or obstacle.	Y e s	N o
8	The vehicle parks close to the wall in front or to other vehicle.	Y e s	N o

8. CHECK LIST (AT RAPID START PREVENTION CONTROL)



Item Name		Yes/ No	
[1]: When AT rapid start prevention control did not operate.			
1	Check that the following are applied to the condition that the AT rapid start prevention control may not operate.		
1	Conditions such as the followings occurred: 1) Distance from the front object is long. 2) Vehicle speed difference is small. 3) Lateral deviation (offset amount) is large.	Y e s	N o
2	It was bad weather (heavy rain, snowstorm, dense fog).	Y e s	N o
3	The visibility was insufficient due to sand or smoke blown in the air.	Y e s	N o
4	The vehicle approached the object in the evening, in the morning or in the night.	Y e s	N o
5	The vehicle approached the object in the dark place (e.g. closed-in parking lot).	Y e s	N o
6	The height of the object was low. (low wall, low guardrail, vehicle with low height etc.)	Y e s	N o
7	The object was small seen from the stereo camera. (small animals, infants, person squatting down or lying down)	Y e s	N o
8	The object or rearmost area of the preceding vehicle (trailer, etc.) was small. Or the vehicle approached them too close. (The system triggers the operation by recognizing the area other than the rearmost section, resulting in insufficient control.)	Y e s	N o
9	The object such as other vehicle, motorcycle, bicycle or pedestrian cut in from the side or jumped in front of the own vehicle.	Y e s	N o
10	The own vehicle changed the vehicle lane when it started, and approached right behind the object.	Y e s	N o

			s	
1	The vehicle was exposed to the intense light (backlight such as sunlight or headlight high-beam light) from the front of the vehicle.	Y	e	s
1	The windshield glass was covered with fog, snow, dirt, frost or sandy dust.	Y	N	e
2		s	o	s
1	The windshield glass has not yet been wiped off sufficiently during or after the use of the window washer.	Y	N	e
3		s	o	s
1	The recognition of the object was imperfect due to the raindrop or droplet of the window washer or the wiper blade blocking the visibility of the stereo camera.	Y	N	e
4		s	o	s
1	Canoes etc. loaded on the roof blocked the visibility of the stereo camera.	Y	N	e
5		s	o	s
1	The object existed out of the illuminating area of the headlight.	Y	N	e
6		s	o	s
1	The vehicle drove on the sharp turn, steep uphill or steep downhill.	Y	N	e
7		s	o	s
1	The object was a fence or wall with even pattern (striped pattern or bricks) or unpatterned surface.	Y	N	e
8		s	o	s
1	The object was a plate of glass, mirror wall or door.	Y	N	e
9		s	o	s
2	Crash avoidance operation (accelerator pedal, brake pedal, steering wheel, etc.) was performed.	Y	N	e
0		s	o	s
2	Check that the current status applies to the condition that the pre-collision brake OFF indicator light illuminates. (When the pre-collision brake OFF indicator light illuminates, the AT rapid start prevention control does not operate.)			
1	The pre-collision brake was turned off, using the pre-collision brake OFF switch.	Y	N	e
		s	o	s
2	Approximately for 7 seconds after the engine has started.	Y	N	e
		s	o	s
3	EyeSight is malfunctioning.	Y	N	e
		s	o	s
4	EyeSight is stopped temporarily.	Y	N	e
		s	o	s

				s
[2]: When AT rapid start prevention control operated improperly.				
1	Check that the following are applied to the condition that the turning OFF of the AT rapid start prevention control is desired.			
1	The vehicle is towed.		Y e s	N o
2	The vehicle is loaded on the carrier car.		Y e s	N o
3	The chassis dynamometer or free roller is used.		Y e s	N o
4	The vehicle is lifted up, engine is started and the tire is spun.		Y e s	N o
5	The vehicle passes through the banners, flags, drooping branches or grass while making contact with them.		Y e s	N o
6	The vehicle performs sporty driving on the circuit.		Y e s	N o
2	Check that the following are applied to the condition that the AT rapid start prevention control may operate.			
1	The vehicle passes through the ETC gate at a speed exceeding the specification.		Y e s	N o
2	The vehicle drives close to the preceding vehicle.		Y e s	N o
3	The vehicle drives on the place where the road surface gradient changed suddenly.		Y e s	N o
4	The vehicle passes through the moisture or mass of smoke.		Y e s	N o
5	There is an obstacle on the curve or crossing.		Y e s	N o
6	The vehicle passes through close to other vehicle or obstacle.		Y e s	N o
7	The vehicle parks close to the wall in front or to other vehicle.		Y e s	N o

9. CHECK LIST (LANE DEPARTURE WARNING, SWAY WARNING, FORWARD VEHICLE'S START MONITORING FUNCTION)



Item Name		Yes/ No	
[1]: When lane departure warning did not operate.			
1	Check that the following are applied to the condition that the lane departure warning does not operate or is difficult to operate.		
1	The lane departure warning is turned off.	Y e s	N o
2	The vehicle speed of the own vehicle is approximately less than 50 km/h (31 MPH).	Y e s	N o
3	That was approximately 7 seconds period after the lane departure warning had occurred once.	Y e s	N o
4	The steering wheel was turned fully or rapidly.	Y e s	N o
5	The brake pedal is depressed.	Y e s	N o
6	The vehicle is accelerated by depressing the accelerator pedal.	Y e s	N o
7	The vehicle distance from the preceding vehicle is short.	Y e s	N o
8	That was approximately 7 seconds period while the turn signal indicator was operating or after the lever was returned.	Y e s	N o
9	The vehicle has not returned inside the vehicle lane after the operation of the lane departure warning.	Y e s	N o
10	The width of the vehicle lane is narrow.	Y e s	N o
11	The vehicle lane is difficult to be recognized seen from the stereo camera. (The lane division line (white line, etc.) does not exist or is almost disappearing. Or the color of the lane division line is similar to that of the road surface, which is difficult to be recognized. Or the lane division line is narrow, etc.)	Y e s	N o
1	The preceding vehicle performed crash avoidance action to avoid the obstacle, and the	Y	N

	2	own vehicle performed steering operation after the preceding vehicle.	e s	o
2	Check that the following are applied to the condition that the lane departure warning OFF indicator light illuminates. (When the lane departure warning OFF indicator light illuminates, the lane departure warning does not operate.)			
	1	The lane departure warning is turned off, using the lane departure warning OFF switch.	Y e s	N o
	2	Approximately for 7 seconds after the engine has started.	Y e s	N o
	3	EyeSight is malfunctioning.	Y e s	N o
	4	EyeSight is stopped temporarily.	Y e s	N o
[2]: When lane departure warning operated improperly.				
1	Check that the following are applied to the condition that the vehicle lane is recognized erroneously and the lane departure warning may operate.			
	1	There was the tire track on the wet road or snow-covered road.	Y e s	N o
	2	There was the boundary line between snow-covered area and asphalt or on the trace of road repair.	Y e s	N o
	3	There was the double vehicle lane.	Y e s	N o
	4	The shadow of the guardrail was detected by mistake.	Y e s	N o
[3]: When sway warning did not operate.				
1	Check that the following are applied to the condition that the sway warning may not operate.			
	1	The vehicle drove on the road with many curves in succession.	Y e s	N o
	2	The vehicle speed changed greatly.	Y e s	N o
	3	That was immediately after the vehicle lane had changed.	Y e s	
	4	The vehicle lane was difficult to be recognized seen from the stereo camera.	Y	N

	(The lane division line (white line, etc.) does not exist or is almost disappearing. Or the color of the lane division line is similar to that of the road surface, which is difficult to be recognized. Or the lane division line is narrow, etc.)	e s	o
5	That was immediately after the sway had begun.	Y e s	N o
2	Check that the following are applied to the condition that the lane departure warning OFF indicator light illuminates. (When the lane departure warning OFF indicator light illuminates, the sway warning does not operate.)		
1	The lane departure warning is turned off, using the lane departure warning OFF switch.	Y e s	N o
2	Approximately for 7 seconds after the engine has started.	Y e s	N o
3	EyeSight is malfunctioning.	Y e s	N o
4	EyeSight is stopped temporarily.	Y e s	N o
[4]: When sway warning operated improperly.			
1	Check that the following are applied to the condition that the sway warning may operate.		
1	That was after the sway had stopped.	Y e s	N o
2	The driver lost concentration on driving the vehicle due to fatigue or looking away.	Y e s	N o
[5]: When the forward vehicle's start monitoring function did not operate or when it malfunctioned.			
1	Check that the following are applied to the condition that the forward vehicle's start monitoring function does not operate even when the preceding vehicle has already started, or the forward vehicle's start monitoring function operates even when the preceding vehicle has not yet started.		
1	The motorcycle cut in the space between the own vehicle and the stopped preceding vehicle.	Y e s	N o
2	The vehicle could not recognize the preceding vehicle properly due to the weather condition or road shape.	Y e s	N o
3	The stereo camera lost sight of the preceding vehicle.	Y e s	N o
4	The driver did not depress the brake pedal with select lever in D, M or N range.	Y	N

	(At this time, forward vehicle's start monitoring function does not operate.)	e	o
5	The forward vehicle's start monitoring function was turned OFF via the customization function.	Y	N
		e	o
		s	

10. CHECK LIST (ACTIVE LANE KEEP)



Item Name		Yes/	No
1	Check that the current status applies to the condition that use of lane keeping is not desired.		
1	An object was placed on the dashboard.	Y	N
		e	o
		s	
2	Tire pressure is not correct.	Y	N
		e	o
		s	
3	The vehicle is equipped with the temporary spare tire.	Y	N
		e	o
		s	
4	The vehicle is equipped with worn tire or tires with excessive wear difference.	Y	N
		e	o
		s	
5	The vehicle is equipped with the tires out of specification.	Y	N
		e	o
		s	
6	The flat tire is repaired using the temporary repair kit.	Y	N
		e	o
		s	
7	The suspension (including STI parts) has been modified.	Y	N
		e	o
		s	
8	Wheel balance is abnormal (balance weight falls off, slides off, etc.).	Y	N
		e	o
		s	
9	Wheel alignment is out of the specified value.	Y	N
		e	o
		s	
10	The steering wheel has been replaced with a non-genuine part.	Y	N
		e	o
		s	
11	The steering wheel is off-center.	Y	N
		e	o
		s	

1 2	The lighting devices, such as headlights and fog lights, have been modified.	Y e s	N o
1 3	An abnormal vibration can be felt on the steering wheel.	Y e s	N o
1 4	The steering wheel operation is heavier than usual.	Y e s	N o
1 5	An error occurs, for example, no display appears in the combination meter or no alarm sounds.	Y e s	N o
1 6	The headlight cannot illuminate the road surface sufficiently because the headlight is dirty, attached with ice, snow or mud, or the optical axis is deviated.	Y e s	N o
1 7	The driving status of own vehicle was unstable due to an accident or failure.	Y e s	N o
1 8	The vehicle carried heavy load.	Y e s	N o
1 9	Passenger capacity was exceeded.	Y e s	N o
2 0	The vehicle towed another vehicle.	Y e s	N o
2 1	The vehicle drove on a general road (other than limited highways).	Y e s	N o
2 2	The vehicle drove on a road with sharp curves, such as an urban highway.	Y e s	N o
2 3	The vehicle drove on a slippery road such as icy roads or snow-covered roads.	Y e s	N o
2 4	The vehicle drove on a lane restricted road or a temporary road due to road construction.	Y e s	N o
2 5	The vehicle drove on a road where obsolete white lines did not disappear completely.	Y e s	N o
2 6	On the road surface there were some snow, puddles, snow melting agent, cracks, road repair traces, obsolete white lines.	Y e s	N o


27	The vehicle entered the interchange, service area, parking area, junction or tollgate.	Y	N
		e	o
		s	
28	The vehicle drove on a road where the surrounding brightness (such as inlet and outlet of a tunnel) suddenly changed.	Y	N
		e	o
		s	
29	The vehicle drove on a road where there was some water or sandy dust raised by a preceding vehicle or oncoming vehicle, or sand or smoke blown in the wind, or moisture in front of own vehicle.	Y	N
		e	o
		s	
30	The windshield glass was covered with fog, snow, dirt, frost or sandy dust.	Y	N
		e	o
		s	
31	The raindrops, water drops or dirt on the windshield glass were not wiped off sufficiently.	Y	N
		e	o
		s	
32	Canoes etc. loaded on the roof block the visibility of the stereo camera.	Y	N
		e	o
		s	
33	The vehicle drove immediately after the stereo camera was replaced or adjusted.	Y	N
		e	o
		s	
2	Check that the current status applies to the condition or the object, such as a white line, that is hard to be recognized by the stereo camera.		
1	The vehicle drove when it was dark in the evening or in the morning.	Y	N
		e	o
		s	
2	The vehicle drove under the road condition, such as rainy or snowy weather, that the white line was difficult to be recognized.	Y	N
		e	o
		s	
3	The headlight did not illuminate during nighttime hours or inside the tunnel.	Y	N
		e	o
		s	
4	The vehicle was exposed to the intense light (backlight such as sunlight or headlight) from the front of the vehicle.	Y	N
		e	o
		s	
5	The vehicle drove on a road where the driving lane was yellow.	Y	N
		e	o
		s	
6	The vehicle drove on a road where the color of the lane division line was similar to the color of the road surface, which was difficult to be recognized.	Y	N
		e	o
		s	
7	The vehicle drove on a road where the width of the lane division line was narrow.	Y	N
		e	o
		s	
8	The vehicle drove on a road where the lane division line did not exist or almost	Y	N






	disappeared.	e s o
9	The vehicle drove on a road where the width of the driving lane was narrow.	Y e s N o
1 0	The vehicle drove on a road where there was a fork lane, such as an interchange outlet of the highway, or an intersection.	Y e s N o
1 1	The vehicle drove on a road where the surrounding brightness (such as inlet and outlet of a tunnel) suddenly changed.	Y e s N o
1 2	The vehicle drove on a road where the white line had a special shape, such as a double line.	Y e s N o
1 3	The vehicle drove under the condition that the white line was difficult to be recognized due to the short distance to the preceding vehicle.	Y e s N o
1 4	Another vehicle cut in ahead of the vehicle from the next lane, or the preceding vehicle changed the driving lane.	Y e s N o
1 5	The vehicle drove on a road where the curve shape changed suddenly.	Y e s N o
1 6	A shadow of the guardrail formed on the white line.	Y e s N o
3	Check that the current status applies to the condition that sufficient performance of lane keeping cannot be achieved.	
1	The vehicle was subjected to cross wind.	Y e s N o
2	The vehicle is equipped with winter tires or non-genuine tires.	Y e s N o
3	The vehicle drove on a uphill or a downhill where the road surface gradient suddenly changed.	Y e s N o
4	The vehicle drove on an uneven, rolling or jointed road surface.	Y e s N o
5	The vehicle drove on a road where the road surface cross gradient changed suddenly or was large.	Y e s N o
6	The acceleration or deceleration speed was large.	Y e s N o






			s	
7	The vehicle drove immediately after the tire was replaced or the tire air pressure was changed.		Y e s	N o
8	The vehicle drove immediately after the vehicle weight was extremely changed.		Y e s	N o
9	The vehicle drove immediately after the stereo camera was repaired, adjusted or replaced.		Y e s	N o
10	The vehicle drove immediately after the suspension or steering system was repaired or replaced.		Y e s	N o
11	The vehicle drove immediately after the engine was started at a low outside temperature.		Y e s	N o







EyeSight (DIAGNOSTICS) > ECM Cancel Code(s) Display




LIST

Cancel Code	Item	Contents of diagnosis	Note
11	Main Switch	Main switch of the EyeSight steering switch is turned to OFF, and the cruise control is released.	This code is displayed without operating the main switch.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>11.
12	Stop & Brake switch	Stop light switch or brake switch is turned to ON, and then the cruise control is released.	This DTC is displayed without depressing the brake pedal.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>12.
14	Neutral Position Switch	Neutral position switch is turned to ON, and then the cruise control is released.	This code is displayed without shifting to neutral position.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>14.
15	Cancel switch	Cancel switch is turned to ON, and then the cruise control is released.	This DTC is displayed without operating the cancel switch.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>15.
16	Ignition Switch	Ignition switch is turned to OFF, and then the cruise control is released.	This DTC is displayed without operating the

			ignition switch.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>16.
21	Abnormality of switches when Ignition switch on	When the ignition switch is turned to ON, each switch of the EyeSight steering switch is already turned ON.	This code is displayed when turning ignition switch to ON without operating the EyeSight steering switch.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>21.
22	Abnormality of change in vehicle speed	Malfunction of vehicle speed signal variation is detected.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>22.
24	Abnormality of switches related to cruise control	Open circuit of the EyeSight steering switch is detected during cruise driving. (The system is judged as model without cruise control.)	This DTC is displayed with normal operation.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>24.
31	Engine Speed	<ul style="list-style-type: none"> Abnormal increase of engine speed is detected. Gear is placed in Neutral, 1st or Reverse position. 	Cruise in 2nd shift position or more.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>31.
32	Cruise Control out of Range	<ul style="list-style-type: none"> Vehicle speed exceeds the controllable range during cruising. Set operation was performed at vehicle speed unavailable for setting. RESUME operation was performed without memorized vehicle speed. 	This DTC is displayed, though the vehicle speed is increased to the speed available for cruise set and set operation was

			performed again.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>32.
34	Prohibition of cruise control at continuing big Accel. angle	The vehicle has been driven at higher speed than set vehicle speed for an abnormally long time (approximately 10 minutes) during cruise driving.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>34.
35	Prohibition of cruise control at vehicle speed F/B malfunction	Set vehicle speed cannot be kept because of some reasons (steep uphill, parking brake, abnormal decrease of engine output, etc.) during cruise driving.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>35.
41	VDC/TCS Operating	Vehicle dynamics control (VDC), TCS or EPB is operated during cruise driving or cruise setting.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>41.
43	ABS/VDC Failure	When the cruise switch is ON, ABS or vehicle dynamics control (VDC) system malfunction is detected.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>43.
44	Body Integrated unit Failure	When the cruise switch is ON, body integrated unit system malfunction is detected.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>44.
45	Meter Failure	When the cruise switch is ON, combination meter malfunction is detected.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>45.
47	Adaptive cruise control ECM abnormal	When the cruise switch is ON, stereo camera malfunction is detected.	Check the DTCs related to stereo camera.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Code(s) Display.
49	TCM Failure	Transmission control module (TCM) malfunction is detected during cruise driving	 Ref. to EyeSight (DIAGNOSTICS)>Di

		or cruise setting.	agnostic Procedure with ECU Cancel Code>49.
53	Adaptive cruise control compulsory cancellation	Stereo camera detects the release command of the cruise control during cruise driving or cruise setting operation.	Check the stereo camera.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Code(s) Display. Check the ACC cancel code.  Ref. to EyeSight (DIAGNOSTICS)>ACC Cancel Code(s) Display.
54	Release SW	Brake control module detects the brake pedal operation by the driver during cruise driving or cruise setting operation.	If this code is detected when the brake pedal is not depressed intentionally, check the release switch.
55	Adaptive cruise control reception data abnormal	When the cruise switch is ON, malfunction is detected in the reception data from the stereo camera.	Check the cancel code of stereo camera.  Ref. to EyeSight (DIAGNOSTICS)>ACC Cancel Code(s) Display.
61	Brake Switch Failure	Malfunction in the stop light & brake switch is detected.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>61.
62	Neutral Switch Failure	Neutral position switch malfunction is detected.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>62.
63	Abnormality 1 of change in vehicle speed	Malfunction of vehicle speed signal variation is detected. This code may be displayed by a sudden starting of the vehicle on a road with low μ and with the VDC OFF. In this case, restart the engine and perform the cruise setting	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>63.

		again. If the cancel code is not displayed, the vehicle is in normal status.	
64	Engine Sensor Failure 1	Malfunction related to engine is detected.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>64.
65	Abnormality 1 of switches related to cruise control	Malfunction of the EyeSight steering switch is detected. (When the switch is pressed ON for a long time (approximately two minutes), stuck ON condition is detected.)	Check EyeSight steering switch.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>65.
66	Cruise Control Calculation Error	Cruise control calculation (microcomputer) malfunction is detected.	 Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>66.

EyeSight (DIAGNOSTICS) > ECM Cancel Code(s) Display

OPERATION

1. On [Main Menu] display, select [Each System].
2. On [Select System] display, select [Engine Control System].
3. Drive vehicle at 40 km/h (25 MPH) or more and set the cruise control.

Caution:

- **When performing diagnosis, observe the legal speed limit on the road.**
- **The cancel code will also appear when the cruise control is cancelled by the driver's operation. Do not confuse them.**
- **Be sure to get an assistant to support the diagnosis while driving, and have him/her operate the select monitor.**

4. When the set speed is canceled by itself (without any cancel operations such as applying brake) or when the cruise control could not be set by performing the setting operation, select [Cancel Code(s) Display] on the engine malfunction diagnosis screen.


Note:

The [Current] and [The past] are contained in the cancel code. The latest code recognized during current test drive is displayed in [Current]. Cancel codes resulting from fault diagnosis of switches relating to the system and cruise control are also displayed in [The past].

5. Perform Engine Clear Memory operation.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#)  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Clear Memory Mode.](#)

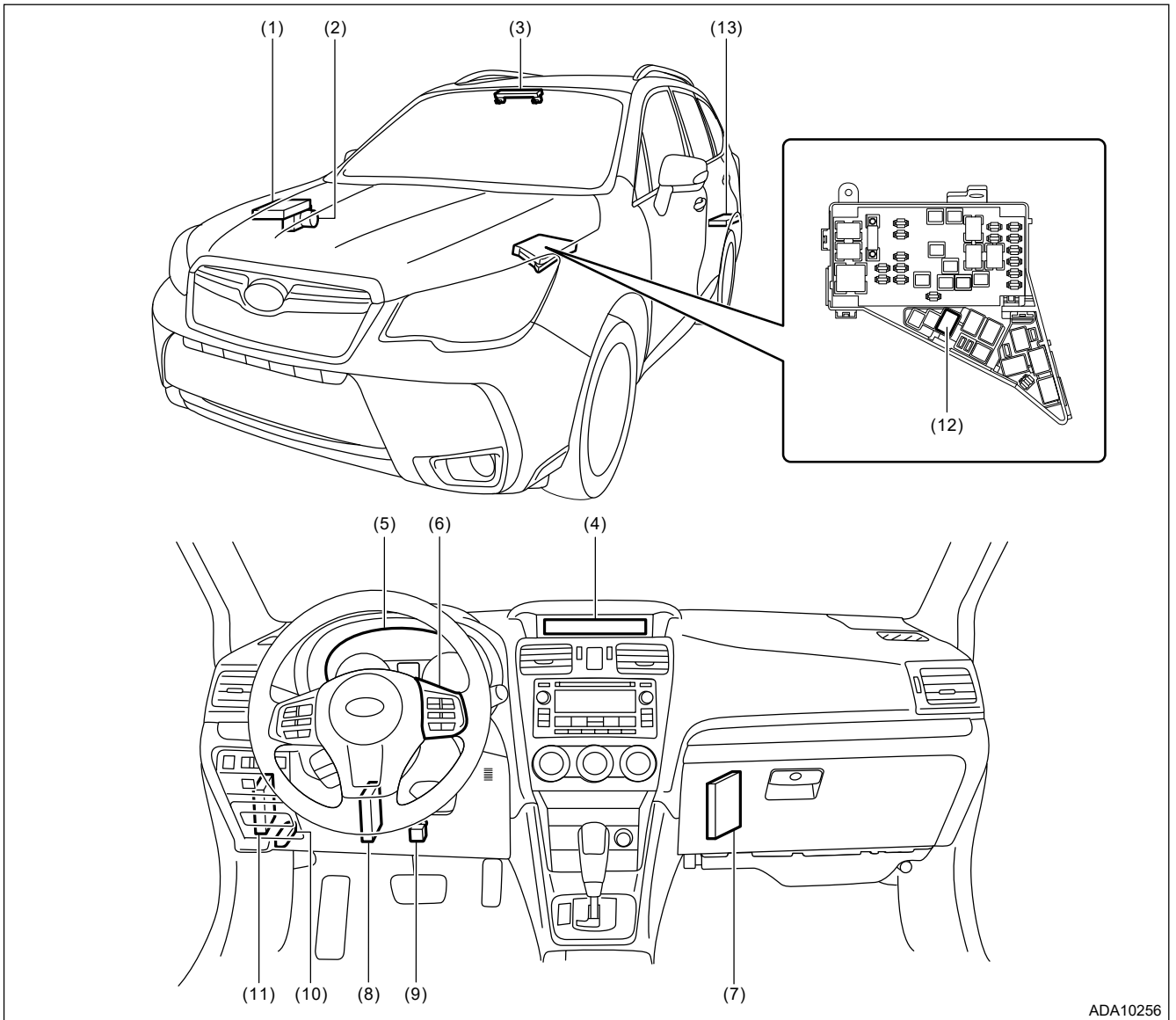
Cancel codes for switches relating to the system and cruise control are deleted by clearing memory on the engine side.

Note:

- **For detailed operation procedures, refer to "Application help".**
- **The latest code will be cleared by turning ignition switch to OFF.**
- **For details on cancel codes, refer to List of ECM cruise control cancel code.**
 [Ref. to EyeSight \(DIAGNOSTICS\)>ECM Cancel Code\(s\) Display>LIST.](#)

LOCATION

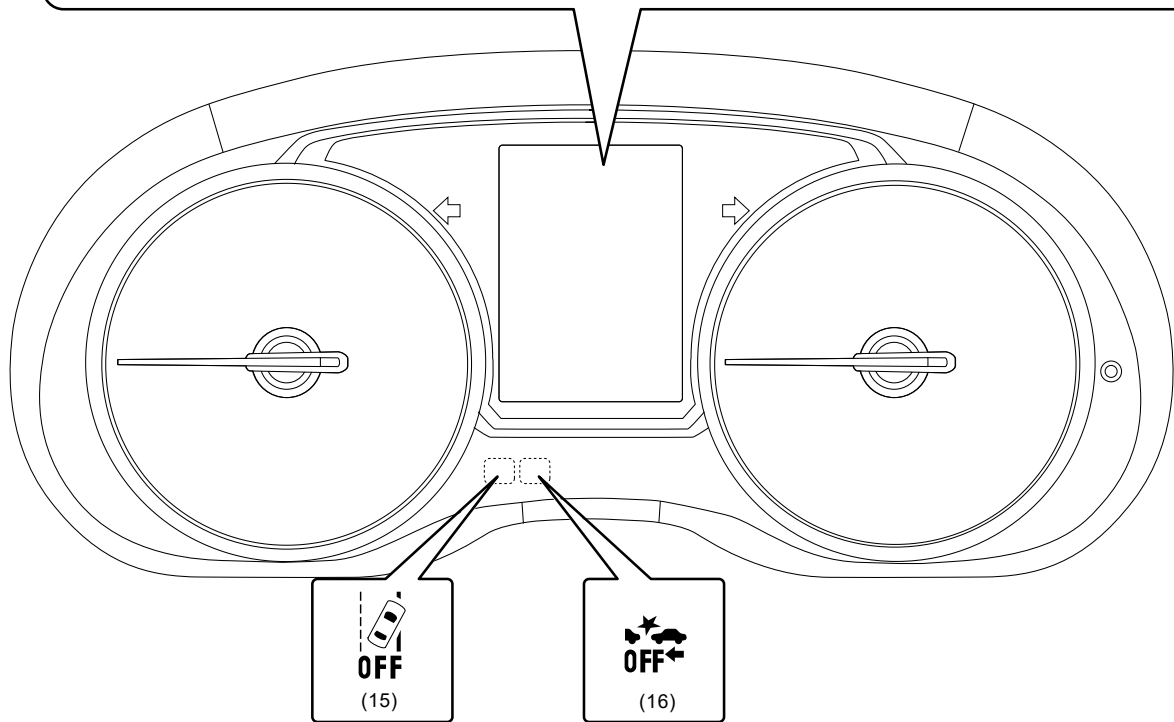
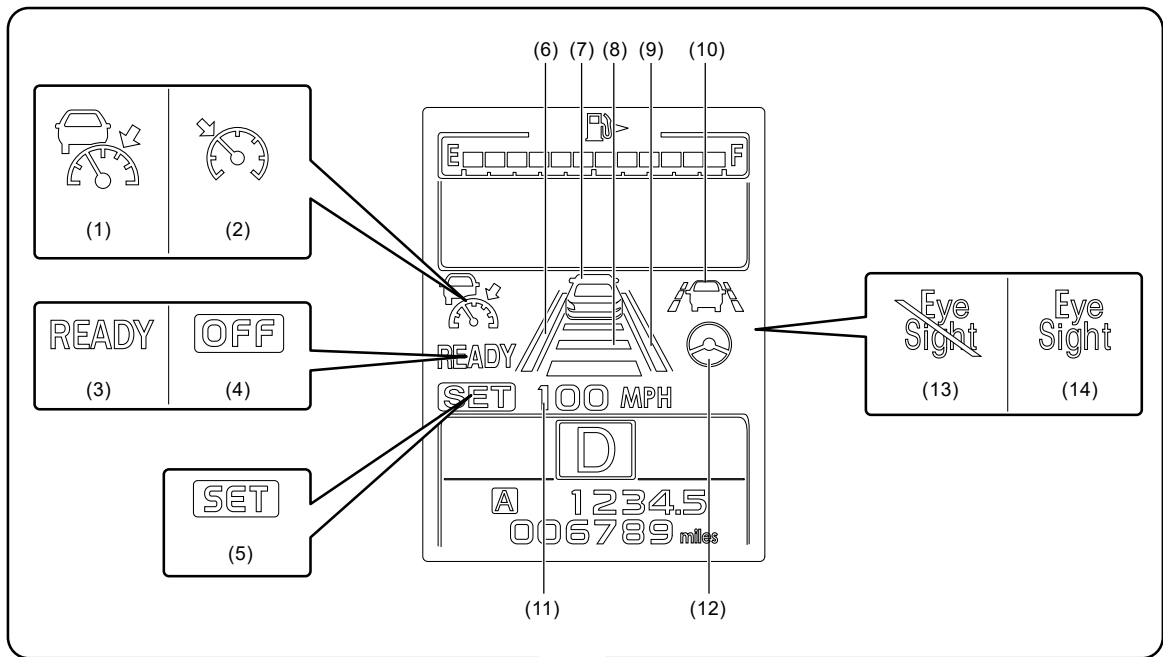
1. EyeSight SYSTEM



ADA10256

- | | | |
|---|---|---------------------------|
| (1) Engine control module (ECM) (turbo model) | (6) EyeSight steering switch | (10) Data link connector |
| (2) VDC control module (VDCCM) | (7) Engine control module (ECM) (non-turbo model) | (11) Body integrated unit |
| (3) Stereo camera | (8) Transmission control module (TCM) | (12) Brake light relay |
| (4) MFD (multi-function display) | (9) Stop light and brake switch | (13) RAB CM |
| (5) Combination meter | | |

2. COMBINATION METER

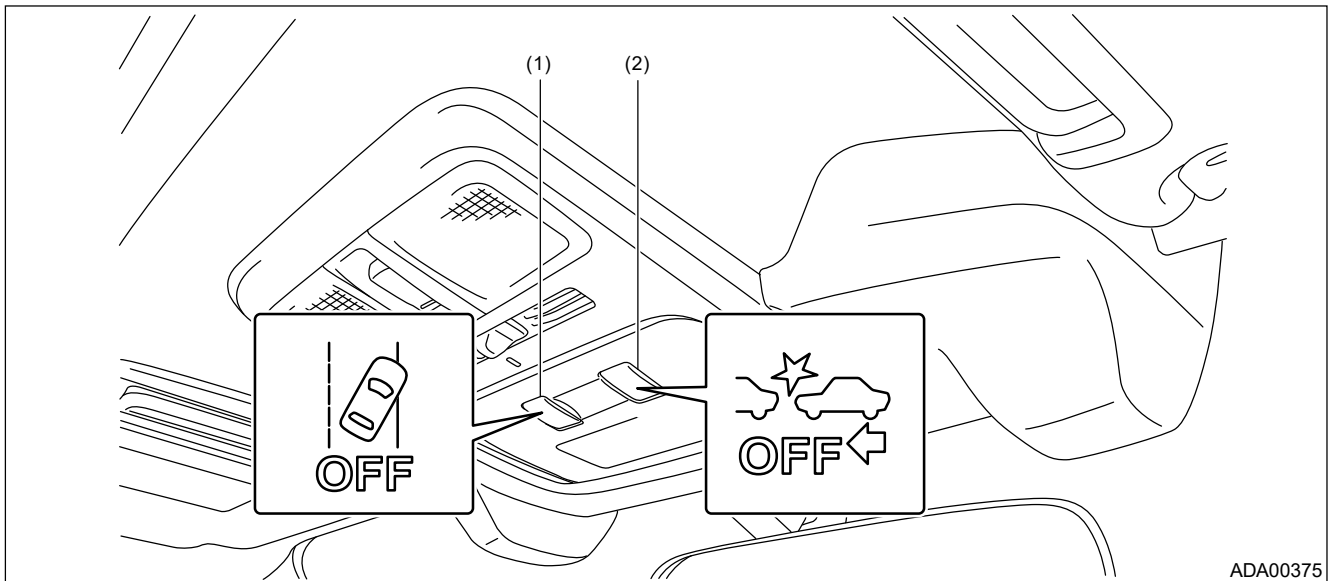


ADA10201

- | | | |
|---------------------------------|--|---|
| (1) Adaptive cruise display | (7) Preceding vehicle indicator | (12) Steering wheel indicator |
| (2) Conventional cruise display | (8) Following distance setting indicator | (13) EyeSight temporary stop indicator |
| (3) READY indicator | (9) Lane indicator (right) | (14) EyeSight warning indicator |
| (4) OFF indicator | (10) Lane keep display | (15) Lane departure warning OFF indicator light |
| (5) SET indicator | (11) Set vehicle speed display | (16) Pre-collision brake OFF indicator light |

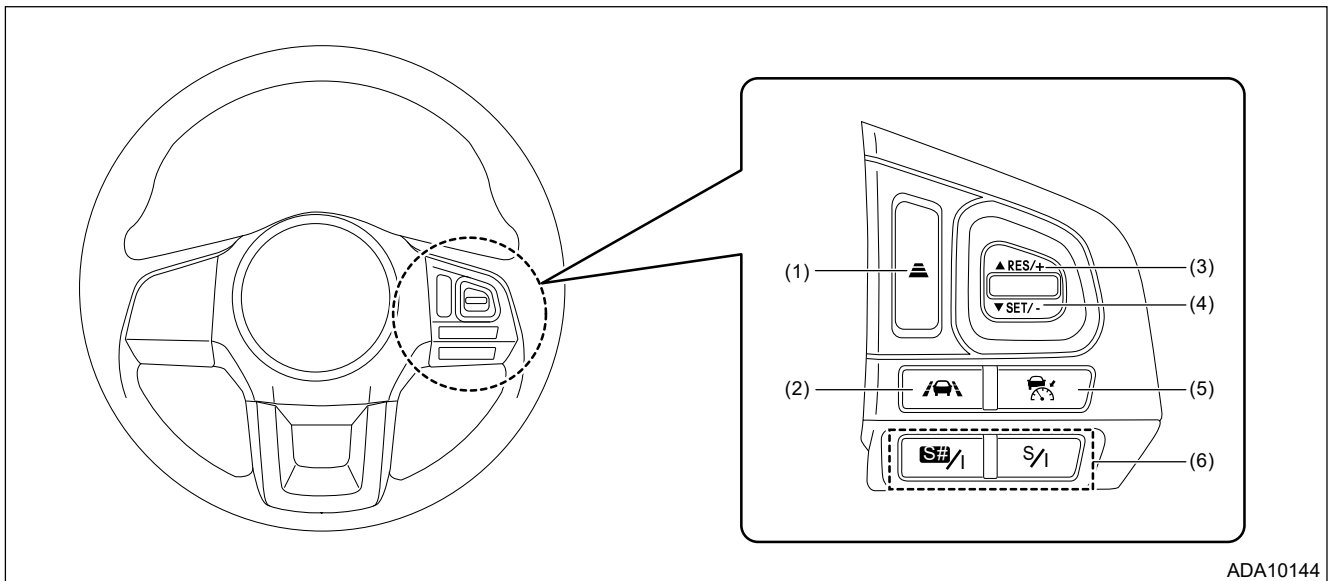
(6) Lane indicator (left)

3. SWITCH



(1) LDP OFF Switch

(2) Pre-Collision OFF Switch



(1) Following distance setting switch

(3) RES/+ (Resume/) switch

(5) CRUISE switch

(2) Lane keep switch





(4) SET/- (Set/) switch






(6) SI-DRIVE switch






EyeSight (DIAGNOSTICS) > EyeSight Temporary Code(s) Display

LIST

1. LIST OF EyeSight TEMPORARY STOP CODE

EyeSight HALT Code	Item	Contents of diagnosis	Note
E5	Stereo Camera Temporary Stop	The operation stopped temporarily due to vertical deviation of the optical axis of the stereo camera. (During CRUISE MAIN ON, "Temporary stop" is displayed in the multi-information display.)	<p>Perform inspection concerning the item for E5 of the "CHECK LIST (CAMERA TEMPORARY STOP)".  Ref. to EyeSight (DIAGNOSTICS)>EyeSight Temporary Code(s) Display>LIST > CHECK LIST (CAMERA TEMPORARY STOP).</p> <p>This code may be displayed when the rear of the vehicle is lowered by the overload. When the failure is resolved, and the operation returns from the temporary stop status after driving for a while, it is normal. If this item is displayed in an ordinary use under which the vehicle is not tilted, readjust the stereo camera.  Ref. to EyeSight>Camera Adjustment, Inspection>PROCEDURE.</p> <p>If the same cancel code is still detected after readjustment, replace the stereo camera.  Ref. to EyeSight>Stereo Camera>REMOVAL.</p>
CC			
CD		Temporary stop was performed due to the bad weather, backlight, fogged window or dirty window interfering with the recognition function of the stereo camera. And also when the front of the camera is blocked by the hand or when it is very dark around the vehicle or when the vehicle is surrounded by the blanket of snow and nothing can be seen from the stereo camera, this code may be	<p>Investigate the following items No. 1 and No. 2, and check that the possible cause of the temporary stop is applied either to No. 1 or No. 2.</p> <p>1. Perform inspection concerning the item for CC and CD of the "CHECK LIST (CAMERA TEMPORARY STOP)".  Ref. to EyeSight (DIAGNOSTICS)>EyeSight Temporary Code(s) Display>LIST > CHECK LIST (CAMERA TEMPORARY STOP).</p> <p>When there is a relevant item in the check list, it can be the cause of malfunction.</p>

	<p>displayed. (During CRUISE MAIN ON, "Temporary stop Camera view defectiveness" is displayed in the multi-information display.)</p>	<p>2. Read the temporary stop count stored in the temporary stop count of current data, and check the cause of the temporary stop occurred in the past from "LIST OF CONTENTS FOR CAMERA TEMPORARY STOP: 0 – 23 COUNTS".  Ref. to EyeSight (DIAGNOSTICS)>EyeSight Temporary Code(s) Display>LIST > LIST OF CONTENTS FOR CAMERA TEMPORARY STOP.</p> <p>When the causes of the temporary stop for No. 1 and No. 2 correspond, drive the vehicle for a while after the cause of the temporary stop has been eliminated. If the operation returns from the temporary stop status, it is normal. (However, when the occurrence and cancellation••• of the temporary stop take place repeatedly, the temporary stop status is held to prevent the irritation, delaying the return of the operation.) When this is not the case, check the stereo camera and its periphery.  Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION > WINDSHIELD GLASS AND DASHBOARD.  Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION > FRONT WIPER.  Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION > STEREO CAMERA.</p>
CE	<p>The temperature of the stereo camera became excessively high or low, and the operation stopped temporarily. (During CRUISE MAIN ON, "Temporary stop Camera temperature range outside" is displayed in the multi-information display.)</p>	<p>Perform inspection concerning the item for CE of the "CHECK LIST (CAMERA TEMPORARY STOP)".  Ref. to EyeSight (DIAGNOSTICS)>EyeSight Temporary Code(s) Display>LIST > CHECK LIST (CAMERA TEMPORARY STOP).</p> <p>When the failure is resolved, and the operation returns from the temporary stop status, it is normal. When the operation does not return from the</p>

			temporary status even if driving the vehicle for a while after the failure has been resolved, replace the stereo camera.  Ref. to EyeSight>Stereo Camera>REMOVAL.
33		Detected when engine speed is 300 rpm or less. (Not detected at initial ignition switch ON.) (During CRUISE MAIN ON, "Temporary stop" is displayed in the multi-information display.)	Detected when the engine speed drops below 300 rpm after the engine has started once. If the same EyeSight temporary stop code is detected again when the engine is restarted, check the ECM.  Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Basic Diagnostic Procedure>PROCEDURE.  Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure.
C0	Pre-Collision Second Braking Activation	Because the pre-collision secondary brake operated three times between engine starting and stopping, the temporary stop is performed. (This is not a normal driving operation, or the system may be malfunctioning.) (During CRUISE MAIN ON, "Temporary stop" is displayed in the multi-information display.)	This code may be displayed when the pre-collision brake is operated intentionally. Turn the ignition switch to OFF, and restart after a while. If the operation returns from the temporary stop status, it is normal. When temporary stop status continues with a code other than C0 after restart, perform diagnosis according to the code. When temporary stop status continues with the code of C0 after restart, the stereo camera may be malfunctioning. Replace the stereo camera.  Ref. to EyeSight>Stereo Camera>REMOVAL.
A0	CAN Diagnosis	The voltage dropped below 10 V immediately after IGN ON. (During CRUISE MAIN ON, "Temporary stop" is displayed in the multi-information display.)	This code may be displayed when the engine is not started for a while with the ignition switch ON and when the engine has started after that. This is a normal operation. If this is not the case, the supply voltage may be malfunctioning.  Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2814 POWER SUPPLY LOW VOLTAGE.
A1	ECM Reprogramming	Because the control module (CM) is being reprogrammed, temporary	After the completion of the reprogramming operation, turn the ignition to OFF and restart. If the

		stop is performed. (During CRUISE MAIN ON, "Temporary stop" is displayed in the multi-information display.)	operation returns from the temporary stop status, it is normal.
F9	EPS Input Control Suspended	The operation stopped temporarily because an assist limitation (overheat prevention control) was operated in order to prevent the electric power steering malfunction due to overheat.	This code may be displayed when the steering wheel is operated repeatedly while the vehicle is stopped or running in very low speed. After stopping the engine, leave the vehicle for approximately 30 minutes to cool down, and restart the engine. If the operation returns from the temporary stop status, it is normal.
		The operation stopped temporarily because of an electric power steering voltage decrease.	This code may be displayed when battery power is low. Replace or charge the battery, and restart the engine. If the operation returns from the temporary stop status, it is normal.
		The operation stopped temporarily because of an electric power steering bus off.	Electric power steering detected a failure and was disconnected from CAN line.

2. CHECK LIST (CAMERA TEMPORARY STOP)

Even when the set status of the adaptive cruise control is canceled or when a temporary stop status occurs, the EyeSight temporary stop code will not be retained for the following conditions.

- When the VDC operation is stopped by pressing the VDC OFF switch
- When the pre-collision brake operation is stopped by pressing the pre-collision brake OFF switch
- When the lane departure warning is stopped by pressing the lane departure warning OFF switch
- Immediately after the engine start

When these cases does not apply but the EyeSight temporary stop code is displayed, perform the inspection according to the following items.



Item Name		Yes/No	
[1]: EyeSight temporary stop code [CC, CD] (At this time, "Temporary stop Camera view defectiveness" is displayed in the multi-information display.)			
1	Check that the following are applied to the conditions that are difficult to be recognized by the stereo camera.		
1	It was bad weather (heavy rain, snowstorm, dense fog; especially when the oil film adheres to the windshield glass, the glass coating agent is used, or when the old wiper is used).	Y e s	N o

2	The vehicle was exposed to the intense light (backlight such as sunlight or headlight high-beam light) from the front of the vehicle.	Y e s	N o
3	The raindrops, water drops or dirt on the windshield glass are not wiped off sufficiently.	Y e s	N o
4	The windshield glass is covered with fog, snow, dirt, frost or sandy dust, and either of them blocks the visibility of the stereo camera.	Y e s	N o
5	The vehicle was tilted excessively by the heavy load.	Y e s	N o
6	Canoes etc. loaded on the roof blocked the visibility of the stereo camera.	Y e s	N o
7	The field of view was insufficient due to water or snow raised by the preceding vehicle or oncoming vehicle, or the moisture, sand, smoke or sandy dust blown in the wind.	Y e s	N o
8	The vehicle passed through the outlet or inlet of a tunnel.	Y e s	N o
9	The rearmost area of preceding vehicle was small (trailer, etc.), low or uneven.	Y e s	N o
1 0	The object was a fence or wall with even pattern (striped pattern or bricks) or unpatterned surface.	Y e s	N o
1 1	The object was a plate of glass, mirror wall or door.	Y e s	N o
1 2	The tail light of the preceding vehicle did not illuminate during nighttime hours or inside the tunnel.	Y e s	N o
1 3	The vehicle passed through the banners, flags, drooping branches or grass.	Y e s	N o
1 4	The vehicle drove on the steep uphill or steep downhill.	Y e s	N o
1 5	Front of the camera was blocked by the hand.	Y e s	N o
1 6	It was very dark and there was no obstacle around the vehicle.	Y e s	N o

17	The surrounding ground surface was similarly colored. (There is snow as far as the eye can see.)	Y e s	N o
18	Dirt such as fingerprint adhered to the lens portion of the stereo camera.	Y e s	N o
19	Stable recognition was difficult because of reflection to the windshield glass.	Y e s	N o
20	The stereo camera was subject to impact, and the displacement or distortion occurred.	Y e s	N o
[2]: EyeSight temporary stop code [CE] (At this time, "Temporary stop Camera temperature range outside" is displayed in the multi-information display.)			
1	Check that the following is applied to the condition that the temperature of the stereo camera becomes excessively high or low.		
1	The compartment temperature was high. (For example: The vehicle was left under the scorching sun.) Or the compartment temperature was low. (For example: The vehicle was left under the frigid environment.)	Y e s	N o
[3]: EyeSight temporary stop code [E5] (At this time, "Temporary stop" is displayed in the multi-information display.)			
1	Check that the following are applied to the condition that the vertical deviation of the optical axis of stereo camera occurs.		
1	The vehicle was tilted excessively by the heavy load.	Y e s	N o
2	The vehicle drove on the steep uphill or steep downhill.	Y e s	N o
3	The stereo camera was subject to impact, and the displacement or distortion occurred.	Y e s	N o
[4]: EyeSight temporary stop code [33] (At this time, "Temporary stop" is displayed in the multi-information display.)			
1	Check that the current status applies to the condition that the engine speed drops to 300 rpm or below.	Y e s	N o
[5]: EyeSight temporary stop code [C0] (At this time, "Temporary stop" is displayed in the multi-information display.)			
1	Check that the current status applies to the condition that the pre-collision secondary brake operated three times between starting and stopping of engine.	Y e s	N o
[6]: EyeSight temporary stop code [A0] (At this time, "Temporary stop" is displayed in the multi-information display.)			
1	Check that the current status applies to the condition that the voltage dropped below 10 V	Y	N

	immediately after the ignition ON.	e	o
		s	
[7]: EyeSight temporary stop code [A1] (At this time, "Temporary stop" is displayed in the multi-information display.)			
1	Check that the control module (CM) is currently being reprogrammed.	Y	N
		e	o
		s	
[8]: EyeSight temporary stop code [F9] (At this time, "Temporary stop" is displayed in the multi-information display.)			
1	Check that the current status applies to the condition that the steering wheel is operated repeatedly when the vehicle stops or moves very slowly.	Y	N
		e	o
		s	

3. LIST OF CONTENTS FOR CAMERA TEMPORARY STOP

Read the camera temporary stop count from Current Data Display & Save of Subaru Select Monitor, estimate the possible cause of the temporary stop according to the chart below. (After clearing the memory, the number of occurrence for each temporary stop is accumulated.)

Items to be displayed	Main causes	Possible conditions for temporary stop (including events occurring less frequently)
EyeSight Temporary 0 Count	Front of the camera is blocked by hand, dirty window glass	Backlight, dirty window glass, fogged window glass, frost on the window glass, oil film on the window glass, raindrop adhering to the window glass, fingerprint adhering to the lens, deteriorated wiper, front of the camera is blocked by hand, bad weather (heavy rain, snowstorm, dense fog), unpatterned wall, water or snow raised by preceding vehicle
EyeSight Temporary 1 Count	Front of the camera is blocked by hand, dirty window glass	Backlight, dirty window glass, fogged window glass, frost on the window glass, oil film on the window glass, raindrop adhering to the window glass, fingerprint adhering to the lens, deteriorated wiper, front of the camera is blocked by hand, bad weather (heavy rain, snowstorm, dense fog), water or snow raised by preceding vehicle, very dark and no obstacle around the vehicle, unpatterned wall, blanket of snow around the vehicle and no obstacle is found
EyeSight Temporary 2 Count	Fogged window glass, frost on the window glass	Dirty window glass, fogged window glass, frost on the window glass, oil film on the window glass, raindrop adhering to the window glass, fingerprint adhering to the lens, deteriorated wiper, front of the camera is blocked by hand, bad weather (heavy rain, snowstorm, dense fog), unpatterned wall, water or snow raised by preceding vehicle
EyeSight Temporary 3 Count	Backlight	Backlight, dirty window glass, fogged window glass, frost on the window glass, oil film on the window glass, raindrop adhering to the window glass, fingerprint adhering to the lens, deteriorated wiper, bad weather (heavy rain, snowstorm, dense fog), unpatterned wall, water or snow raised by preceding vehicle

EyeSight Temporary 4 Count	Water raised by preceding vehicle	Backlight, dirty window glass, fogged window glass, frost on the window glass, oil film on the window glass, raindrop adhering to the window glass, fingerprint adhering to the lens, deteriorated wiper, front of the camera is blocked by hand, bad weather (heavy rain, snowstorm, dense fog), unpatterned wall, water or snow raised by preceding vehicle, use of the window washer
EyeSight Temporary 5 Count	Dirty window glass, fogged window glass, oil film on the window glass	Dirty window glass, fogged window glass, frost on the window glass, oil film on the window glass, raindrop adhering to the window glass, fingerprint adhering to the lens, deteriorated wiper, bad weather (heavy rain, snowstorm, dense fog), water or snow raised by preceding vehicle
EyeSight Temporary 6 Count	Storm of rain	Dirty window glass, fogged window glass, frost on the window glass, oil film on the window glass, raindrop adhering to the window glass, fingerprint adhering to the lens, deteriorated wiper, bad weather (heavy rain, snowstorm, dense fog), water or snow raised by preceding vehicle, use of the window washer
EyeSight Temporary 7 Count	Object on the dashboard reflected against the windshield glass	Object on the dashboard reflected against the windshield glass, snowstorm
EyeSight Temporary 8 Count	Dirty window glass, bad weather	Backlight, dirty window glass, fogged window glass, frost on the window glass, oil film on the window glass, raindrop adhering to the window glass, fingerprint adhering to the lens, deteriorated wiper, front of the camera is blocked by hand, object on the dashboard reflected against the windshield glass, bad weather (heavy rain, snowstorm, dense fog), unpatterned wall, water drop raised by preceding vehicle, steep slope, continuous sharp curve, banner, grass, preceding vehicle with large uneven surface (trailer, etc.), preceding vehicle driving in the night without illuminating the tail light, preceding vehicle with snow adhered, use of the window washer
EyeSight Temporary 9 Count	Not used	—
EyeSight Temporary 10 Count	Not used	—
EyeSight Temporary 11 Count	Not used	—
EyeSight Temporary 12 Count	Camera has been deformed by hitting it.	The stereo camera was subject to impact, and the displacement or distortion occurred.
EyeSight Temporary	Not used	—

13 Count		
EyeSight Temporary 14 Count	Not used	—
EyeSight Temporary 15 Count	Not used	—
EyeSight Temporary 16 Count	Not used	—
EyeSight Temporary 17 Count	Not used	—
EyeSight Temporary 18 Count	Not used	—
EyeSight Temporary 19 Count	Not used	—
EyeSight Temporary 20 Count	Not used	—
EyeSight Temporary 21 Count	The vehicle is tilted excessively by the heavy load.	<ul style="list-style-type: none"> • The vehicle is tilted excessively by the heavy load. • The vehicle drives on the steep uphill or steep downhill. • The stereo camera was subject to impact, and the displacement or distortion occurred.
EyeSight Temporary 22 Count	Camera has been deformed by hitting it.	The stereo camera was subject to impact, and the displacement or distortion occurred.
EyeSight Temporary 23 Count	Camera has been deformed by hitting it.	The stereo camera was subject to impact, and the displacement or distortion occurred.
EyeSight Temporary 24 Count	Camera has been deformed by hitting it.	The stereo camera was subject to impact, and the displacement or distortion occurred.
EyeSight Temporary 25 Count	Camera has been deformed by hitting it.	The stereo camera was subject to impact, and the displacement or distortion occurred.
EyeSight Temporary 26 Count	Dirty window glass left for a long time	Dirty window glass, fogged window glass, frost on the window glass, raindrop adhering to the window glass, fingerprint adhering to the lens
EyeSight Temporary 27 Count	Not used	—
EyeSight Temporary 28 Count	Can't see anything in a complete darkness.	The vehicle drove in a complete darkness with the headlight turned off. Or, the camera was blinded when driving.
EyeSight Temporary 29 Count	Not used	—
EyeSight Temporary 30 Count	Not used	—
EyeSight Temporary	In a high	—

31 Count

temperature of
70°C (158°F)
or more or in a
low
temperature of
–10°C (14°F)
or less


EyeSight (DIAGNOSTICS) > EyeSight Temporary Code(s) Display

OPERATION

If the EyeSight pause code is detected from the stereo camera, all the functions of the EyeSight excluding the conventional cruise control stop temporarily and cannot be used. When the failure is resolved, the function starts operating.

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [EyeSight], and then select [Enter].
5. On [Select Function] display, select [Cancel Code].
6. On [Cancel Code] display, select [EyeSight HALT Code].

Note:

- For detailed operation procedures, refer to "Application help".
- Temporary stop is not released even if the lane departure warning OFF switch or pre-collision brake OFF switch is pressed.
- Depending on the situation, temporary stop may not be released even if the ignition switch is turned off.
- Up to 20 codes can be stored.
- Stored codes will be cleared by Clear Memory.
- For details on EyeSight temporary stop codes, refer to List of EyeSight temporary stop code.  [Ref. to EyeSight \(DIAGNOSTICS\)>EyeSight Temporary Code\(s\) Display>LIST.](#)

EyeSight (DIAGNOSTICS) > Freeze Frame Data Display

LIST



Display	Description	Unit
ECU Power Supply Voltage (IG)	Display of input voltage of stereo camera	V
Engine Speed	Engine speed	rpm
Accel. Opening Angle	Acceleration opening angle signal	%
Brake Fluid Target Pressure	Target value of brake fluid pressure	MPa
Master Cylinder Actual Fluid Pressure	Brake pressure	[MPa]
Right Front Wheel W/C Actual Fluid Pressure	Right front wheel cylinder fluid pressure	MPa
Left Front Wheel W/C Actual Fluid Pressure	Left front wheel cylinder fluid pressure	MPa
Brake SW Input	Brake switch signal status	—
Brake Lamp SW (BIU)	Brake light switch signal status	—
Brake Lamp SW (VDC)	Brake light switch status	—
Under Auto Start Stop control	Under Auto Start Stop control signal	—
Trip Count [count]	Timestamp information_trip counter	Time
Count	Timestamp information_original count identification information	—
Time Count [msec]	Timestamp information_time counter	ms
Drive Wheel Average Speed	Wheel speed average speed signal	km/h
Brake Lamp Command	Brake lamp light up command signal	—
Driver Brake Detection	Driver brake detection signal	—
Brake control actuate	Brake operation permission signal	—
Pre-Collision Brake Assist Command	Pre-collision brake assist command signal	—
Pre-Collision Brake Action	Pre-collision brake command signal	—
Risk Avoidance Assist standby Command	Risk avoidance assist stand-by command signal	—
Adaptive Cruise Control Torque Down	Torque down prohibition signal of stereo camera	—
Hill Descent Control Status	Hill descent control status signal	—
Engine Failure	Engine failure signal	—
Brake Lamp SW Fail Status	Brake light switch failure signal	—

EyeSight (DIAGNOSTICS) > Freeze Frame Data Display

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [EyeSight], and then select [Enter].
5. On [Select Function] display, select [DTC].
6. On [DTC] display, select [FFD].

Note:

- For detailed operation procedures, refer to “Application help”.
- Freeze frame data is stored for three DTCs. Allocation of the three DTCs are as follows:
 - DTC that occurred first.
 - DTC that occurred first during the latest driving cycle (from IGN ON to IGN OFF).
 - DTC that occurred first during the second latest driving cycle.
 - However, DTCs will be stored in order of occurrence until these three DTCs are stored.
- For details on freeze frame data, refer to List of freeze frame data.  [Ref. to EyeSight \(DIAGNOSTICS\)>Freeze Frame Data Display>LIST.](#)
- Freeze frame data is cleared by Clear Memory.  [Ref. to EyeSight \(DIAGNOSTICS\)>Clear memory.](#)

CAUTION

1. AIRBAG SYSTEM


Airbag system wiring harness is routed near the cruise control command switch.

Caution:

- **Do not use the electrical test equipment on the airbag system wiring harnesses and connector circuits.**
- **Be careful not to damage the airbag system wiring harness when servicing the cruise control command switch.**



2. EyeSight

Caution:

- **Do not hold the camera unit of the stereo camera.**
- **Do not touch the lens on the stereo camera.**
- **Do not clean the lens of the stereo camera.**
- **When cleaning the windshield glass, use care so that the glass cleaner, etc. does not come in contact with the lens of the stereo camera.**
- **Do not make an impact or apply excessive force to the stereo camera.**
- **Do not disassemble the stereo camera.**
- **Do not change the installation position of the stereo camera or do not modify the surrounding structure.**
- **If the stereo camera or windshield glass is removed or replaced, always adjust or check the stereo camera.**
- **When lifting up the vehicle to rotate the tires, turn off the pre-crash function.**
- **Stereo camera axis may be displaced even in a minor collision. So be sure to adjust the stereo camera even when the EyeSight warning light is not illuminated or when the "Stereo Camera Temporary Stop" is not displayed on the multi-information display.**
- **When removing the stereo camera cover assembly, cover it with a copy paper or similar dust-free paper to avoid any interference to the camera lens, and tape the paper while being careful not to let the adhesive surface contact the glass surface. Be sure to remove the paper after the procedure.  [Ref. to EyeSight>Stereo Camera>REMOVAL.](#)**

INSPECTION

1. BATTERY

Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery>INSPECTION.](#)  [Ref. to STARTING/CHARGING SYSTEMS\(H4DOTC\)>General Description.](#)

2. WINDSHIELD GLASS AND DASHBOARD

Remove the windshield glass and dashboard in front of the stereo camera.

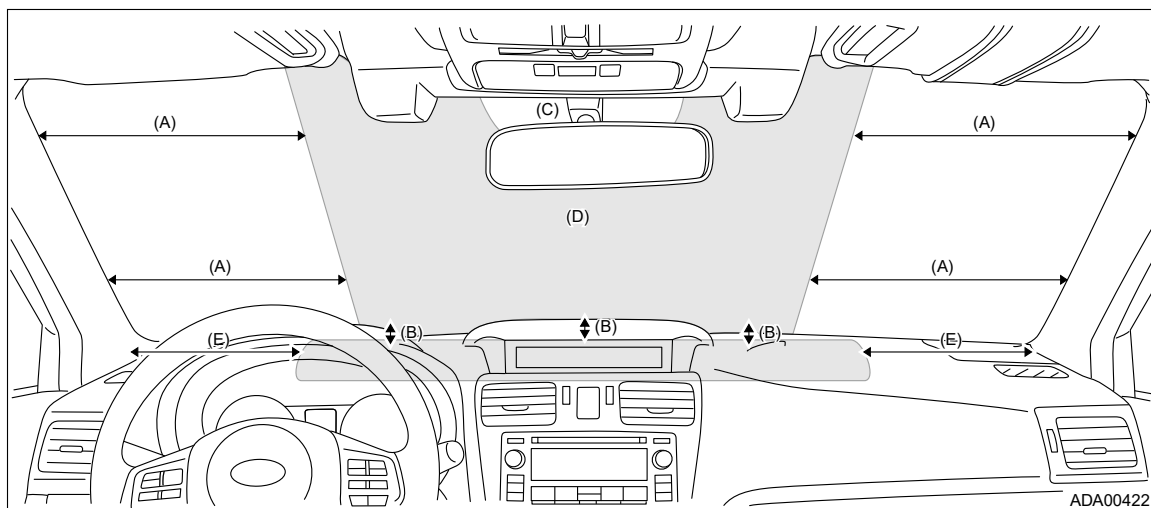
Standard:

There must be no oil film, dirt, scratch or fogging that obstructs the forward visibility of the stereo camera.

Do not stick or attach the aftermarket parts on the prohibited area (D) shown in the figure below.

Even outside the prohibited area, if the abnormal operation occurs due to the reflection of the light or the reflection on the glass, change the adhering position or installation position.

- Application of stickers or antennas, installation of wide-type mirror
 - This will affect the visibility of the stereo camera, causing the function not to operate correctly.
- Placement of navigation unit, ETC or other things on the dashboard
 - These things will be reflected on the windshield glass, affecting the recognition of the stereo camera, thus causing the function not to operate correctly.
- Front view



(A) 350 mm (13.8 in)

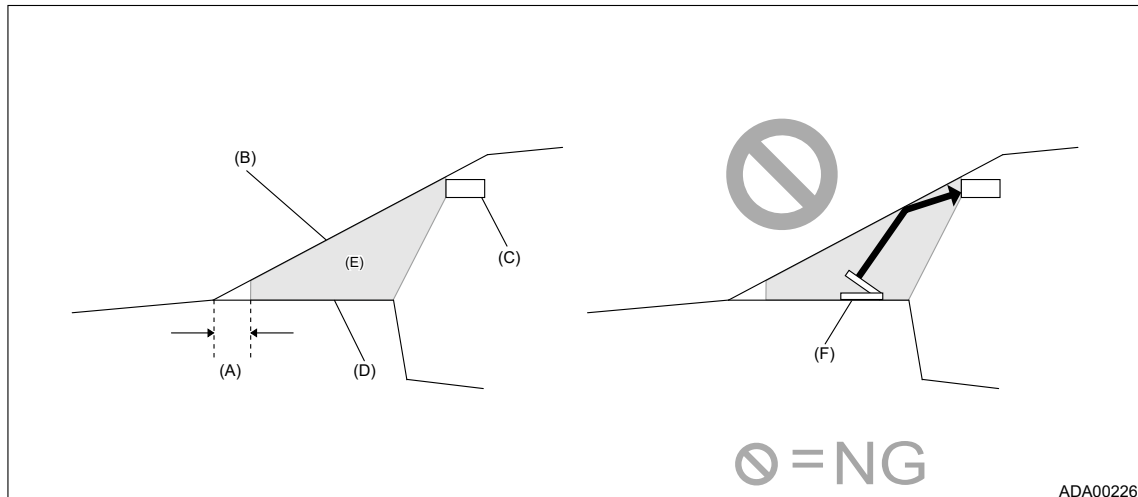
(B) 120 mm (4.7 in)

(C) Ceramic area

(D) Prohibited area

(E) 120 mm (4.7 in)

- Side view



(A) 120 mm (4.7 in)

(C) Stereo camera cover

(E) Prohibited area

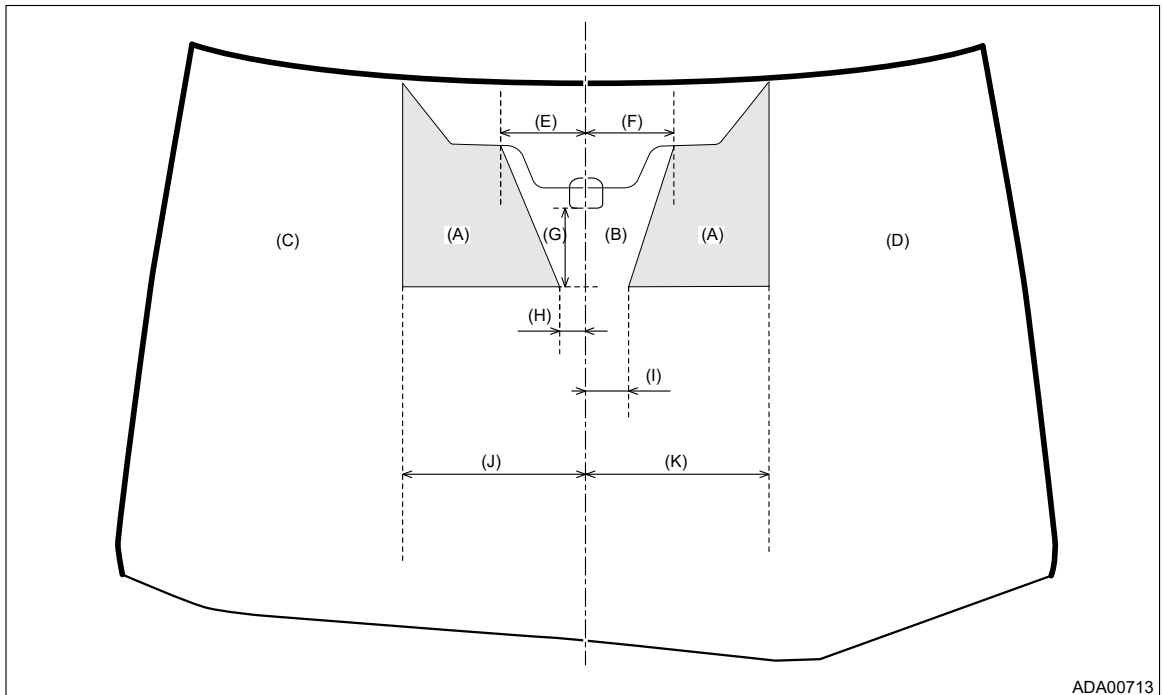
(B) Windshield glass

(D) Dashboard

(F) External monitor etc.

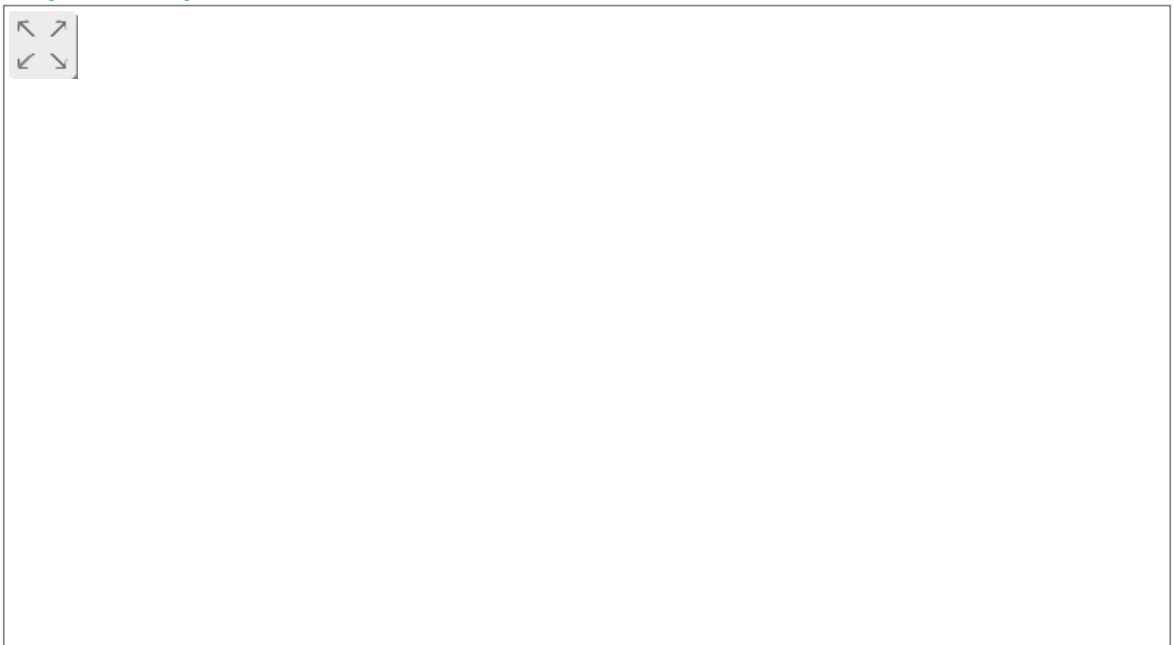
Note:

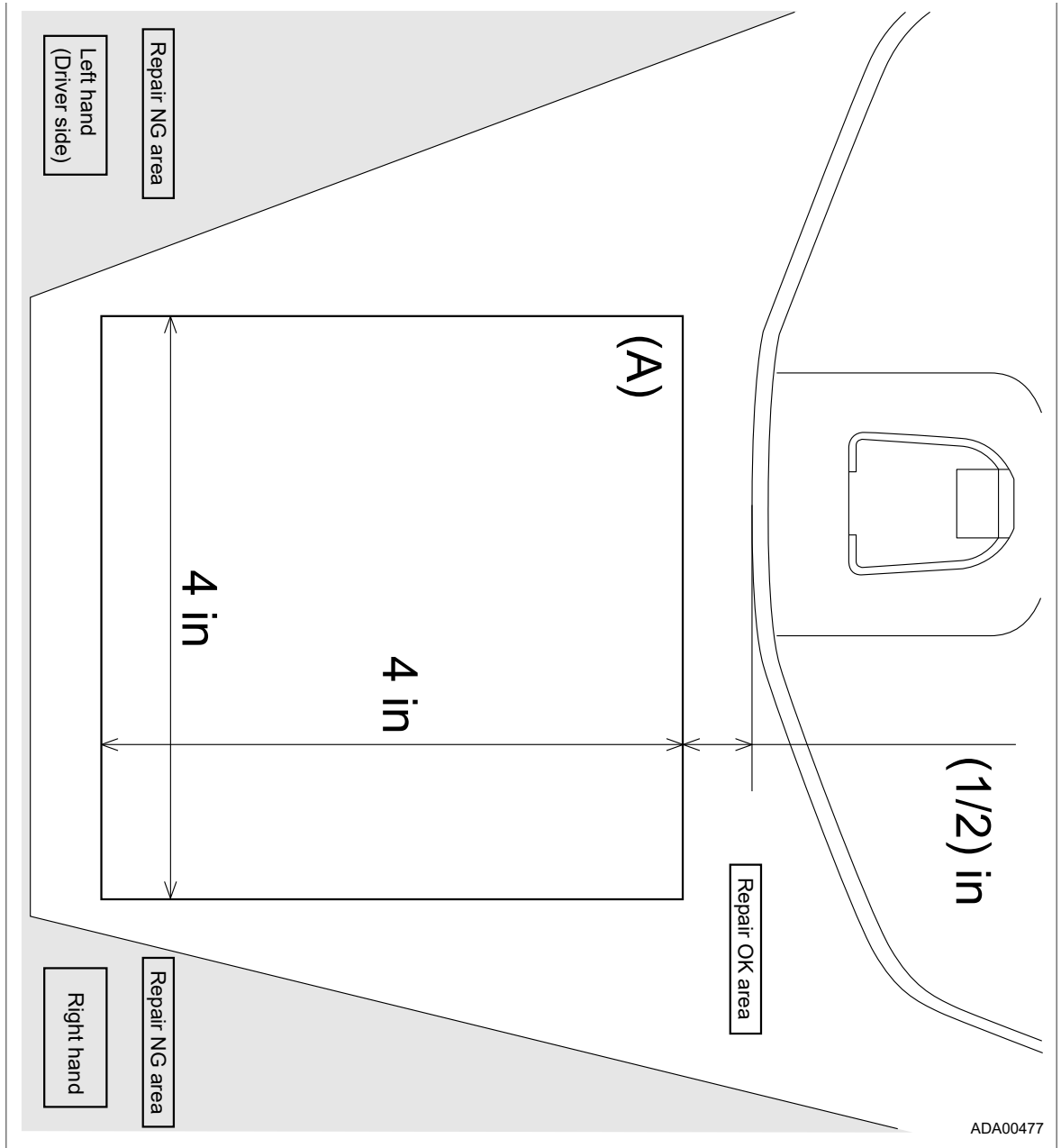
- **Clean the windshield glass if dirt or fogging is found on the glass. Repair or replace the glass if damage is found.**
 - **When cleaning the inner side of the windshield glass, be careful not to touch the lens of the stereo camera. Take care so that the glass cleaner is not applied to the lens. As with the removal procedure of the stereo camera, cover the opening of camera cover with a copy paper or similar dust-free paper before the procedure, in order to avoid any interference to the camera lens, and tape the paper while being careful not to let the adhesive surface contact the glass surface. Be sure to remove the paper after the procedure. 📄 [Ref. to EyeSight>Stereo Camera>REMOVAL.](#)**
 - **When replacing the windshield glass, be sure to replace the part for the EyeSight.**
 - **If the glass is removed or replaced, always perform the stereo camera adjustment and inspection.**
- **If the damage is found in the glass repair prohibited area shown in the figure below, replace the glass.**
 - **Damage in the prohibited area can affect the recognition of the stereo camera even if it is repaired, and thereby EyeSight function may not operate properly.**



- | | | |
|---|---------------------|----------------------|
| (A) Glass repair prohibited area | (E) 131 mm (5.2 in) | (I) 58 mm (2.0 in) |
| (B) Glass repairable area | (F) 125 mm (4.9 in) | (J) 278 mm (10.9 in) |
| (C) Glass repairable area
(Passenger's side) | (G) 89 mm (3.5 in) | (K) 277 mm (10.9 in) |
| (D) Glass repairable area
(Driver's side) | (H) 78 mm (3.1 in) | |

- **Install the ETC transponder inside the area (A) shown in the figure below.**
- Before installing, attach a full-scale copy of the following figure onto the windshield glass surface to install the parts to correct positions.**
 - **Align the position with respect to the end of the ceramic area.**
 - **Prepare a full-scale copy in which the reference dimension on the upper part of the figure actually has 4 inch long.**
 - **Only the transponder with a thickness of 1.5 inches or less can be used.**





ADA00477

- Relocate any aftermarket parts out of the prohibited area.
- Do not touch the lens on the stereo camera. Do not clean the lens of the stereo camera. (If the lens surface is touched, the lens hood must be replaced as it is impossible to clean the lens surface for ensuring quality.)

3. REAR VIEW MIRROR

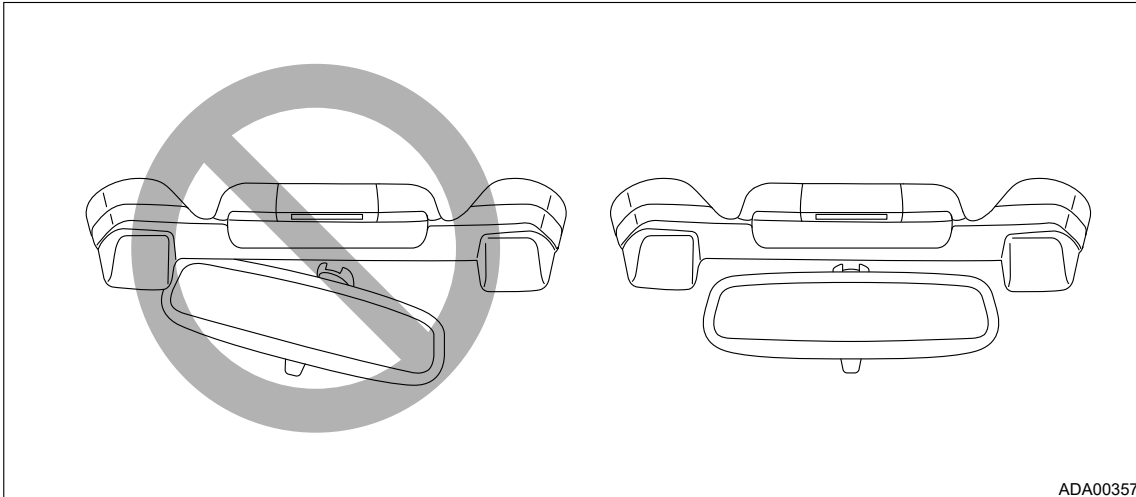
Check the rear view mirror condition.

Standard:

The rear view mirror other than genuine parts shall not be used. (Wide mirrors shall not be used)

The visibility of the stereo camera shall not be blocked.

- This will affect the visibility of the stereo camera, causing the system not to operate correctly.



4. FRONT WIPER

Check the wiping condition of windshield glass.

Standard:

Use Subaru genuine part only for wiper blade body and blade rubber.

— Using the part other than genuine part will affect the recognition of the stereo camera, which may cause the function not to operate correctly.

Do not continue to use damaged blade rubber.

— The windshield glass may be damaged. If the wiping performance decreases or any distinct streak is found, replace it as soon as possible.

Note:

Clean the windshield glass if oil film or dirt is found.

5. TIRE INFLATION PRESSURE

Check the tire air pressure.

Standard:

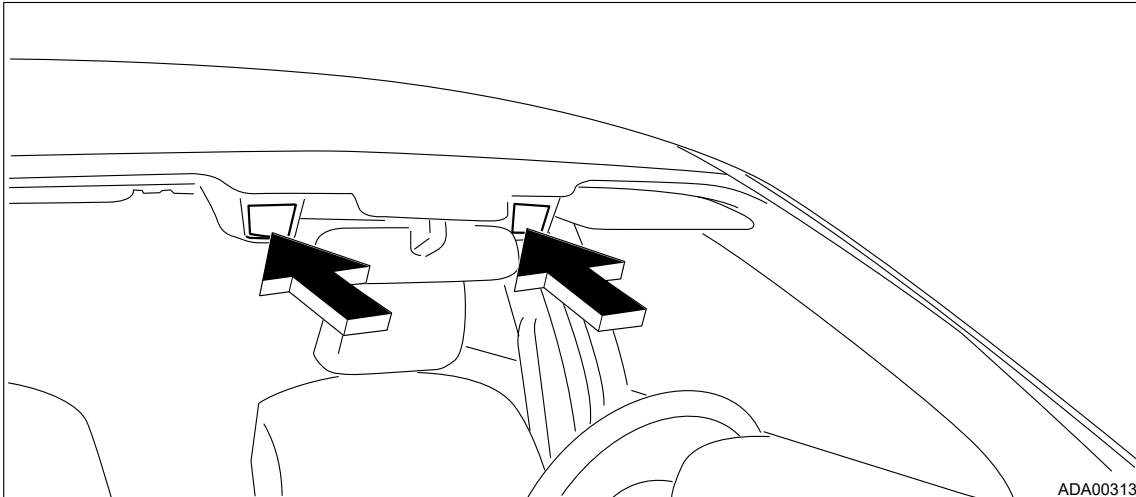
Adjust to the specified air pressure.  [Ref. to WHEEL AND TIRE SYSTEM>General Description>SPECIFICATION.](#)

Do not install worn tire or tires with excessive wear difference.


Install tires with specified size.

6. STEREO CAMERA

Check the lens filter on the left and right camera lenses of the stereo camera for fingerprints or lens filter for cracks or etc. through the windshield glass.




Note:

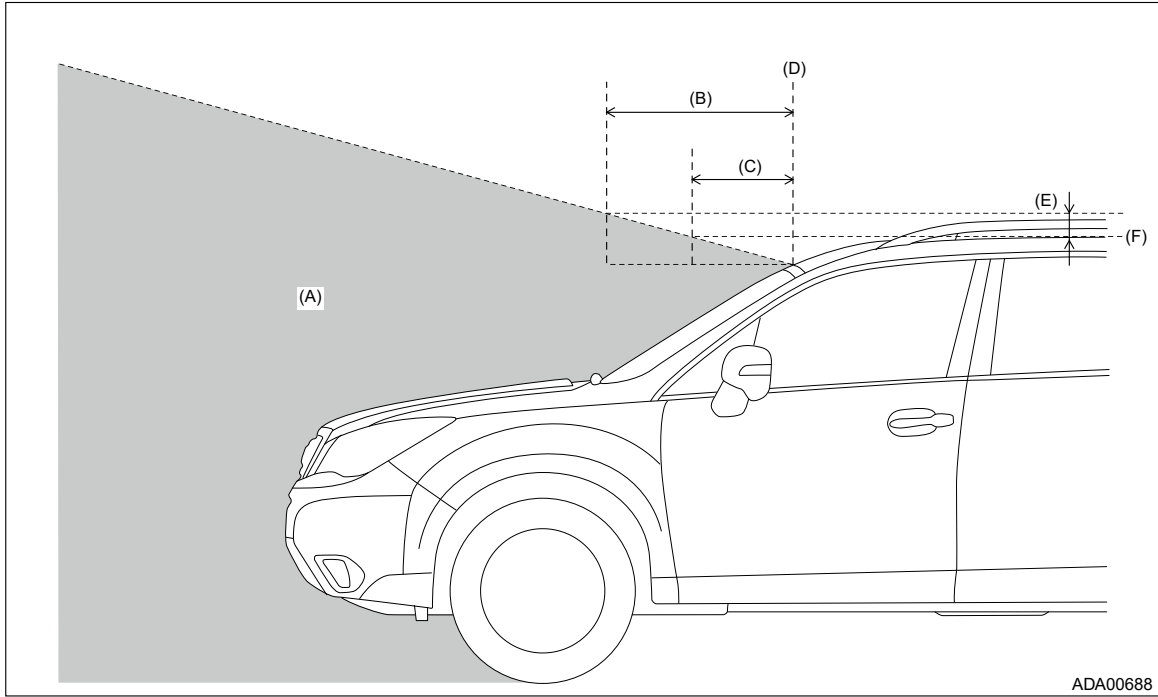
- Do not remove the camera or camera cover to check the lens.
- When spider's web or insects are found in the visibility of the camera or lens hood, remove it using the air blow not to touch the lens surface. Do not cover them with hand or cloth.
- Thin and uniform adhesion of dust, dirt or tobacco stains to the lens filter surface resulting from normal use will not be an obstacle. Do not attempt to clean in such cases.
- If an oil film such as a fingerprint or any excessive dirt adheres, or if the lens filter cracks, replace the stereo camera.  [Ref. to EyeSight>Stereo Camera.](#)
- If the fingerprint adhesions or cracks occur on the lens filter, the following failures may arise.
 - The vehicle may not be able to detect the preceding vehicle or obstacle due to the effects of the headlight of the oncoming vehicle.
 - The vehicle may not be able to detect the preceding vehicle or obstacle due to the effects of the brake light operation of the preceding vehicle.
 - All the functions of the EyeSight may be suspended by the self-diagnosis function equipped with the camera.
 - When the lens filter is broken, the vehicle may not be able to detect the preceding vehicle or obstacle all day and all night.
- Even if the lens filter is not touched, applying the force to the black hood securing the lens filter may tension the lens filter to crack it.
- Do not clean the lens filter with any cleaner. It is quite difficult to uniformly clean both of the right and left lenses, and such an attempt just ends up spreading dirt and will cause problems as same as those from oil film.

7. LOAD ON THE ROOF

Check that load on the roof is not sticking out to the front of the stereo camera.

Standard:

The load on the roof is placed outside the prohibited area (A) shown in the figure below.  [Ref. to WHEEL AND TIRE SYSTEM>General Description>SPECIFICATION.](#)



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(A) Prohibited area
 (B) 880 mm (34.6 in)

(C) 520 mm (20.5 in)
 (D) Windshield glass upper end

(E) 100 mm (3.9 in)
 (F) Highest surface of the roof

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>STSSM4</p>	<p>— (Newly adopted tool)</p>	<p>SUBARU SELECT MONITOR 4</p>	<p>Used for setting of each function and troubleshooting for electrical system.</p> <p>Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".</p>

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Masking tape	Used for removing and installing stereo camera cover assembly.
DST-i	Used together with Subaru Select Monitor 4.

EyeSight (DIAGNOSTICS) > Real-time Diagnosis

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [EyeSight], and then select [Enter].
5. On [Select Function] display, select [Data monitor].
6. Check that the display changes and the contents are correct when performing the operations as follows.
 - Depress and release the brake pedal. (Stop light switch and brake switch are turned ON.)
 - Item [Brake Lamp SW (BIU)][Brake SW Input][Brake Lamp SW (VDC)]
 - Turn the main switch to ON.
 - Item [Cruise Control SW Voltage (Port14)][Cruise Control SW Voltage (Port16)]
 - Turn the SET/– switch to ON.
 - Item [Cruise Control SW Voltage (Port14)][Cruise Control SW Voltage (Port16)]
 - Turn the RES/+ switch to ON.
 - Item [Cruise Control SW Voltage (Port14)][Cruise Control SW Voltage (Port16)]
 - Turn the “Vehicle distance” switch to ON.
 - Item [Cruise Control SW Voltage (Port14)][Cruise Control SW Voltage (Port16)]
 - Turn the “Lane keep” switch to ON.
 - Item [Cruise Control SW Voltage (Port14)][Cruise Control SW Voltage (Port16)]
 - Operate the shift lever.
 - Item [Current gear position]
 - Press and hold the pre-collision brake OFF switch.
 - Item [Pre-Collision Brake OFF Display Signal]
 - Press and hold the lane departure warning OFF switch.
 - Item [Lane Departure Warning Display Signal]

Note:

For detailed operation procedures, refer to “Application help”.

EyeSight (DIAGNOSTICS) > Subaru Select Monitor

INSPECTION

Inspection when communication error with stereo camera is impossible

Detecting condition:

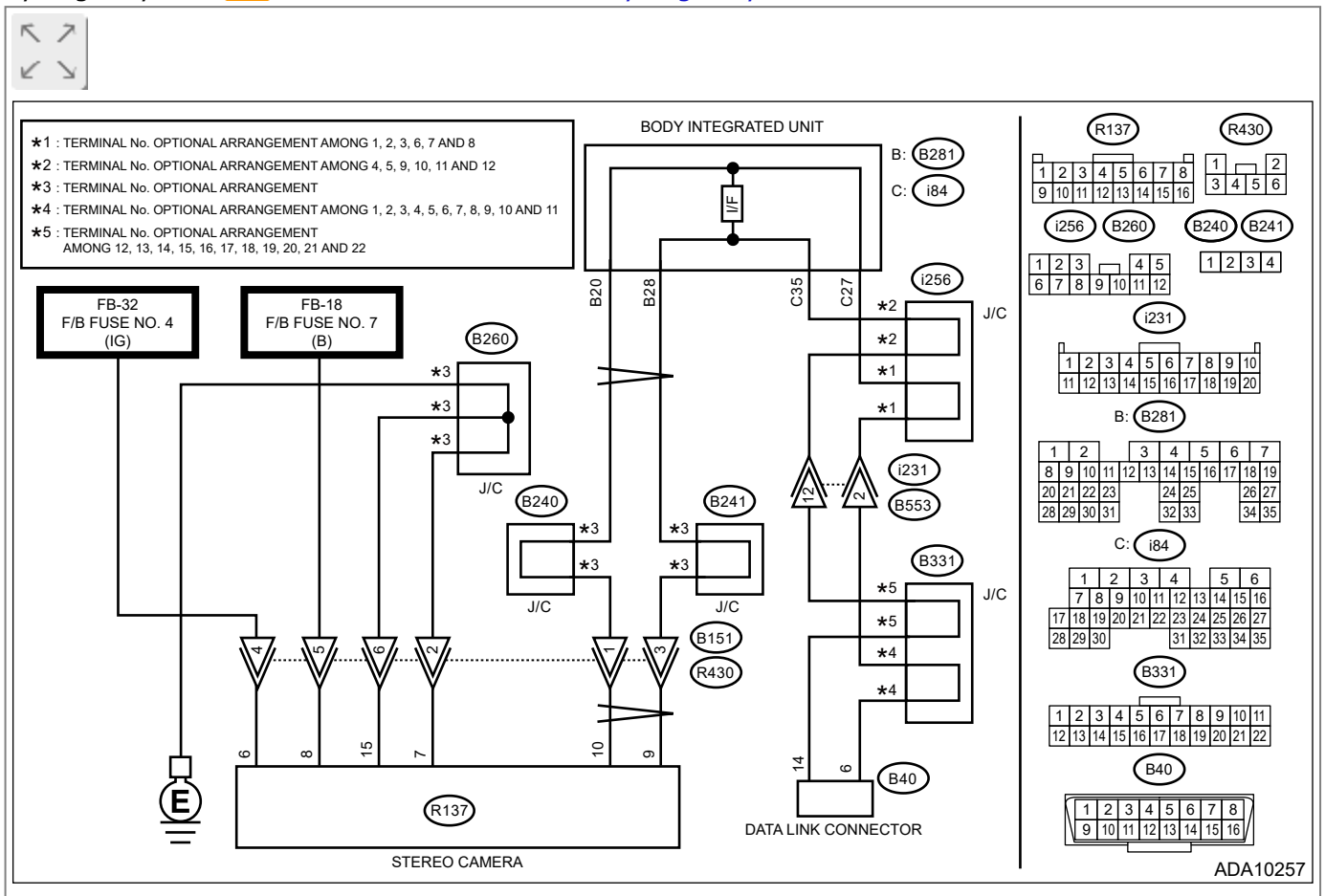
- Defective harness connector
- Power supply circuit malfunction
- Defective stereo camera
- Defective CAN system
- Defective Subaru Select Monitor

Trouble symptom:

- EyeSight warning light blinks.

Wiring diagram:

EyeSight system  Ref. to WIRING SYSTEM>EyeSight System>WIRING DIAGRAM.



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1. CHECK IGNITION SWITCH.

Is the ignition switch ON?

Yes

 [Go to 2.](#)



No

Turn the ignition switch to ON, and select the [EyeSight] using the Subaru Select Monitor.

2. CHECK BATTERY.

1. Turn the ignition switch to OFF.
2. Measure the battery voltage.

Is the voltage 10 V or more?

Yes

 [Go to 3.](#)

No

Charge or replace the battery.

3. CHECK BATTERY TERMINAL.

Check the battery terminal.

Is the battery terminal contact proper?

Yes

 [Go to 4.](#)

No

Connect the battery terminal securely or replace it.

4. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check whether the communication can be executed normally.

Is the communication between Subaru Select Monitor and body integrated unit normal?

Yes

 [Go to 5.](#)

No


Check the connection of the Subaru Select Monitor, and perform communication with the body integrated unit again.

5. CHECK LAN SYSTEM.

Inspect LAN system.

Is the check result OK?

Yes

 [Go to 6.](#)

No

Perform the inspection according to the diagnosis for LAN system.

6. CHECK HARNESS CONNECTOR BETWEEN STEREO CAMERA AND DATA LINK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the stereo camera connector.
3. Measure the resistance between the stereo camera and the data link connector.

Connector & terminal

(R137) No. 10 — (B40) No. 6:

(R137) No. 9 — (B40) No. 14:

Is the resistance less than 10 Ω ?

Yes

 [Go to 7.](#)

No

Repair or replace the harness and connectors between the stereo camera and data link connector.

7. CHECK POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to ON.
2. Measure the voltage between stereo camera and chassis ground.

Connector & terminal

(R137) No. 6 (+) — Chassis ground (-):


(R137) No. 8 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 8.](#)

No

Check the power supply circuit. Or, check Auto Start Stop system.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Basic Diagnostic Procedure>PROCEDURE.](#)

8. CHECK GROUND CIRCUIT.




1. Turn the ignition switch to OFF, then disconnect the ground cable from battery.
2. Measure the resistance between harness connector of stereo camera and chassis ground.

Connector & terminal

(R137) No. 7 — Chassis ground:

Is the resistance less than 10 Ω ?

Yes

 [Go to 9.](#)

No

Check the harness from stereo camera to chassis ground.

9. CHECK CONNECTOR.



Is there poor contact of stereo camera connector?

Yes

Repair the connector, or replace harness.

No

Replace the stereo camera.  [Ref. to EyeSight>Stereo Camera>REMOVAL.](#)

OPERATION

1. GENERAL DESCRIPTION

For on-board diagnosis function of the EyeSight, use the Subaru Select Monitor.

The on-board diagnosis function operates in three categories, which are used depending on the type of problems.

1. Diagnosis with diagnostic trouble code (DTC):

When the electrical failure occurs in the EyeSight, DTC is detected from the stereo camera. If the DTC is detected, the relevant DTC is displayed by illuminating or blinking the EyeSight warning light. To check the details concerning the DTC, use the Subaru Select Monitor.

2. Diagnosis with cancel code and lane keep assist code:

(1) This category of diagnosis requires actual driving of the vehicle in order to determine the cause in such a case when the set speed is cancelled during cruise control driving or the control is cancelled during active lane keep driving although any cancel condition is not entered.

(2) With ECM cancel code and stereo camera ACC cancel code, cancel condition (Code No.) is stored when detected during cruise control driving. With lane keep assist code of stereo camera, cancel condition (Code No.) is stored if active lane keeping does not operate or if control cancel occurs during active lane keep driving.

Caution:

- **With ECM cancel code, not only the cruise control "cancel" occurred (although the driver does not input the "cancel" operation), but also the "cancel" condition input by the driver is stored.**
- **The latest memory contents of the ECM cancel code (latest code) is cleared when the ignition switch is turned to OFF. However, memory contents set by the diagnosis of faulty switches related to the system and cruise control will remain as trouble history (memory code) after the ignition switch is turned to OFF.**

3. Real-time Diagnosis:

Real-time diagnosis function is used to determine whether or not the input signal system is in good order, according to signal emitted from switches, sensors, etc.

(1) Vehicle cannot be driven at cruise speed when the problem occurs in the cruise control system or relevant circuits.

(2) Monitor the signal conditions from switches and sensors.

2. BASIC OPERATION

For detailed operation procedures, refer to "Application help".

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Active Test

LIST

Item	Display	Note
Right Steering Responsive Headlight	—	SRH swivel actuator on the right side operates. Note: Used for unit inspection etc. of the SRH swivel actuator.
Left Steering Responsive Headlight	—	SRH swivel actuator on the left side operates. Note: Used for unit inspection etc. of the SRH swivel actuator.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Active Test

OPERATION


- 1.** On [Start] display, select [Diagnosis].
- 2.** On [Vehicle selection] display, input the target vehicle information and select [OK].
- 3.** On [Main Menu] display, select [Each System].
- 4.** On [Select System] display, select [Headlight / Foglight], and then select [Enter].
- 5.** On [Select Function] display, select [Active Test].

Note:

For detailed operation procedures, refer to “Application help”.

PROCEDURE

1. PERFORM CUSTOMER INTERVIEW.


Using the Check List for Interview, ask the customer the condition of how the trouble occurred.  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Check List for Interview.](#)

Did you interview the customer?


Yes

 [Go to 2.](#)

No


Interview the customer.  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Check List for Interview.](#)

2. CHECK LAN SYSTEM.

Inspect LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

Is the check result OK?


Yes

 [Go to 3.](#)


No

Perform the inspection according to the diagnosis for LAN system.

3. CHECK AUTO HEADLIGHT BEAM LEVELER SYSTEM.


Using the Subaru Select Monitor, read DTC of the auto headlight beam leveler system inspection.  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Note:

If the communication function of the Subaru Select Monitor cannot be executed properly, check the communication circuit.  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Subaru Select Monitor>INSPECTION.](#)


Are any DTCs displayed?

Yes


Record the DTCs and time stamps, and perform the diagnosis for the displayed DTCs.  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>List of](#)

[Diagnostic Trouble Code \(DTC\).](#)


Note:

For time stamp, refer to "LAN SYSTEM".  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>General Description>CAUTION > TIME STAMP.](#)

No

 [Go to 4.](#)

4. CHECK DIAGNOSTICS WITH PHENOMENON.

Check "Diagnostics with Phenomenon".  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Diagnostics with Phenomenon.](#)

Does the symptom apply?




Yes

Perform diagnosis according to the procedures in the diagnostics with phenomenon.

No

 [Go to 5.](#)

5. CHECK TROUBLE PHENOMENON.

1. Perform the basic inspection and function check.  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>General Description>INSPECTION.](#)
2. Check the auto headlight beam leveler CM.  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Control Module I/O Signal.](#)
3. Check data monitor.  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Data Monitor.](#)
4. Perform a unit check.

Was the trouble cause found?

Yes

Repair or replace the cause of trouble.

No

System is normal.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Check List for Interview

CHECK

1. AUTO HEADLIGHT BEAM LEVELER SYSTEM

Inspect the following items regarding the vehicle's state.



Auto Headlight Beam Leveler System Check List for Interview			Date the Vehicle is Received
Year	Month	Day	
Customer's name	Registration No.	Initial year of registration Year Month Date	
	Vehicle model	Frame number	
Interviewer	Inspector	Engine type	Odometer reading
Customer specified content • • •			
Date and time when the trouble occurred		Frequency of trouble occurrence	Always occurs Sometimes occurs (times per day, times per month)
Condition of trouble occurrence (How the trouble occurs)	Weather	Fine • Cloudy • Rainy • Snowy • Others ()	
	Temperature	°C (°F) — °C (°F)	
Road conditions		Occurrence location	
Accessory installation condition			
Confirmation of trouble condition			
<input type="checkbox"/> Diagnostic Trouble Code			

2. STEERING RESPONSIVE HEADLIGHT

Inspect the following items regarding the vehicle's state.



Steering • Responsive • Headlight Check List for Interview			Date the Vehicle is Received
Year	Month	Day	

Customer's name		Registration No.	Initial year of registration Year Month Date
		Vehicle model	Frame number
Interviewer	Inspector	Engine type	Odometer reading
Customer specified content • • •			
Date and time when the trouble occurred		Frequency of trouble occurrence	Always occurs Sometimes occurs (times per day, times per month)
Condition of trouble occurrence (How the trouble occurs)		Weather	Fine • Cloudy • Rainy • Snowy • Others ()
		Temperature	°C (°F) — °C (°F)
Road conditions			
Accessory installation condition			
Confirmation of trouble condition			
Curve of trouble occurrence	<input type="checkbox"/> Right-hand curve <input type="checkbox"/> Left-hand curve <input type="checkbox"/> Both		
Information on curve of trouble occurrence Note: Check the location and curve on the map.	<input type="checkbox"/> Specific location <input type="checkbox"/> Gentle curve <input type="checkbox"/> Sharp curve <input type="checkbox"/> Uphill <input type="checkbox"/> Downhill <input type="checkbox"/> Other		
Vehicle speed at trouble occurrence	Approximately km/h (MPH)		
SRH OFF indicator status	<input type="checkbox"/> Light OFF <input type="checkbox"/> Light ON <input type="checkbox"/> Blink		
Headlight switch operation	<input type="checkbox"/> Lo-Hi switch available <input type="checkbox"/> Lo-Hi switch unavailable		
Range inspection for CVT vehicle	<input type="checkbox"/> Shift indicator operates according to the shift position <input type="checkbox"/> Shift indicator does not operate according to the shift position		
<input type="checkbox"/> Diagnostic Trouble Code			

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Clear memory

OPERATION

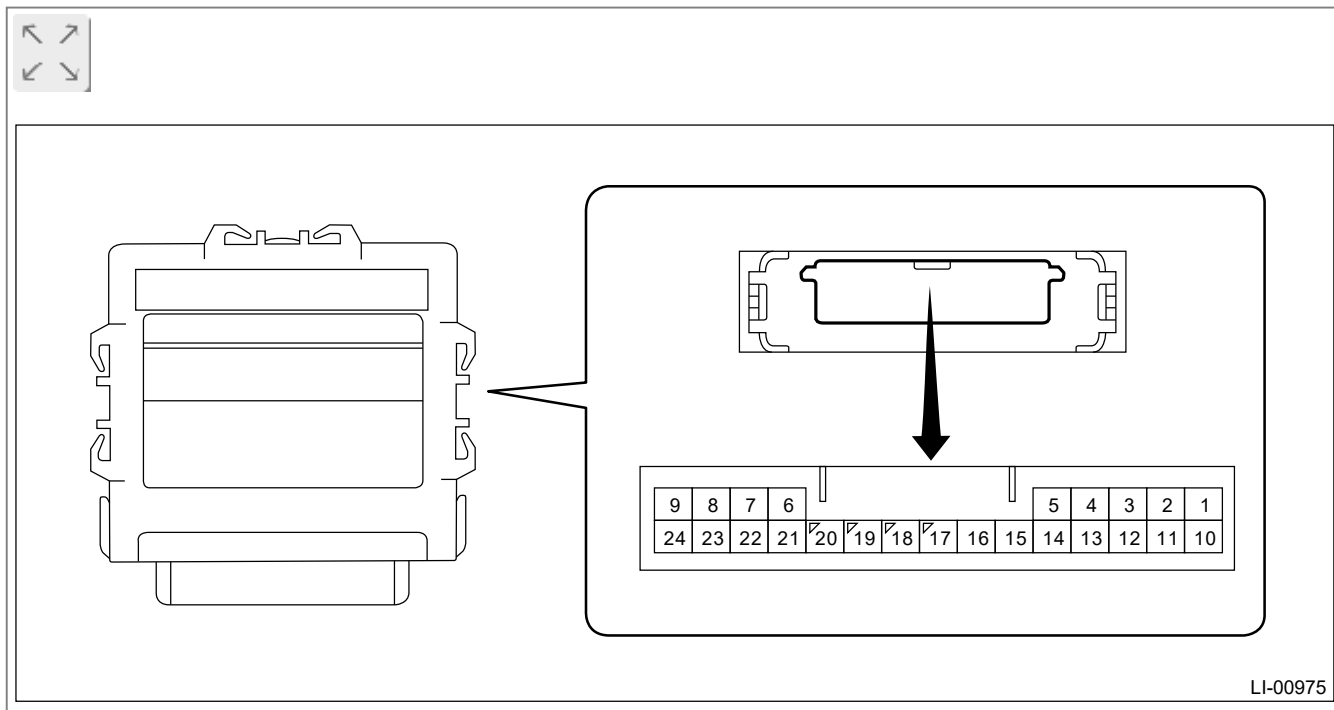
- 1.** On [Start] display, select [Diagnosis].
- 2.** On [Vehicle selection] display, input the target vehicle information and select [OK].
- 3.** On [Main Menu] display, select [Each System].
- 4.** On [Select System] display, select [Headlight / Foglight], and then select [Enter].
- 5.** On [Select Function] display, select [DTC].
- 6.** On [DTC] display, select [Clear memory].

Note:

For detailed operation procedures, refer to “Application help”.

ELECTRICAL SPECIFICATION

1. AUTO HEADLIGHT BEAM LEVELER CM



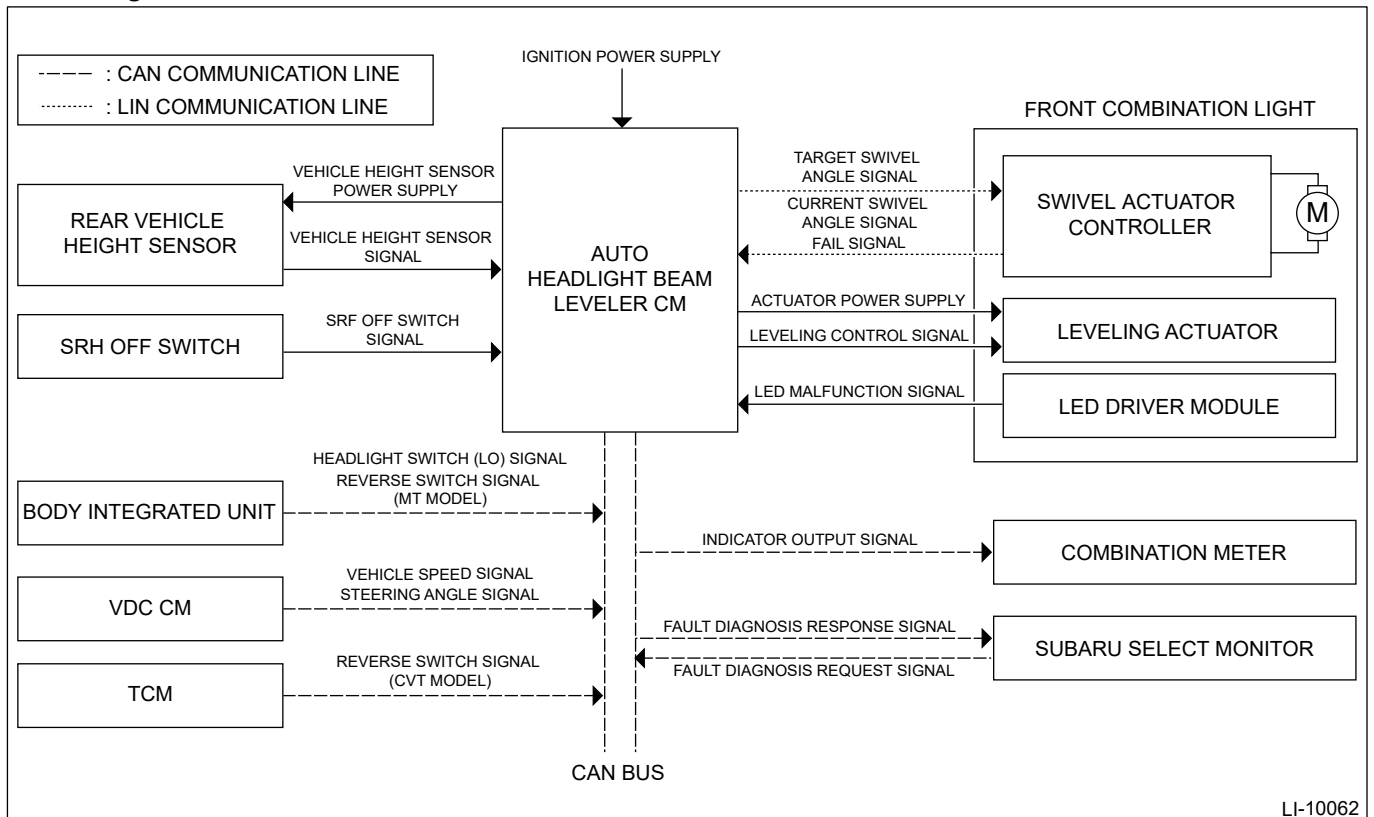
Terminal No.	Content	Measuring condition	Standard
1 ↔ Chassis ground	IG power supply	Ignition switch ON	8 – 16 V
2 ↔ Chassis ground	GND	Always	Less than 1 Ω
3 ↔ Chassis ground	Rr vehicle height sensor GND	Always	Less than 1 Ω
4	Not used	—	—
5 ↔ Chassis ground	RH headlight malfunction signal	Always	1 MΩ or more
6	Not used	—	—
7 ↔ Chassis ground	SRH signal (LIN)	Always	1 MΩ or more
8	Not used	—	—
9 ↔ Chassis	SRH GND	Always	Less than 1 Ω

ground			
10 ↔ Chassis ground	Leveling actuator power supply	Ignition switch ON	10 – 16 V
11 ↔ Chassis ground	Leveling actuator GND	Always	Less than 1 Ω
12 ↔ 3	Rr vehicle height sensor power supply	Ignition switch ON	4.75 – 5.25 V
13	Not used	—	—
14	Not used	—	—
15	Not used	—	—
16 ↔ Chassis ground	LH headlight malfunction signal	Always	1 MΩ or more
17 ↔ Chassis ground	Leveling actuator signal	Headlight off → on	Less than 1 V → 1.0 – 14.4 V (for 17 seconds)
		Headlight on, no vehicle height change → change and hold vehicle height for 3 seconds or more	
18	Not used	—	—
19 ↔ Chassis ground	Rr sensor signal	IG ON (with no passenger, no load and vehicle stopped)	Approx. 2.5 V (changes according to vehicle condition)
20	Not used	—	—
21	Not used	—	—
22 ↔ Chassis ground	SRH OFF switch	Switch OFF → ON (at SRH OFF)	1 MΩ or more → less than 1 Ω
23	CAN-H	Always	1 MΩ or more
24	CAN-L	Always	1 MΩ or more

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Control Module I/O Signal


SYSTEM BLOCK DIAGRAM

- The auto headlight beam leveler is a system that automatically adjusts the headlight beam level (vertical directions) according to the longitudinal inclination angle of the vehicle due to heavy load or passengers' getting in/off a car.
- The steering responsive headlight is a system that calculates the corner R from the steering angle and vehicle speed to illuminate beyond the corner by moving the headlight beam to left and right.



HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Data Monitor

LIST

Item Name	Content	Standard	Note
Trip Count	Time stamp information, trip counter	—	 Ref. to LAN SYSTEM (DIAGNOSTICS)>General Description>CAUTION > TIME STAMP.
Count	Time stamp information, original counter identification information	—	
Time Count	Time stamp information, time counter	—	
F Sensor Signal	Output voltage value from front vehicle height sensor	5 V	Fixed at 5 V because front vehicle height sensor is not equipped.
R Sensor Signal	Output voltage value from rear vehicle height sensor	Approx. 2.5 V	Changes according to vehicle condition.
Actuator Signal	Power supply voltage value to headlight beam leveler actuator	Not in operation: 0% In operation: 10 — 90% (17 Sec)	Changes according to vehicle condition.
Control module voltage	IG voltage condition of auto headlight beam leveler CM	8 — 16 V	—
Indicator Signal	Meter indicator condition	Light off: Normal Light up: Abnormal Blinks 3times at 2Hz.: When blinking 3 times at 2 Hz Blinks 2times at 2Hz.: When blinking 2 times at 2 Hz Check Bulb: When checking the valve	—
Vehicle speed signal	Status of vehicle speed	Shows vehicle speed	—
H/L Lo Signal	Headlight (Lo) lighting condition	Light OFF: Headlight (Lo) OFF	—

		Light ON: Headlight (Lo) ON	
LED HEADLAMP(LH) error Signal	Open circuit detection signal status	Light OFF: Open circuit undetected Light ON: Open circuit detected	—
LED HEADLAMP(RH) error Signal	Open circuit detection signal status	Light OFF: Open circuit undetected Light ON: Open circuit detected	—
Headlight High Beam Signal	Headlight (Hi) lighting condition	Light OFF: Headlight (Hi) OFF Light ON: Headlight (Hi) ON	—
Steering Angle Signal	Steering angle status	—	Steering angle is displayed.
Shift Position Signal	Shift lever position	—	Shift lever position is displayed.
MT Reverse SW	Reverse switch signal status (MT)	ON: When shift lever is set in reverse position OFF: When shift lever is set in other than reverse position	—
SRH-OFF SW	SRH OFF switch signal	ON: When SRH OFF switch is ON OFF: When SRH OFF switch is OFF	—
Engine Speed	Engine speed signal	—	Engine speed is displayed.
Vehicle Height	Vehicle height signal	Unclear: When other than following XV/OBK: When XV/OBK SDN/WGN: When other than SDN/WGN	—
Left Steering Responsive Headlight Current Angle	SRH swivel actuator current angle (LH) signal	—	Swivel angle is displayed.
Right Steering Responsive Headlight Current Angle	SRH swivel actuator current angle (RH) signal	—	Swivel angle is displayed.
Left Steering Responsive Headlight Target Angle	SRH swivel actuator target angle (LH)	—	Swivel angle is displayed.

	signal		
Right Steering Responsive Headlight Target Angle	SRH swivel actuator target angle (RH) signal	—	Swivel angle is displayed.
Left Steering Responsive Headlight Power Supply Failure	SRH swivel actuator power supply failure (LH) signal	Normal: At normal condition Abnormal: At abnormal condition	—
Right Steering Responsive Headlight Power Supply Failure	SRH swivel actuator power supply failure (RH) signal	Normal: At normal condition Abnormal: At abnormal condition	—
Left Steering Responsive Headlight Motor Failure	SRH swivel actuator motor failure (LH) signal	Normal: At normal condition Abnormal: At abnormal condition	—
Right Steering Responsive Headlight Motor Failure	SRH swivel actuator motor failure (RH) signal	Normal: At normal condition Abnormal: At abnormal condition	—
Left Steering Responsive Headlight Sensor Failure	SRH swivel actuator sensor error (LH) signal	Normal: At normal condition Abnormal: At abnormal condition	—
Right Steering Responsive Headlight Sensor Failure	SRH swivel actuator sensor error (RH) signal	Normal: At normal condition Abnormal: At abnormal condition	—

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Data Monitor

OPERATION

- 1.** On [Start] display, select [Diagnosis].
- 2.** On [Vehicle selection] display, input the target vehicle information and select [OK].
- 3.** On [Main Menu] display, select [Each System].
- 4.** On [Select System] display, select [Headlight / Foglight], and then select [Enter].
- 5.** On [Select Function] display, select [Data monitor].

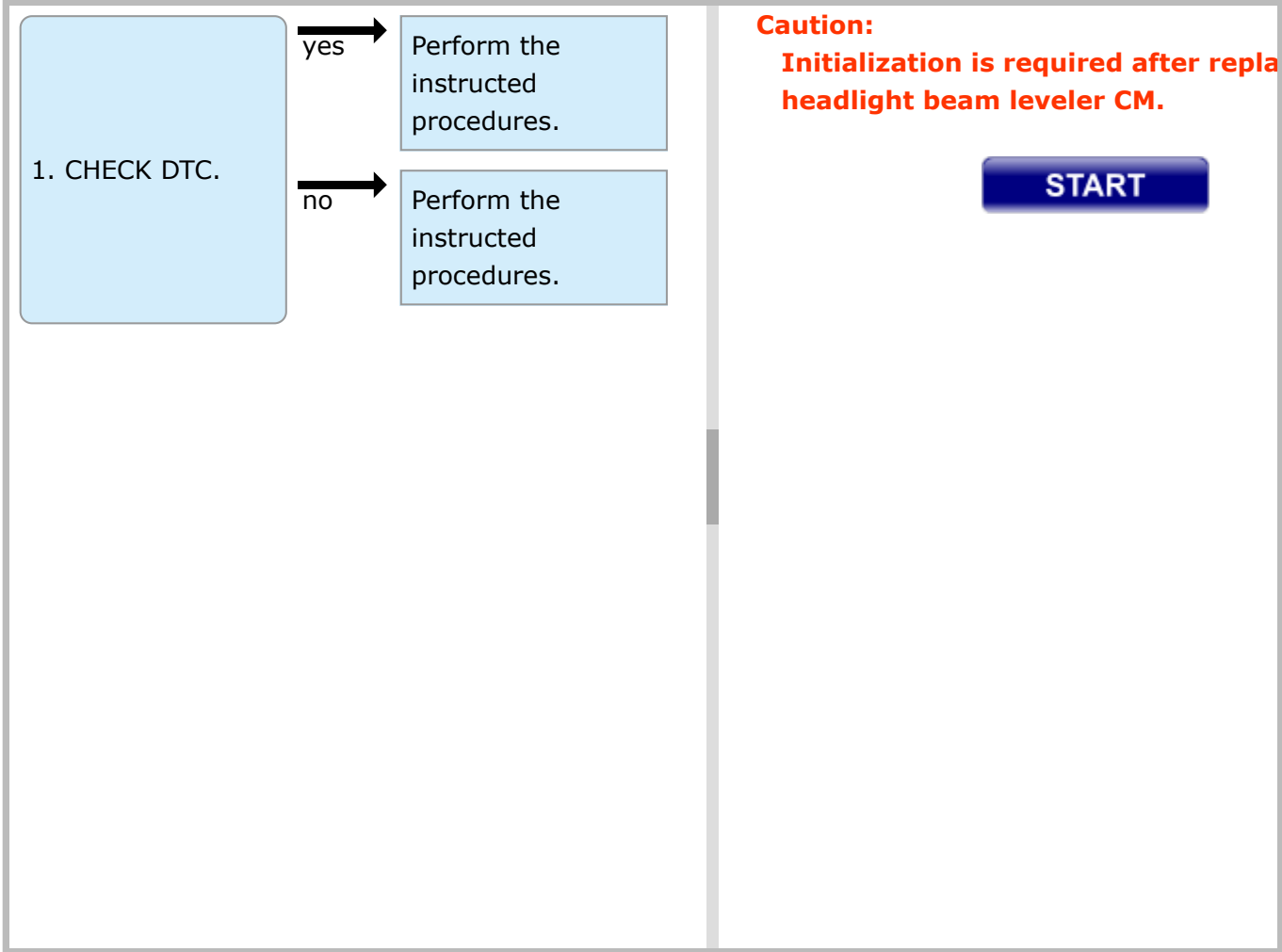
Note:

For detailed operation procedures, refer to “Application help”.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2900 AHL CONTROL

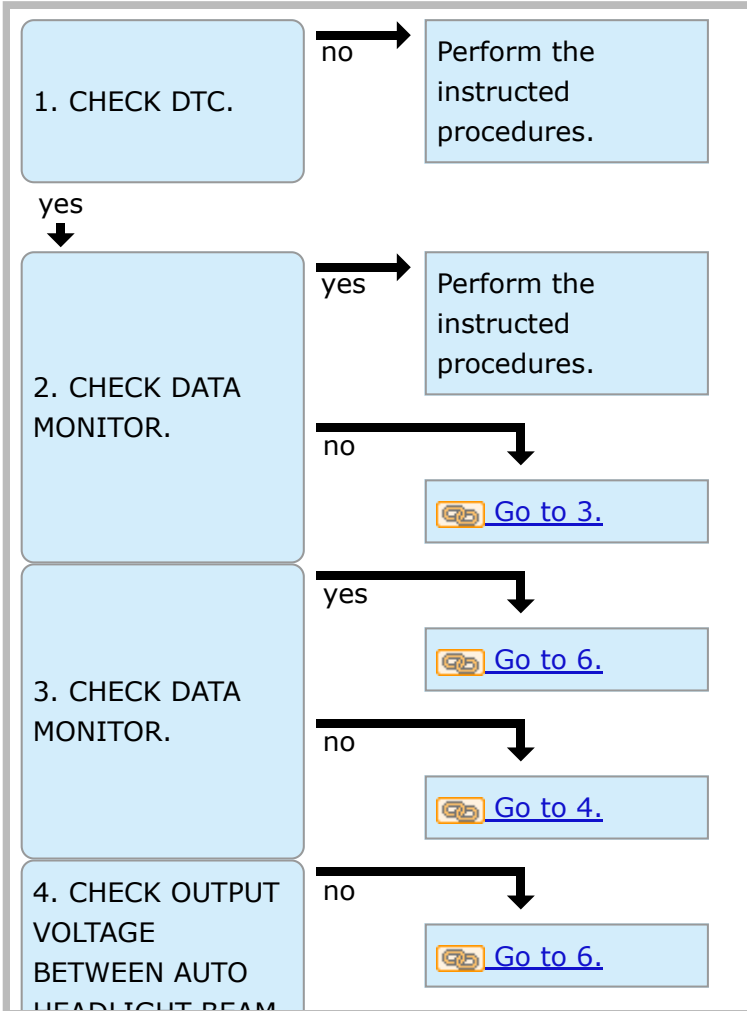
[CAUTION/NOTE](#) [INTRO](#)



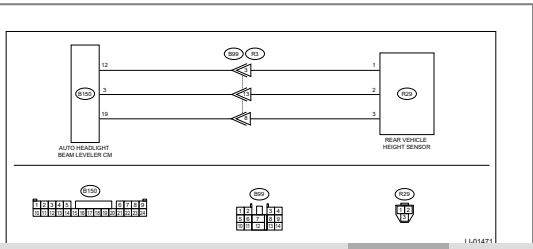
HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2902 REAR HEIGHT SENSOR CIRCUIT

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Headlight beam leveler system [Ref. to V SYSTEM>Headlight Beam Leveler System>V DIAGRAM.](#)



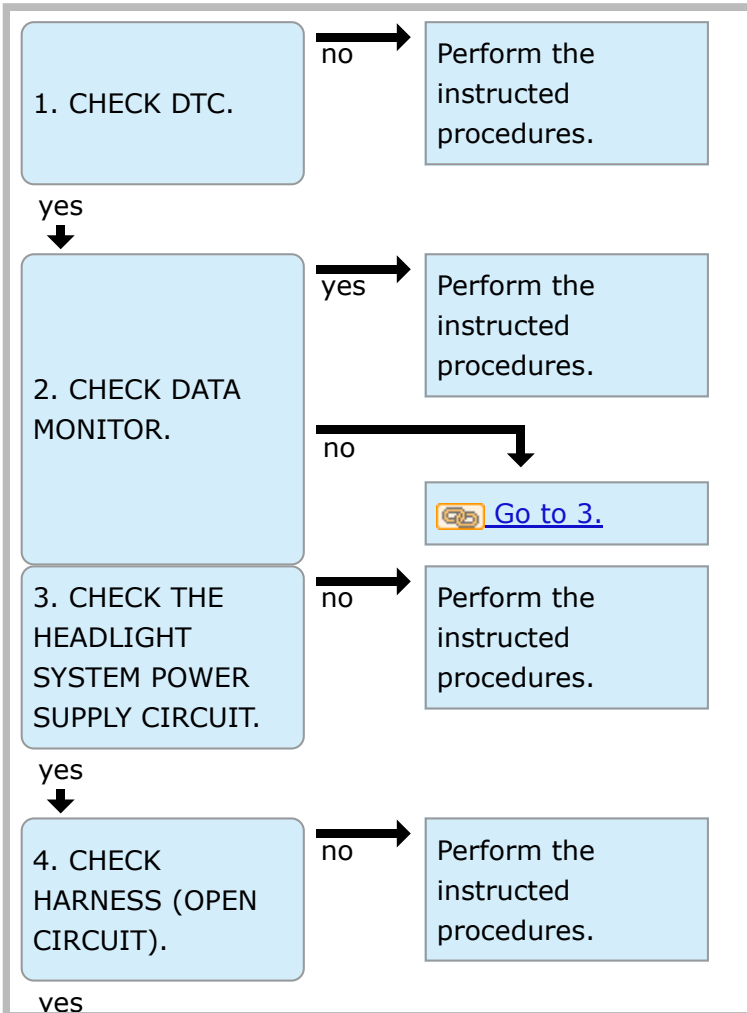
Caution:
 Initialization is required after repla headlight beam leveler CM and the height sensor.

START

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

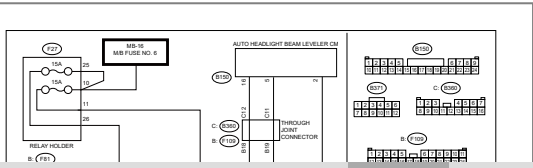
DTC B2904 LED HEADLAMP(RH) ERROR

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

- Headlight beam leveler system [Ref. to SYSTEM>Headlight Beam Leveler System DIAGRAM.](#)
- Headlight system [Ref. to WIRING SYSTEM>Headlight System>WIRING DIA/](#)



Caution:

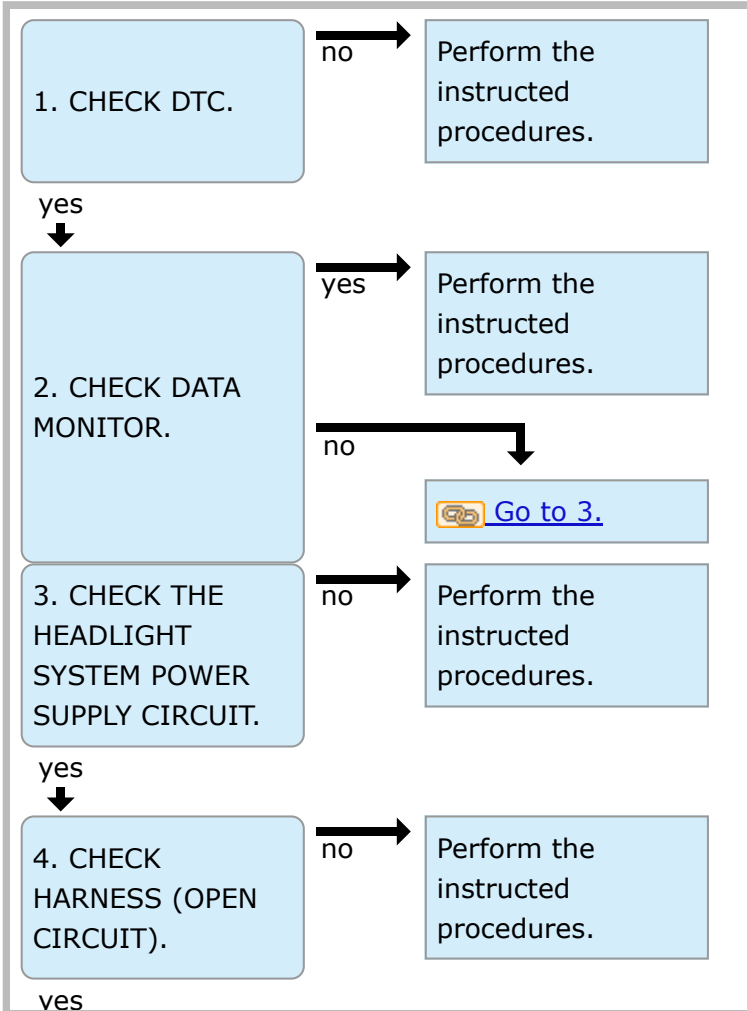
- Initialization is required after re auto headlight beam leveler CM.
- After replacing the headlight as headlight beam adjustment is re

START

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

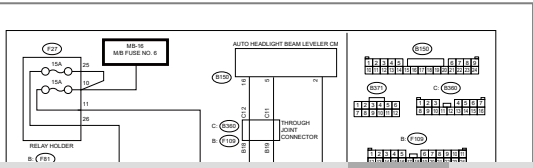
DTC B2905 LED HEADLAMP(LH) ERROR

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

- Headlight beam leveler system [Ref. to SYSTEM>Headlight Beam Leveler System DIAGRAM.](#)
- Headlight system [Ref. to WIRING SYSTEM>Headlight System>WIRING DIA/](#)



Caution:

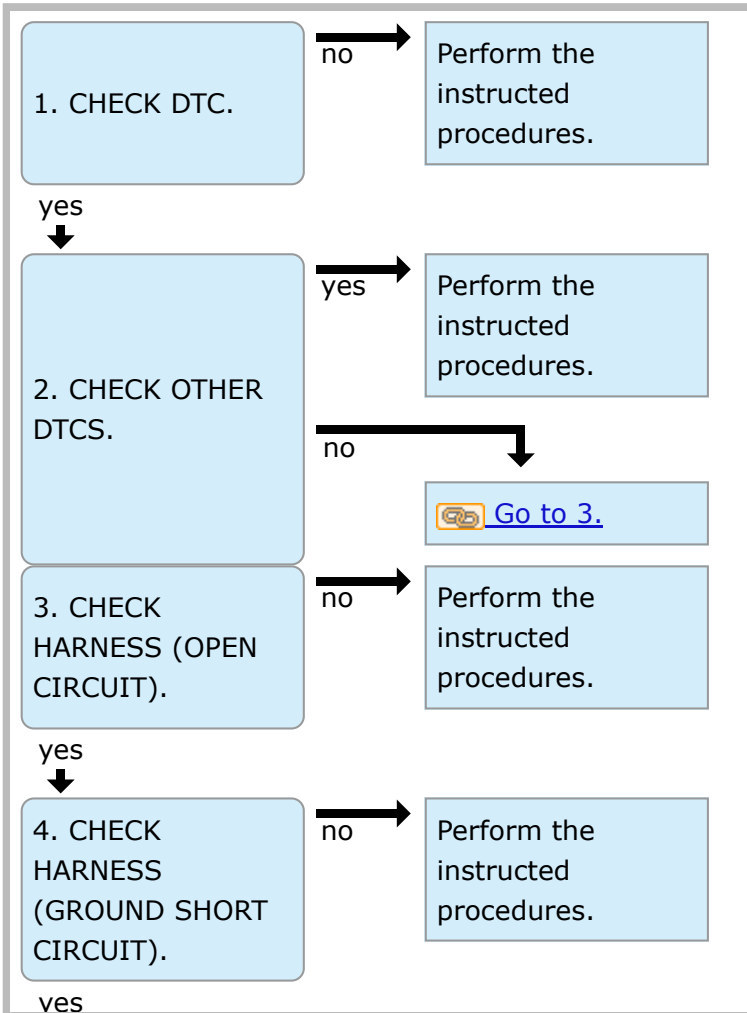
- Initialization is required after re auto headlight beam leveler CM.
- After replacing the headlight as headlight beam adjustment is re

START

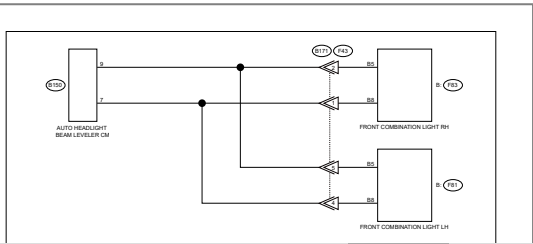
HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2908 STEERING RESPONSIVE HEADLIGHT ACTUATOR RH

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Headlight beam leveler system [Ref. to V SYSTEM>Headlight Beam Leveler System>V DIAGRAM.](#)



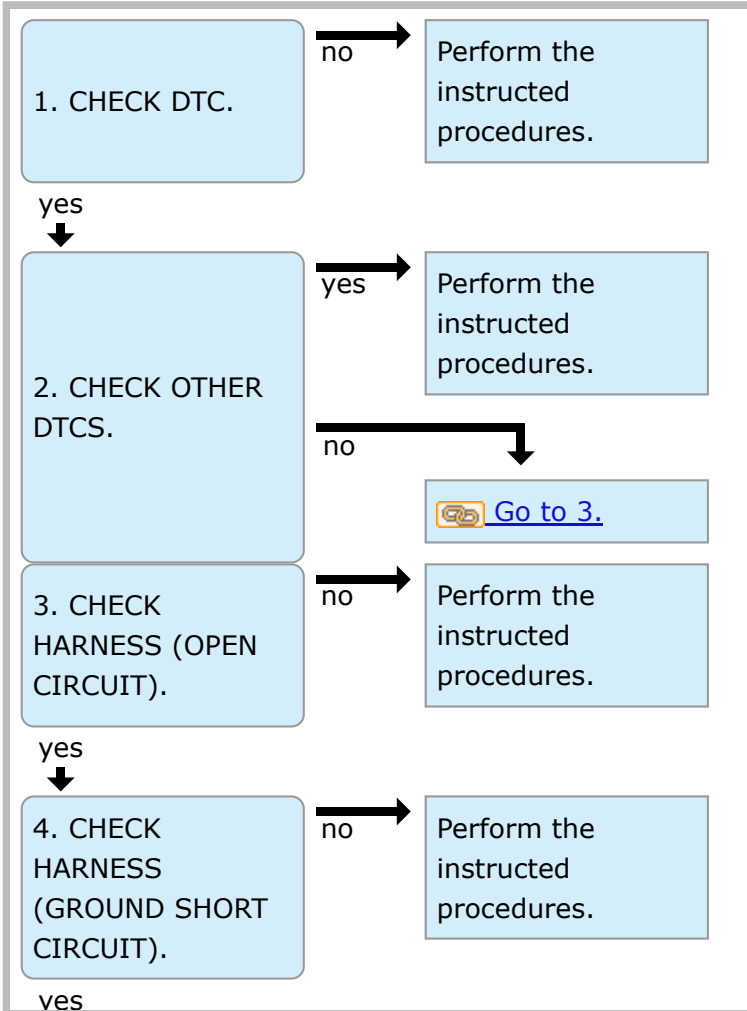
- Caution:**
- Initialization is required after re auto headlight beam leveler CM.
 - After replacing the headlight as headlight beam adjustment is re

START

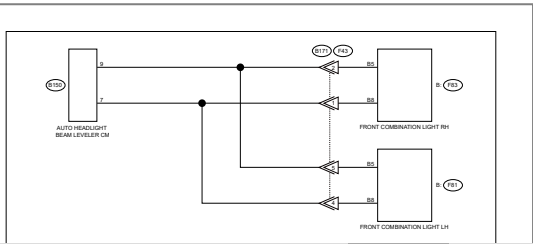
HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2909 STEERING RESPONSIVE HEADLIGHT ACTUATOR LH

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Headlight beam leveler system [Ref. to V SYSTEM>Headlight Beam Leveler System>V DIAGRAM.](#)



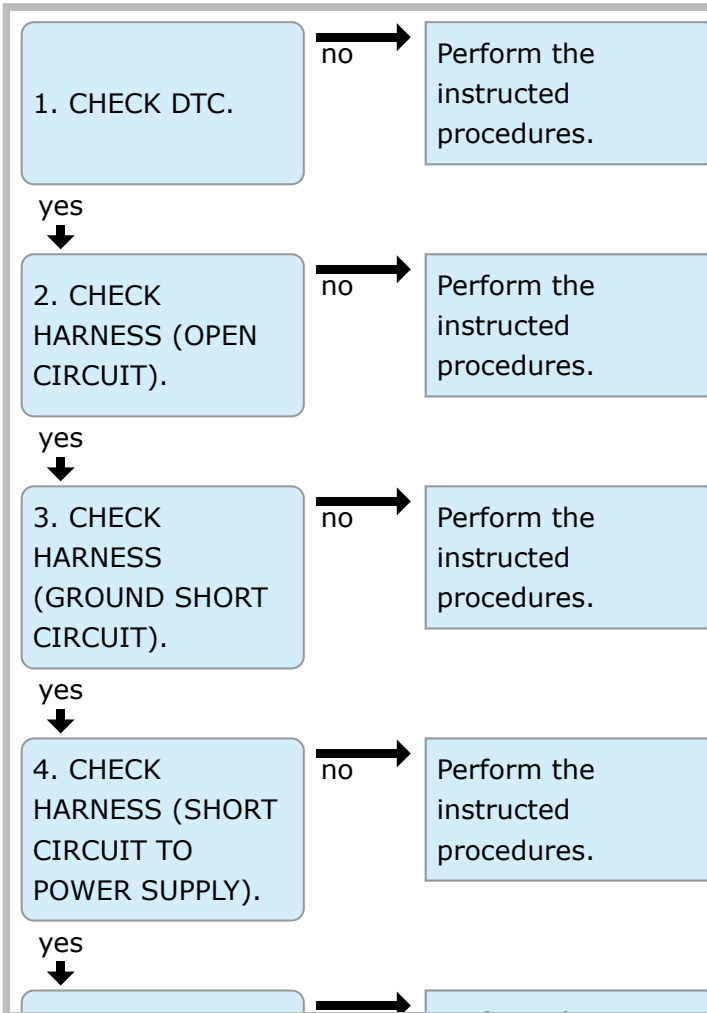
- Caution:**
- Initialization is required after re auto headlight beam leveler CM.
 - After replacing the headlight as headlight beam adjustment is re

START

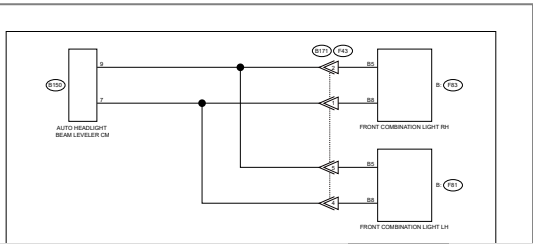
HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2910 STEERING RESPONSIVE HEADLIGHT COMMUNICATION RH

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Headlight beam leveler system [Ref. to V SYSTEM>Headlight Beam Leveler System>V DIAGRAM.](#)



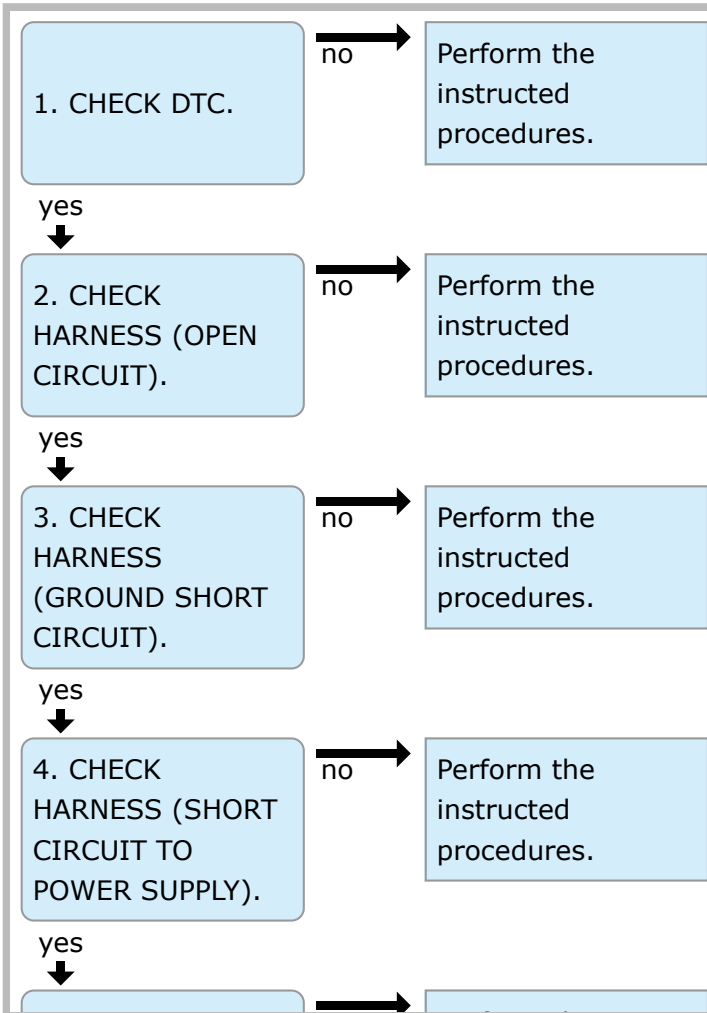
- Caution:**
- Initialization is required after re auto headlight beam leveler CM.
 - After replacing the headlight as headlight beam adjustment is re

START

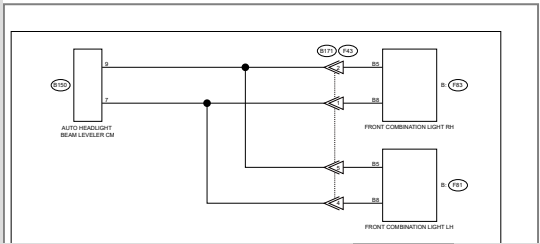
HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2911 STEERING RESPONSIVE HEADLIGHT COMMUNICATION LH

CAUTION/NOTE INTRO



Wiring diagram:
 Headlight beam leveler system [Ref. to V SYSTEM>Headlight Beam Leveler System>V DIAGRAM.](#)



- Caution:**
- Initialization is required after re auto headlight beam leveler CM.
 - After replacing the headlight as headlight beam adjustment is re

START

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

Detected when CAN line abnormality is detected.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

Detected when CAN data (vehicle speed signal) is not received from VDC.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE

Detected when CAN data (headlights ON signal) is not received from the body integrated unit.

Note:

Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

Detected when data (vehicle speed signal) from VDC CM is abnormal.

Note:


Perform the diagnosis for VDC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE

Detected when CAN data (headlights ON signal) is invalid.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Headlight / Foglight], and then select [Enter].
5. On [Select Function] display, select [DTC].

Note:

- For detailed operation procedures, refer to "Application help".
- For details concerning DTC, refer to "List of Diagnostic Trouble Code (DTC)". 
[Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

INSPECTION

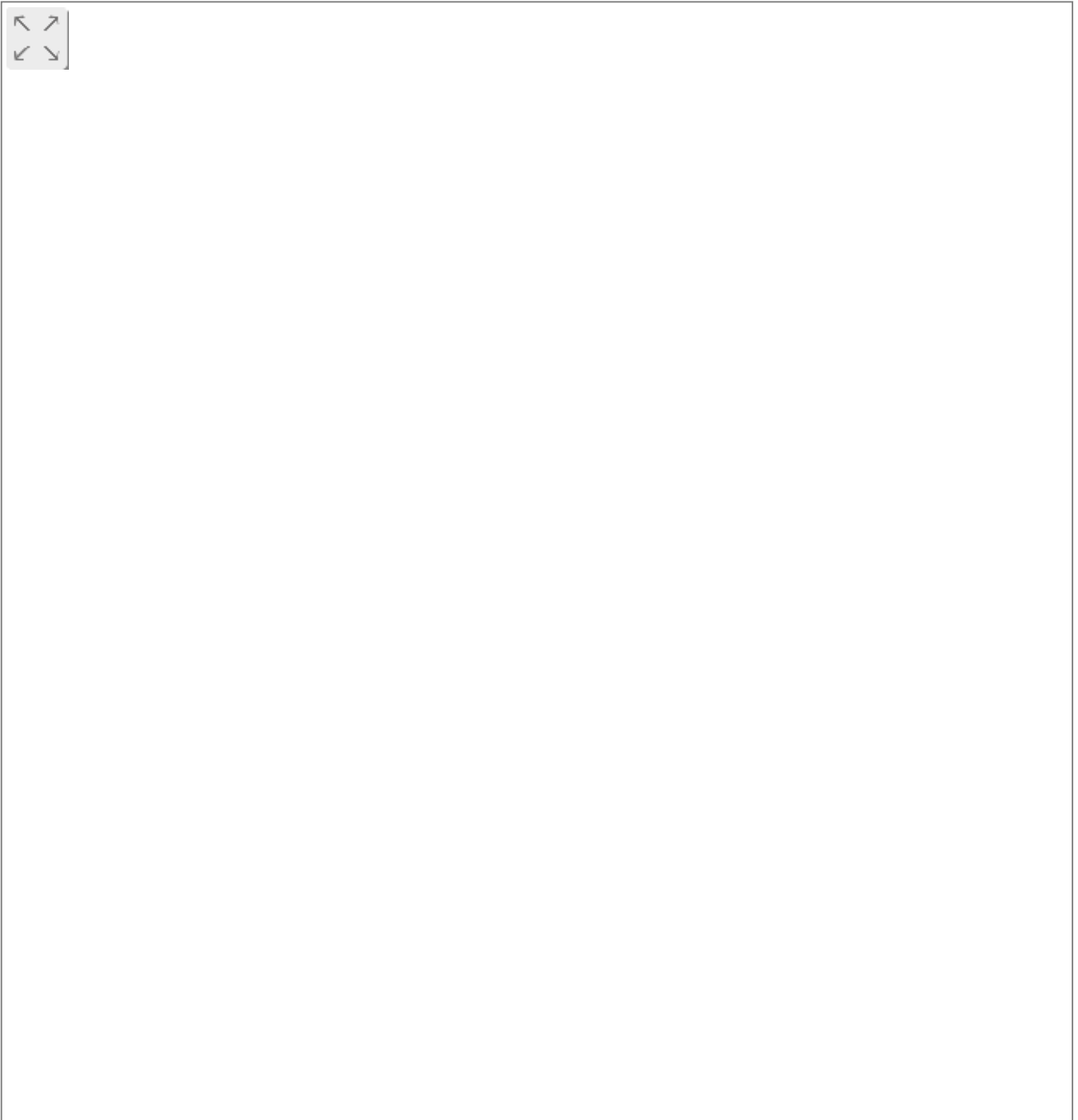
1. THE AUTO HEADLIGHT BEAM LEVELER DOES NOT OPERATE

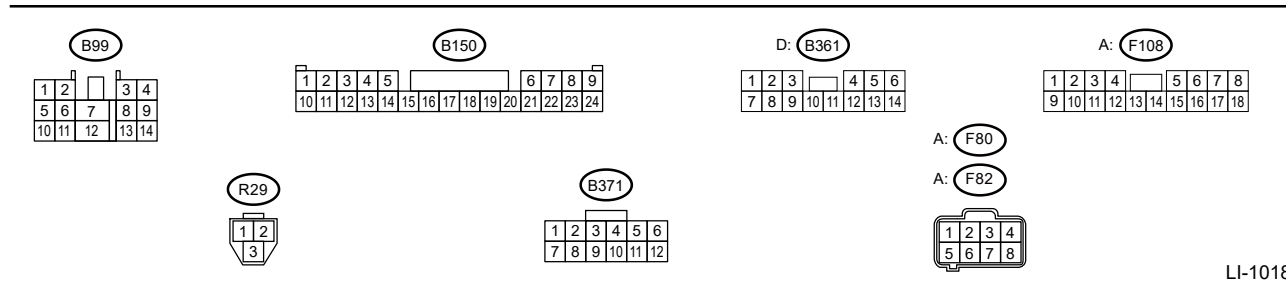
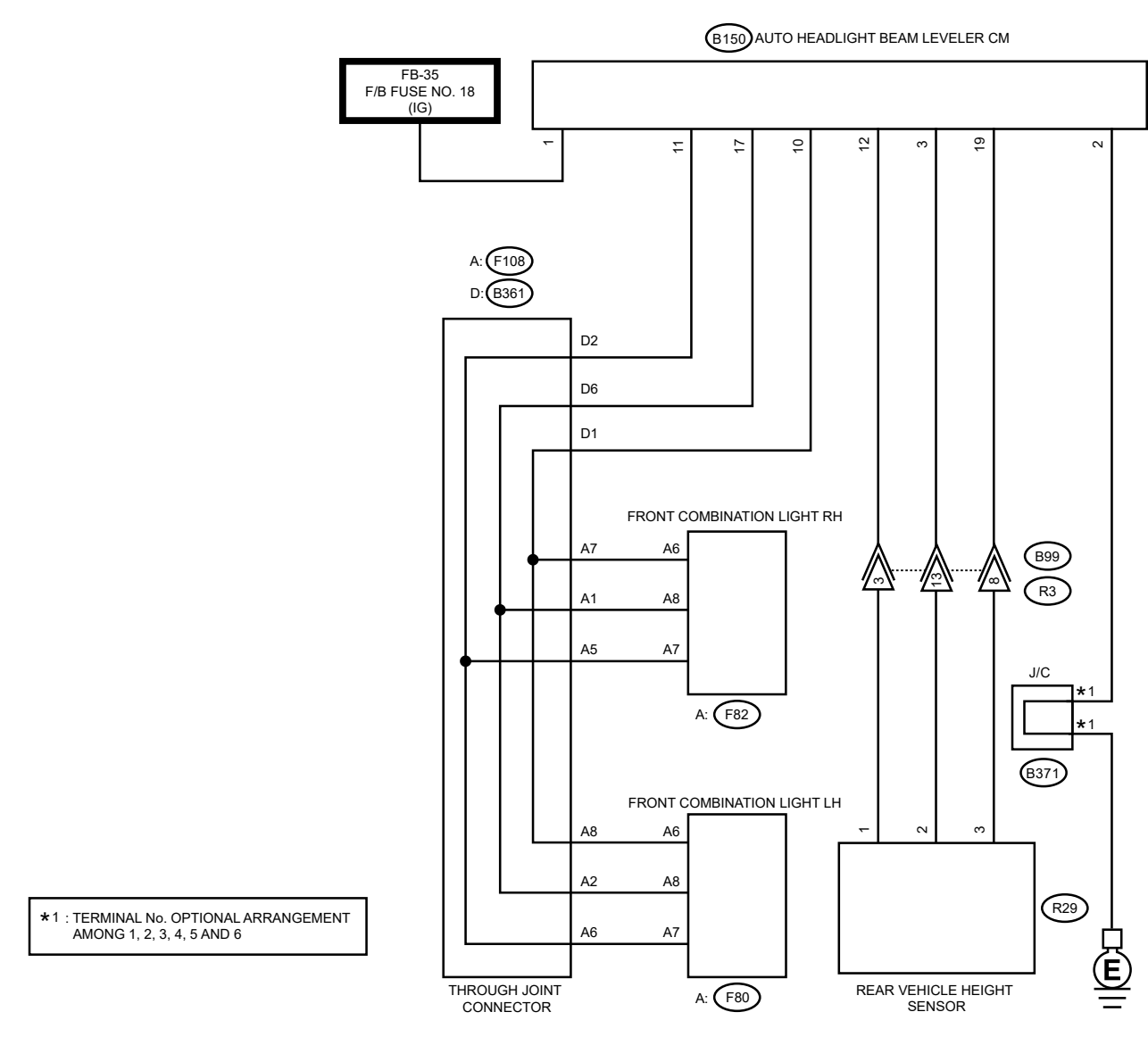
Caution:

- **Before performing diagnosis, check the fuse in this circuit.**
- **Initialization is required after replacing the auto headlight beam leveler CM.**

Wiring diagram:

Headlight beam leveler system  [Ref. to WIRING SYSTEM>Headlight Beam Leveler System>WIRING DIAGRAM.](#)





1. CHECK DATA MONITOR.

Using Subaru Select Monitor, display [Control module voltage]. [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Data Monitor.](#)

Does the data monitor indicate the standard value?

Yes

[Go to 3.](#)

No

 [Go to 2.](#)

2. CHECK HARNESS BETWEEN POWER SUPPLY — AUTO HEADLIGHT BEAM LEVELER CM.


1. Disconnect the auto headlight beam leveler CM connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between the auto headlight beam leveler CM connector and chassis ground.

Connector & terminal

(B150) No. 1 (+) — Chassis ground (-):

Is the voltage 8 — 16 V?

Yes

Replace the auto headlight beam leveler CM.  [Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.](#)

No

Repair or replace the harness.

3. CHECK INDICATOR OUTPUT.

Turn the ignition switch to ON.

Does the warning indicator turn on for three seconds?


Yes

 [Go to 5.](#)

No


 [Go to 4.](#)

4. CHECK DATA MONITOR.


1. Using Subaru Select Monitor, display [Indicator Signal].  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Data Monitor.](#)
2. Turn the ignition switch to ON.

Is it set as ON for 3 seconds?

Yes

Check the combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No

Replace the auto headlight beam leveler CM.  [Ref. to LIGHTING](#)

5. CHECK INDICATOR OUTPUT.


Leave the ignition switch to ON for 10 seconds.

Does the warning indicator light go off?

Yes

 [Go to 6.](#)

No


 [Go to 10.](#)

6. CHECK HEADLIGHT ASSEMBLY (ACTUATOR) DRIVE.

1. Connect the auto headlight beam leveler CM connector.
2. Turn the ignition switch to ON, and within 10 seconds, repeat the OFF → Low beam of headlight switch 5 times.
3. Check that the headlight beam drops once, then returns to normal.
4. Then, after waiting for 30 seconds or more with the ignition ON, turn the ignition switch to OFF.

Does the headlight beam drop down once, and then return?


Yes

Replace the auto headlight beam leveler CM.  [Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.](#)

No

 [Go to 7.](#)

7. CHECK HEADLIGHT ASSEMBLY (ACTUATOR) OUTPUT.


1. Using Subaru Select Monitor, display [Actuator Signal].  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Data Monitor.](#)
2. Turn the ignition switch to ON, and within 10 seconds, repeat the OFF → Low beam of headlight switch 5 times.
3. Check that the headlight beam drops once, then returns to normal.
4. Then, after waiting for 30 seconds or more with the ignition ON, turn the ignition switch to OFF.

Does the current data indicate the standard value? (Does the value change at 10 — 90 %?)

Yes

 [Go to 8.](#)

No

Replace the auto headlight beam leveler CM.  [Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.](#)

8. CHECK OUTPUT VOLTAGE BETWEEN HEADLIGHT ASSEMBLY (ACTUATOR).




1. Disconnect the auto headlight beam leveler CM connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between the auto headlight beam leveler CM connector and chassis ground.

Connector & terminal

(B150) No. 10 (+) — Chassis ground (–):

Is the voltage 8 — 16 V?

Yes

Replace the headlight assembly.  [Ref. to LIGHTING SYSTEM>Headlight Assembly.](#)

No

 [Go to 9.](#)

9. CHECK HARNESS BETWEEN AUTO HEADLIGHT BEAM LEVELER CM AND HEADLIGHT ASSEMBLY (ACTUATOR) (OPEN CIRCUIT).



1. Disconnect the connector of headlight assembly.
2. Measure the continuity between the auto headlight beam leveler CM connector and headlight assembly (actuator) connector.

Connector & terminal

● Headlight beam leveler RH

(B150) No. 10 — (F82) No. 6:

(B150) No. 17 — (F82) No. 8:

(B150) No. 11 — (F82) No. 7:

● Headlight beam leveler LH


(B150) No. 10 — (F80) No. 6:

(B150) No. 17 — (F80) No. 8:

(B150) No. 11 — (F80) No. 7:

Is there continuity?

Yes

Replace the auto headlight beam leveler CM.  [Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.](#)

No

Repair the open circuit or poor contact of the connector in the harness between headlight assembly and auto headlight beam leveler CM.

10. CHECK DTC.



Read the DTC using Subaru Select Monitor. [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC displayed?

Yes

Perform the diagnosis for the displayed DTCs. [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Replace the auto headlight beam leveler CM. [Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.](#)

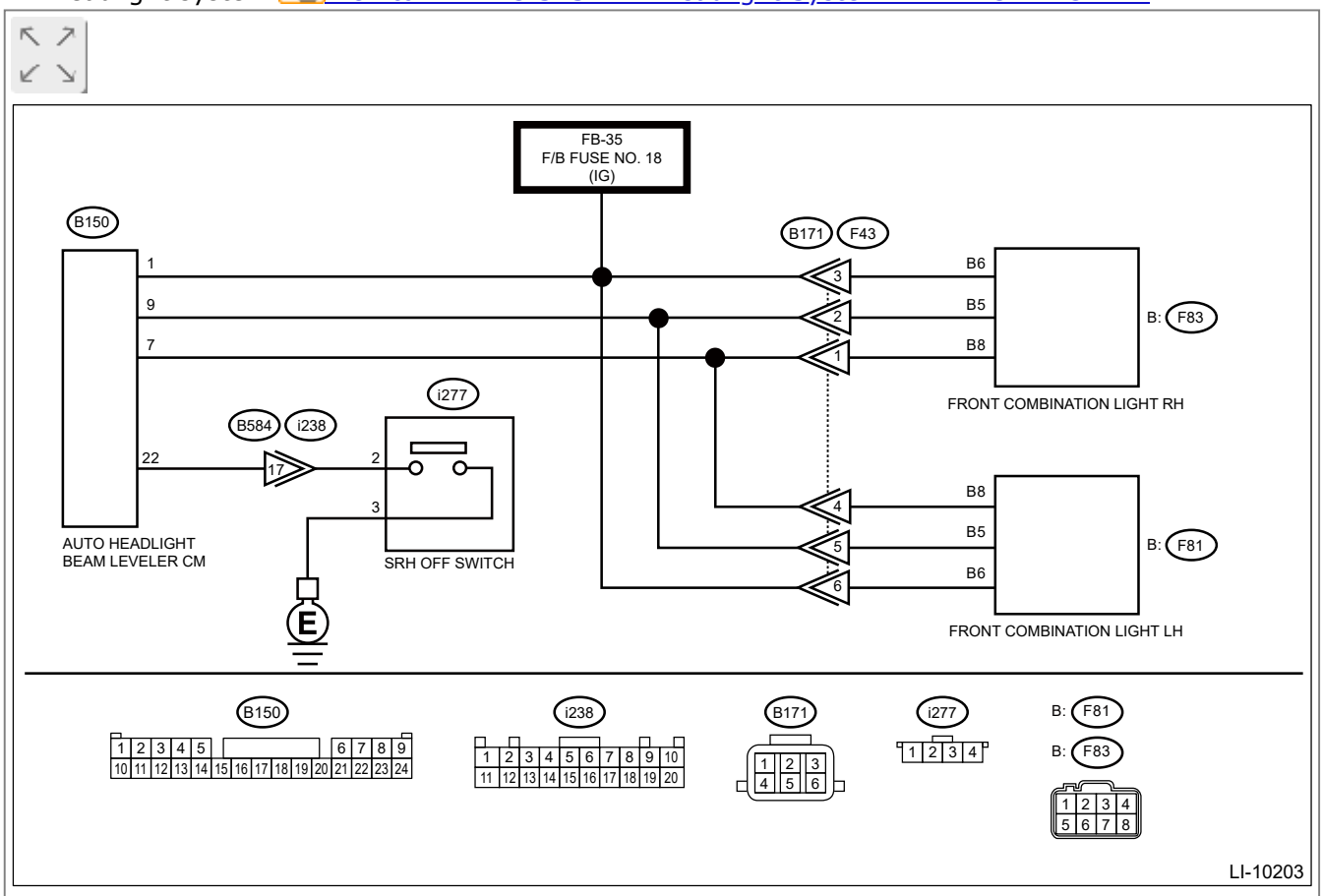
2. THE STEERING RESPONSIVE HEADLIGHT DOES NOT OPERATE

Caution:

- Initialization is required after replacing the auto headlight beam leveler CM.
- After replacing the headlight assembly, headlight beam adjustment is required.

Wiring diagram:

- Headlight beam leveler system [Ref. to WIRING SYSTEM>Headlight Beam Leveler System>WIRING DIAGRAM.](#)
- Headlight system [Ref. to WIRING SYSTEM>Headlight System>WIRING DIAGRAM.](#)



LI-10203

1. CHECK DTC.



1. Turn the ignition switch to OFF.
2. Start the engine.
3. Using the Subaru Select Monitor, clear the memory of Headlight / Foglight. [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Clear memory.](#)
4. Read the DTC using Subaru Select Monitor. [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC of Headlight / Foglight displayed? (Current malfunction)

Yes

Perform the diagnosis for the displayed DTCs. [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 2.](#)

2. CHECK DTC.



1. Read the all DTCs using the Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC of U-code displayed? (Current malfunction)

Yes

Perform the diagnosis for LAN system. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No

[Go to 3.](#)

3. CHECK DTC.



Check DTC of VDC. [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any DTC related to the vehicle speed and steering angle sensor detected?

Yes


Perform the diagnosis for the displayed DTCs. [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 4.](#)

4. CHECK INITIALIZE FUNCTION.





Perform the function check (the initialize function) for the steering responsive headlight.  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Check List for Interview>CHECK > STEERING RESPONSIVE HEADLIGHT.](#)

Do the left and right headlights operate?


Yes

 [Go to 6.](#)

No

- Only one side does not operate:  [Go to 5.](#)
- Both sides do not operate:  [Go to 6.](#)

5. CHECK SWIVEL ACTUATOR POWER SUPPLY.


Using the Subaru Select Monitor, display [Left Steering Responsive Headlight Power Supply Failure], [Right Steering Responsive Headlight Power Supply Failure].  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Data Monitor.](#)

Is [FAIL] displayed?


Yes

Check the battery and fuse. If no fault is found, check the swivel actuator power supply circuit.

No

 [Go to 12.](#)

6. CHECK SRH OFF SWITCH.

Using Subaru Select Monitor, display [SRH-OFF SW].  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Data Monitor.](#)

Is [ON] displayed when the ignition switch is turned OFF → ON?

Yes

 [Go to 8.](#)

No

 [Go to 7.](#)

7. CHECK SRH OFF SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the SRH OFF switch connector.
3. Disconnect the auto headlight beam leveler CM connector.
4. Using a tester, measure the resistance between the auto headlight beam leveler CM

connector and the SRH OFF switch connector, and between the SRH OFF switch connector and chassis ground.

Connector & terminal

(B150) No. 22 — (i277) No. 2:


(i277) No. 3 — Chassis ground:

Is the resistance less than 1 Ω ?


Yes

Repair or replace the open circuit of harness.

No




Perform unit inspection of the SRH OFF switch.  [Ref. to LIGHTING SYSTEM>SRF OFF Switch.](#)

8. CHECK REVERSE SIGNAL.

1. Using the Subaru Select Monitor, display [MT Reverse SW] for MT model, and [Shift Position Signal] for CVT model.  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Data Monitor.](#)
2. Place the shift in reverse.

For MT model, is [ON] displayed? For CVT model, is [R] displayed?


Yes

For MT model, check the reverse switch or reverse switch harness.  [Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL\(6MT\)>Switches and Harness.](#)
For CVT model, perform the diagnosis for CVT.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)
When DTC is not stored, check the inhibitor switch or inhibitor switch harness.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Inhibitor Switch.](#)

No


 [Go to 9.](#)

9. CHECK SWIVEL ACTUATOR POWER SUPPLY.


Using the Subaru Select Monitor, display [Left Steering Responsive Headlight Power Supply Failure], [Right Steering Responsive Headlight Power Supply Failure].  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Data Monitor.](#)

Is [FAIL] displayed?

Yes

 [Go to 10.](#)

No

 [Go to 11.](#)

10. CHECK SWIVEL ACTUATOR POWER SUPPLY CIRCUIT.



1. Turn the ignition switch to OFF.
2. Disconnect the headlight assembly connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between headlight assembly connector and chassis ground.

Connector & terminal

(F83) No. 6 (+) — Chassis ground (—):

(F81) No. 6 (+) — Chassis ground (—):

Is the voltage 8 — 16 V?

Yes

[Go to 11.](#)

No

Check the battery and fuse. If no fault is found, check the swivel actuator power supply circuit.

11. CHECK SRH OPERATION.



1. Turn the ignition switch to OFF.
2. Connect all the disconnected connectors.
3. Drive the vehicle to verify on which side, LH side or RH side, the SRH improper operation occurred.

Note:

At night, drive a curve of steering wheel angle approximately 45 degrees or more with vehicle speed at 40 km/h (25 MPH) or more, or drive a curve of steering wheel angle approximately 80 degrees or more with vehicle speed at 15 km/h (9 MPH) or more to check the SRH operation.

Is the improper operation occurring on either left or right side only?

Yes

Perform «VSC(VDC) Centering Mode». [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\)>ADJUSTMENT.](#)

No

If the fault is not fixed even after the process: [Go to 12.](#)

12. PERFORM ACTIVE TEST FOR SWIVEL ACTUATOR.




Using the Subaru Select Monitor, perform [Right Steering Responsive Headlight][Left Steering Responsive Headlight]. [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Active](#)


Test.


Is the actuator current position value approximately the same as the input value of the actuator control position? (Within 1.2 seconds)

Yes


 [Go to 14.](#)

No

When the value is not the same on one side only, replace the headlight assembly of the side where the same value is not achieved.  [Ref. to LIGHTING SYSTEM>Headlight Assembly.](#)


When the value is not the same on both sides,  [Go to 13.](#)

13. CHECK AUTO HEADLIGHT BEAM LEVELER CM POWER SUPPLY.

1. Turn the ignition switch to ON.
2. Using Subaru Select Monitor, display [Control module voltage].  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Data Monitor.](#)

Is the voltage 8 — 16 V?

Yes

Replace the auto headlight beam leveler CM.  [Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.](#)

No

Check the battery and fuse. If no fault is found, check the auto headlight beam leveler CM power supply circuit.

14. DRIVING CHECK.

Perform the road test to make sure there is no yawing.

Is it yawing?

Yes

Check the vehicle alignment.  [Ref. to FRONT SUSPENSION>Wheel Alignment.](#)

No

The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:



In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

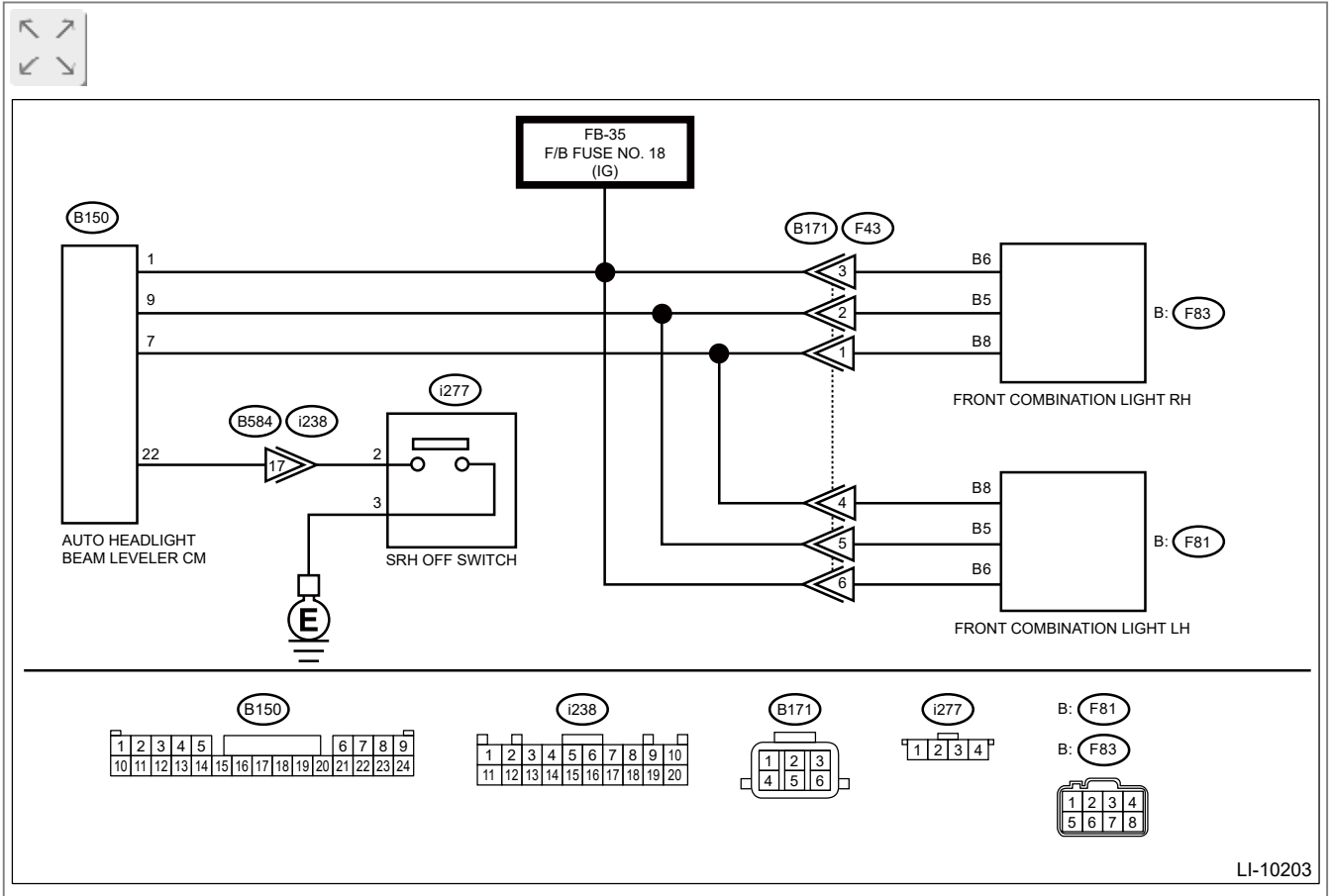
3. THE STEERING RESPONSIVE HEADLIGHT OPERATES IN A DIRECTION DIFFERENT FROM THE TARGET

Caution:



- Initialization is required after replacing the auto headlight beam leveler CM.
- After replacing the headlight assembly, headlight beam adjustment is required.

Wiring diagram:

- Headlight beam leveler system  Ref. to [WIRING SYSTEM>Headlight Beam Leveler System>WIRING DIAGRAM.](#)
- Headlight system  Ref. to [WIRING SYSTEM>Headlight System>WIRING DIAGRAM.](#)




1. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Start the engine.
3. Using the Subaru Select Monitor, clear the memory of Headlight / Foglight.  Ref. to [HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Clear memory.](#)
4. Read the DTC using Subaru Select Monitor.  Ref. to [HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC for Headlight / Foglight displayed? (Current malfunction)


Yes

Perform the diagnosis for the displayed DTCs.  Ref. to [HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


 [Go to 2.](#)

2. CHECK DTC.


1. Read the all DTCs using the Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC of U-code displayed? (Current malfunction)


Yes

Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No

 [Go to 3.](#)

3. CHECK DTC.


Read DTC of the VDC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any DTC related to the vehicle speed and steering angle sensor displayed?


Yes

Perform the diagnosis for the displayed DTCs.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 4.](#)

4. CHECK INITIALIZE FUNCTION.



Perform the function check (the initialize function) for the steering responsive headlight.  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Check List for Interview>CHECK > STEERING RESPONSIVE HEADLIGHT.](#)

Do the left and right headlights operate?


Yes

 [Go to 5.](#)

No

- Only one side does not operate:  [Go to 13.](#)
- Both sides do not operate:  [Go to 12.](#)

5. CHECK INPUT SIGNAL.


Using the Subaru Select Monitor, display [Vehicle speed signal], [Steering Angle Signal].  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Data Monitor.](#)

Is [Vehicle speed signal] 8 km/h (5 MPH) or less, and [Steering Angle Signal] 8.5 deg or less?


Yes

 [Go to 6.](#)

No

Perform the diagnosis for VDC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

6. CHECK SWIVEL ACTUATOR POWER SUPPLY.

Using the Subaru Select Monitor, display [Left Steering Responsive Headlight Target Angle], [Right Steering Responsive Headlight Target Angle].  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Data Monitor.](#)

Is the target angle 0 degree?


Yes

 [Go to 9.](#)

No

 [Go to 7.](#)

7. CHECK AUTO HEADLIGHT BEAM LEVELER CM POWER SUPPLY.

1. Turn the ignition switch to ON.
2. Using Subaru Select Monitor, display [Control module voltage].  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Data Monitor.](#)

Is the voltage 8 — 16 V?

Yes

 [Go to 8.](#)

No

Check the battery and fuse. If no fault is found, check the auto headlight beam leveler CM power supply circuit.

8. CHECK SWIVEL ACTUATOR POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the headlight assembly connector.
3. Turn the ignition switch to ON.

4. Using a tester, measure the voltage between headlight assembly connector and chassis ground.


Connector & terminal

(F83) No. 6 (+) — Chassis ground (–):

(F81) No. 6 (+) — Chassis ground (–):

Is the voltage 8 — 16 V?


Yes

Replace the auto headlight beam leveler CM.  [Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.](#)

No


Check the battery and fuse. If no fault is found, check the swivel actuator power supply circuit.

9. CHECK SRH SWIVEL ACTUATOR CURRENT ANGLE.

Using the Subaru Select Monitor, display [Left Steering Responsive Headlight Current Angle], [Right Steering Responsive Headlight Current Angle].  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Data Monitor.](#)

Is the current angle 0 degree?


Yes

 [Go to 12.](#)

No

 [Go to 9.](#)

10. CHECK SWIVEL ACTUATOR POWER SUPPLY.


Using the Subaru Select Monitor, display [Left Steering Responsive Headlight Power Supply Failure], [Right Steering Responsive Headlight Power Supply Failure].  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Data Monitor.](#)

Is [FAIL] displayed?

Yes

Check the battery and fuse. If no fault is found, check the swivel actuator power supply circuit.

No

 [Go to 11.](#)

11. CHECK SWIVEL ACTUATOR POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.

2. Disconnect the headlight assembly connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between headlight assembly connector and chassis ground.


Connector & terminal

(F83) No. 6 (+) — Chassis ground (—):

(F81) No. 6 (+) — Chassis ground (—):

Is the voltage 8 — 16 V?


Yes

Replace the headlight assembly.  [Ref. to LIGHTING SYSTEM>Headlight Assembly.](#)

No


Check the battery and fuse. If no fault is found, check the swivel actuator power supply circuit.

12. CHECK AUTO HEADLIGHT BEAM LEVELER CM POWER SUPPLY.

1. Turn the ignition switch to OFF.
2. Using Subaru Select Monitor, display [Control module voltage].  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Data Monitor.](#)

Is the voltage 8 — 16 V?


Yes

 [Go to 13.](#)

No

Check the battery and fuse. If no fault is found, check the auto headlight beam leveler CM power supply circuit.

13. CHECK SWIVEL ACTUATOR POWER SUPPLY.


Using the Subaru Select Monitor, display [Left Steering Responsive Headlight Power Supply Failure], [Right Steering Responsive Headlight Power Supply Failure].  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Data Monitor.](#)

Is [FAIL] displayed?

Yes

Check the battery and fuse. If no fault is found, check the swivel actuator power supply circuit.

No

 [Go to 14.](#)

14. CHECK SWIVEL ACTUATOR POWER SUPPLY CIRCUIT.



1. Turn the ignition switch to OFF.
2. Disconnect the headlight assembly connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between headlight assembly connector and chassis ground.

Connector & terminal

(F83) No. 6 (+) — Chassis ground (—):

(F81) No. 6 (+) — Chassis ground (—):

Is the voltage 8 — 16 V?

Yes

[Go to 15.](#)

No

Check the battery and fuse. If no fault is found, check the swivel actuator power supply circuit.

15. PERFORM ACTIVE TEST FOR SWIVEL ACTUATOR.



Using the Subaru Select Monitor, perform the active test. [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Active Test.](#)

Is the actuator current position value approximately the same as the input value of the actuator control position? (Within 1.2 seconds)

Yes

[Go to 16.](#)

No

When the value is not the same on one side only, replace the headlight assembly of the side where the same value is not achieved. [Ref. to LIGHTING SYSTEM>Headlight Assembly.](#)

When the value is not the same on both sides, replace the auto headlight beam leveler CM. [Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.](#)

16. DRIVING CHECK.



Perform the road test to make sure there is no yawing.

Is it yawing?

Yes

Check the vehicle alignment. [Ref. to FRONT SUSPENSION>Wheel Alignment.](#)

No




The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

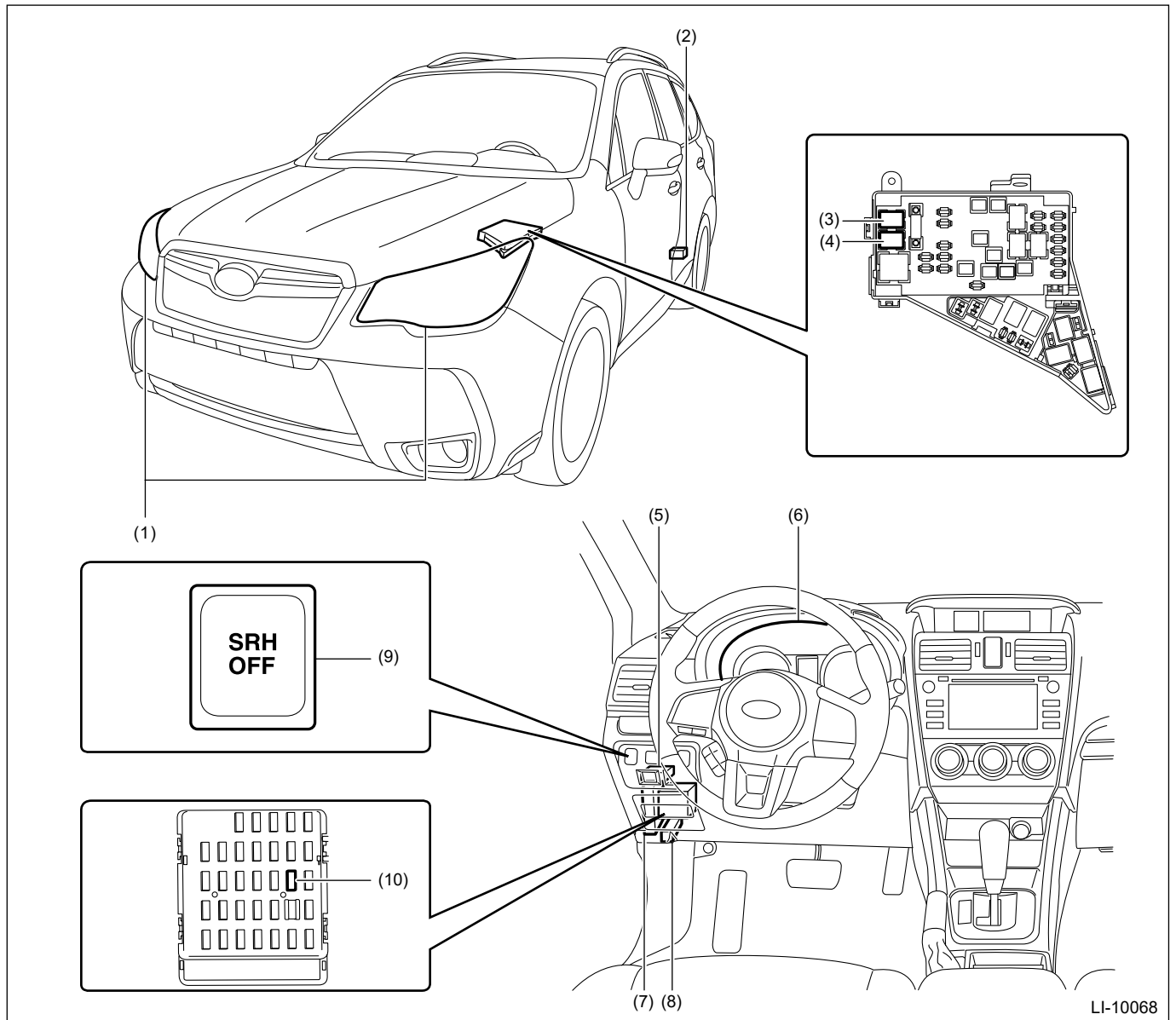
HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostics with Phenomenon

LIST

Symptoms	Reference
1. The auto headlight beam leveler does not operate.	 Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE AUTO HEADLIGHT BEAM LEVELER DOES NOT OPERATE.
2. The steering responsive headlight does not operate.	 Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE STEERING RESPONSIVE HEADLIGHT DOES NOT OPERATE.
3. The steering responsive headlight operates in a direction different from the target.	 Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE STEERING RESPONSIVE HEADLIGHT OPERATES IN A DIRECTION DIFFERENT FROM THE TARGET.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Electrical Component Location

LOCATION



LI-10068

- | | | |
|--|------------------------------------|--|
| (1) Headlight ASSY
- Headlight beam leveler actuator
- SRH swivel actuator | (5) Auto headlight beam leveler CM | (8) Data link connector |
| (2) Rear vehicle height sensor | (6) Combination meter | (9) SRH OFF switch |
| (3) Headlight relay (Hi) | (7) Body integrated unit | (10) Fuse 10A (auto headlight beam leveler CM) |
| (4) Headlight relay (Lo) | | |

CAUTION

1. AIRBAG SYSTEM

Caution:




- **Do not use the electrical test equipment on the airbag system wiring harnesses and connector circuits.**
- **Be careful not to damage the airbag system wiring harness.**

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > General Description

INSPECTION

1. BASIC INSPECTION

Before performing the diagnosis, check the following items which may cause problems relating the wiper or light.

1. Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DOTC\)>General Description.](#)  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)
2. Check the relay and fuse condition.  [Ref. to LIGHTING SYSTEM>Relay and Fuse.](#)
3. Check the connecting condition of harness and harness connector.


2. FUNCTION CHECK

- AUTO HEADLIGHT BEAM LEVELER SYSTEM
 1. Turn the ignition switch to ON.
 2. Turn on the headlight low beam.
 3. Check that the beam axes move when the vehicle condition is kept for three seconds or more after the vehicle posture is changed with the vehicle stopped.
- LED headlight system
 1. Turn the ignition switch to ON.
 2. Turn on the headlight low beam.
 3. Check that the headlight Low beam illuminates with normal brightness.
- Steering responsive headlight (the initialize function)
 1. Stop the vehicle at approximately 1 m (3.3 ft) away and perpendicular to the wall.
 2. Make the vehicle vicinity dark.
 3. Set the vehicle headlight switch to Low beam.
 4. Make sure that the headlight cut line moves to left and right immediately after the engine started.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL











ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	— (Newly adopted tool)	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".




2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > List of Diagnostic Trouble Code (DTC)

LIST

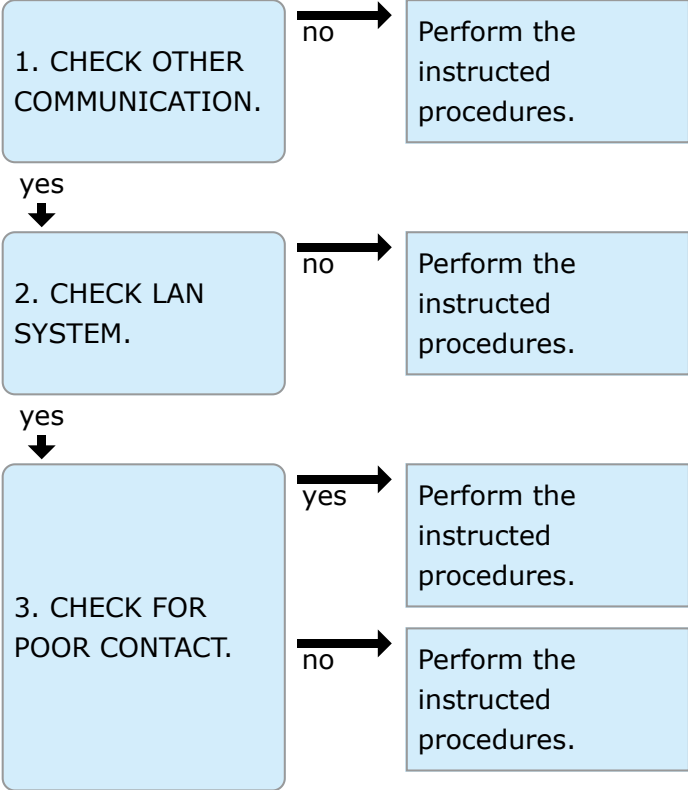
DTC	Item	Reference
B2900	AHL CONTROL	 Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2900 AHL CONTROL.
B2902	REAR HEIGHT SENSOR CIRCUIT	 Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2902 REAR HEIGHT SENSOR CIRCUIT.
B2904	LED HEADLAMP(RH) ERROR	 Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2904 LED HEADLAMP(RH) ERROR.
B2905	LED HEADLAMP(LH) ERROR	 Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2905 LED HEADLAMP(LH) ERROR.
B2908	STEERING RESPONSIVE HEADLIGHT ACTUATOR RH	 Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2908 STEERING RESPONSIVE HEADLIGHT ACTUATOR RH.
B2909	STEERING RESPONSIVE HEADLIGHT ACTUATOR LH	 Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2909 STEERING RESPONSIVE HEADLIGHT ACTUATOR LH.
B2910	STEERING RESPONSIVE HEADLIGHT COMMUNICATION RH	 Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2910 STEERING RESPONSIVE HEADLIGHT COMMUNICATION RH.
B2911	STEERING RESPONSIVE HEADLIGHT COMMUNICATION LH	 Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2911 STEERING RESPONSIVE HEADLIGHT COMMUNICATION LH.
U0073	CAN FAILURE, BUS 'OFF' DETECTION	 Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	 Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.

U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	 Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	 Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE	 Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Subaru Select Monitor

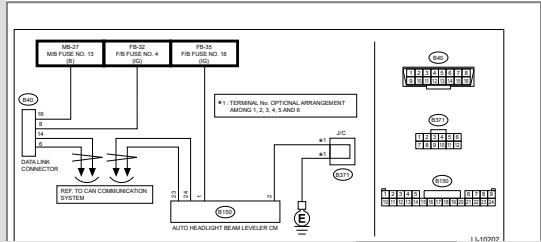
INSPECTION

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

Headlight beam leveler system [Ref. to V SYSTEM>Headlight Beam Leveler System>V DIAGRAM.](#)




Caution:
Initialization is required after repla headlight beam leveler CM.

START

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Subaru Select Monitor

OPERATION

- For detailed operation procedures, refer to "Application help".
- If the auto headlight beam leveler CM cannot communicate with Subaru Select Monitor, check the communication circuit.  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Subaru Select Monitor>INSPECTION.](#)

PROCEDURE

1. MODEL WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM

Caution:

When the body integrated unit is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CONFIRM NUMBER OF REGISTERED IMMOBILIZER KEY.



Confirm the number of registered immobilizer key. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is the number of registration 0?

Yes

Register the immobilizer system.

No

 [Go to 2.](#)

2. CHECK SECURITY INDICATOR LIGHT.




1. Remove the ignition key from ignition switch.
2. Wait at least 60 seconds.

Does the security indicator light blink?

Yes

 [Go to 3.](#)

No

Check the security indicator light circuit.  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostics Chart for Security Indicator Light>INSPECTION > CHECK SECURITY INDICATOR LIGHT CIRCUIT.](#)


3. CHECK KEY SWITCH.



Insert the ignition key in the ignition switch. (OFF or ACC)

Does the security indicator light remain blinking?

Yes

Check the key switch circuit.  [Ref. to IMMOBILIZER](#)

[\(DIAGNOSTICS\)>Diagnostics Chart for Security Indicator Light>INSPECTION > CHECK KEY SWITCH CIRCUIT.](#)

No

 [Go to 4.](#)

4. CHECK SECURITY INDICATOR LIGHT.

Check the security indicator light status in the condition of step 3.

Does the security indicator light go off?

Yes

 [Go to 7.](#)

No

 [Go to 5.](#)

5. CHECK SECURITY INDICATOR LIGHT.

Turn the ignition switch to ON.

Does the security indicator light go off?

Yes

 [Go to 7.](#)

No


 [Go to 6.](#)

6. CHECK ENGINE START.

Turn the ignition switch to START.

Does the starter operate?

Yes

Check the LAN communication system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No

 [Go to 8.](#)

7. CHECK ENGINE START.

Turn the ignition switch to START.

Does the engine start?


Yes

Immobilizer system is normal.


No

 [Go to 9.](#)

8. CHECK DTC.

Read the DTC of body integrated unit and ECM and time stamp using Subaru Select Monitor.  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Note:

For time stamp, refer to "LAN SYSTEM".  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>General Description>CAUTION > TIME STAMP.](#)

Are any DTCs displayed?


Yes

 [Go to 10.](#)


No

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

9. CHECK DTC.


Read the DTC of body integrated unit and ECM and time stamp using Subaru Select Monitor.  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Note:


For time stamp, refer to "LAN SYSTEM".  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>General Description>CAUTION > TIME STAMP.](#)

Are any DTCs displayed?

Yes

 [Go to 10.](#)


No

Perform the diagnosis for engine system.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DQ\)>Basic Diagnostic Procedure>PROCEDURE > ENGINE.](#)

10. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, check the Freeze Frame Data.

Are the data recorded?

Yes Record the data.  [Go to 11.](#)

No  [Go to 11.](#)

11. CHECK DTC.




Check the displayed DTC.

Are DTCs irrelevant to the immobilizer displayed?


Yes Perform the diagnosis according to DTCs irrelevant to the immobilizer first.

No  [Go to 12.](#)

12. PERFORM DIAGNOSIS.

1. Inspect using the "Diagnostic Procedure with Diagnostic Trouble Code (DTC)".  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\).](#)
2. Repair the trouble cause.
3. Clear the memory.  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Clear memory.](#)
4. Read DTCs again.  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)


Are any DTCs displayed?

Yes Inspect using the "Diagnostic Procedure with Diagnostic Trouble Code (DTC)".  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\).](#)

No Finish the diagnosis.

2. MODEL WITH KEYLESS ACCESS

Note:

For immobilizer diagnosis of model with the keyless access with push button start system, refer to “Keyless Access with Push Button Start System”.  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

IMMOBILIZER (DIAGNOSTICS) > Clear memory

OPERATION

Note:

For detailed operation procedures, refer to "Application help".

1. ECM

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Engine Control System], and then select [Enter].
5. On [Engine Control System] display, select [DTC].
6. On [DTC] display, select [Clear memory].

Note:

Initial diagnosis of electronic throttle control is performed after memory clearance. Wait for 10 seconds or more after turning the ignition switch to ON, and then start the engine.

2. BODY INTEGRATED UNIT

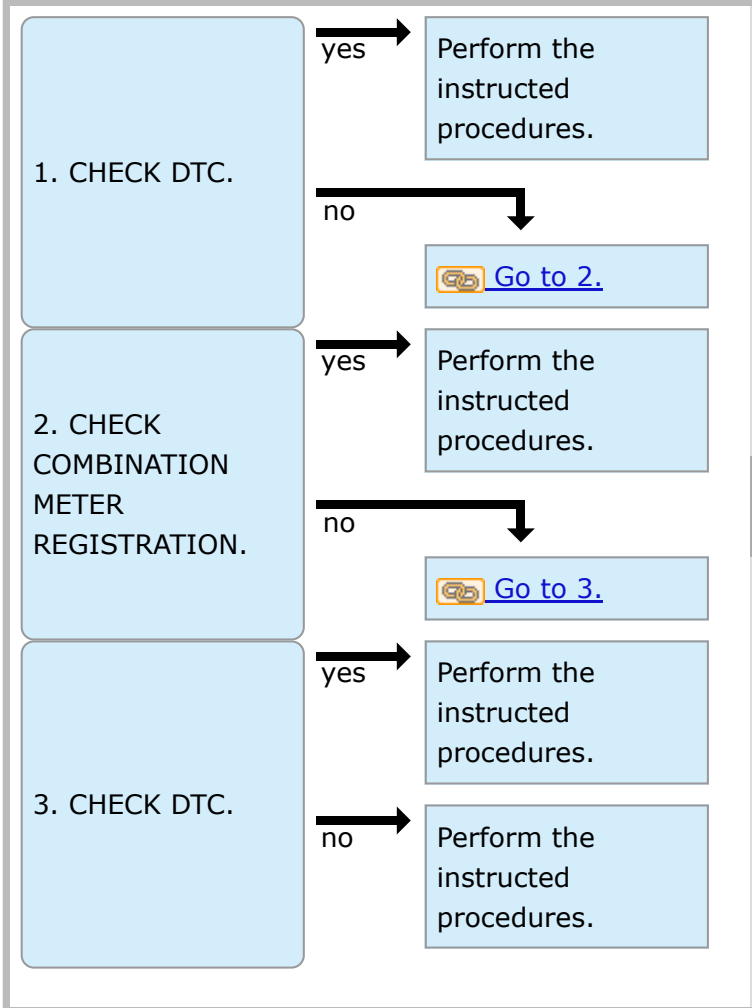
1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Body Control], and then select [Enter].
5. On [Body Control] display, select [DTC].
6. On [DTC] display, select [Clear memory].

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1401 METER COLLATION

CAUTION/NOTE

INTRO



Caution:
When the combination meter is re-registered of the immobilizer system required. For details, refer to the "REGISTRATION MANUAL FOR IMM" provided as a separate volume.

START

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC B1402 IMMOBILIZER KEY COLLATION

DTC detecting condition:

- Incorrect immobilizer key (use of unregistered key in body integrated unit)
- Faulty antenna
- Communication failure between key and body integrated unit



1. CHECK DTC.




Read the DTC of the body integrated unit.  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1410 or B1411 displayed?

Yes

Perform the diagnosis for the displayed DTC B1410 or B1411.  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1410 TRANSPONDER COMMUNICATION.](#)  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1411 IMMOBILIZER ANTENNA.](#)

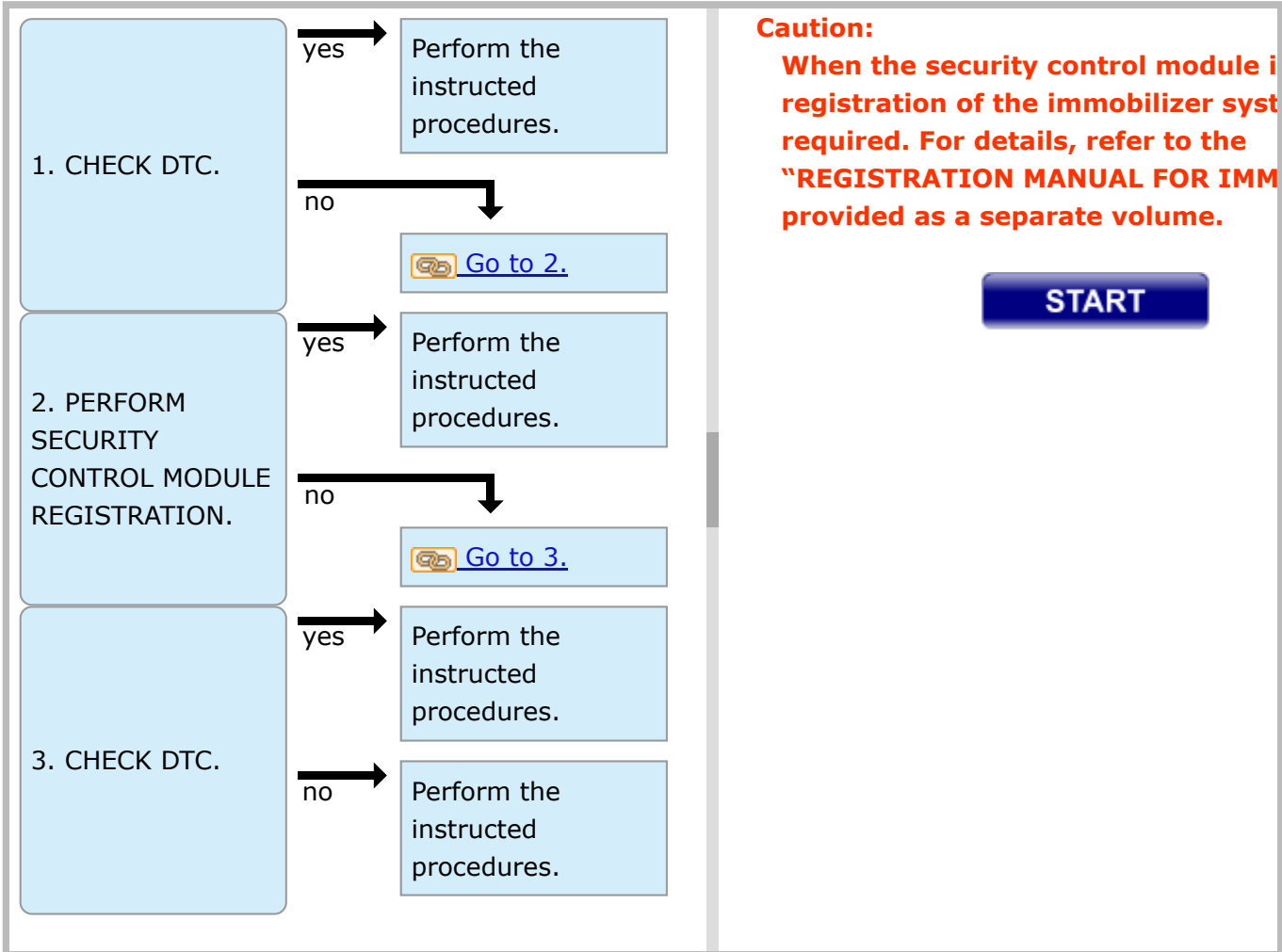
No

Perform the diagnosis of DTC B1575.  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1575 INCORRECT IMMOBILIZER KEY.](#)

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1405 SCU COLLATION

[CAUTION/NOTE](#) [INTRO](#)

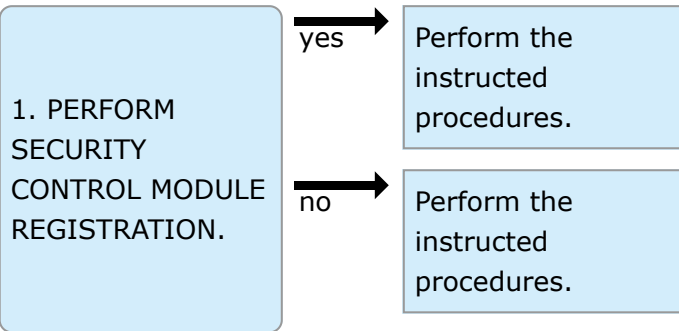


IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1406 SCU_EEPROM

CAUTION/NOTE

INTRO



Caution:

When the security control module i registration of the immobilizer syst required. For details, refer to the "REGISTRATION MANUAL FOR IMM provided as a separate volume.

START

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1407 MET COMMUNICATION


DTC detecting condition:

Communication failure between body integrated unit and combination meter

Caution:

When the combination meter is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK DTC.

Read the DTC of the body integrated unit.  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is a DTC other than DTC B1407 displayed?

Yes

Perform the diagnosis for DTC other than DTC B1407.

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1408 METER NON-VOLATILE MEMORY

CAUTION/NOTE

INTRO

1. CHECK COMBINATION METER REGISTRATION.

yes →

Perform the instructed procedures.

no →

Perform the instructed procedures.

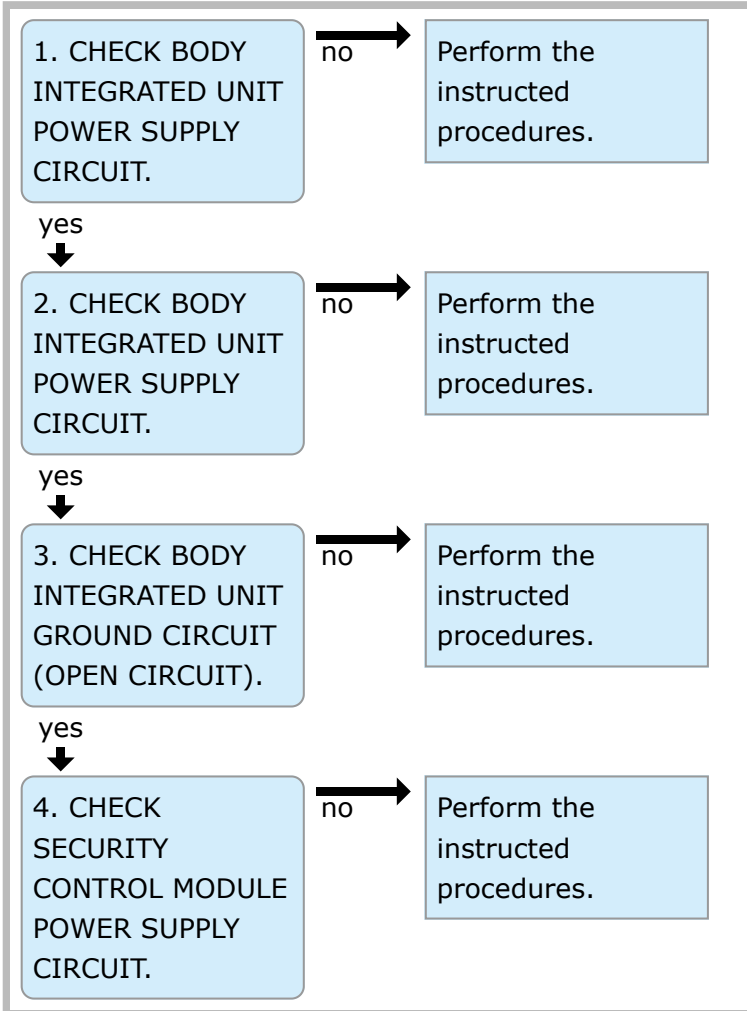
Caution:
When the combination meter is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMM" provided as a separate volume.

START

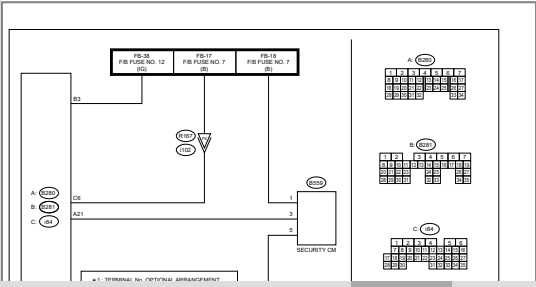
IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1409 SCU COMMUNICATION

CAUTION/NOTE INTRO



Wiring diagram:
 Immobilizer system [Ref. to WIRING SYSTEM>Immobilizer System>WIRING DIAG](#)




Caution:
 When the body integrated unit is re registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMM" provided as a separate volume.

START

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1410 TRANSPONDER COMMUNICATION


Note:

Refer to DTC B1574 for diagnostic procedure.  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1574 KEY COMMUNICATION.](#)

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1411 IMMOBILIZER ANTENNA

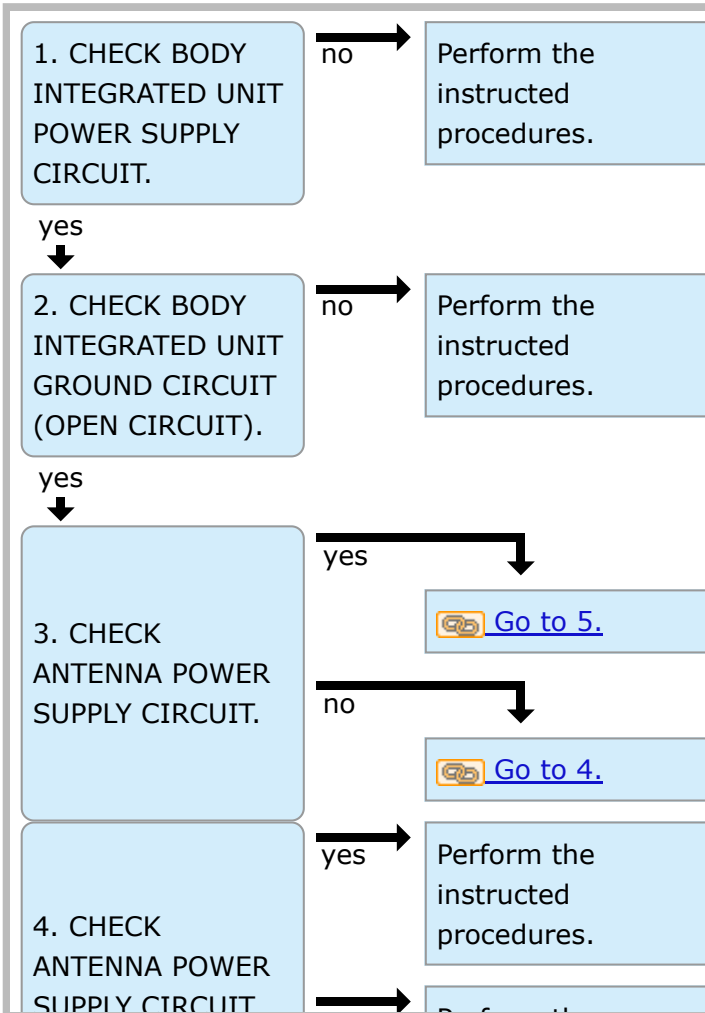
Note:

Refer to DTC B1570 for diagnostic procedure.  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1570 ANTENNA.](#)

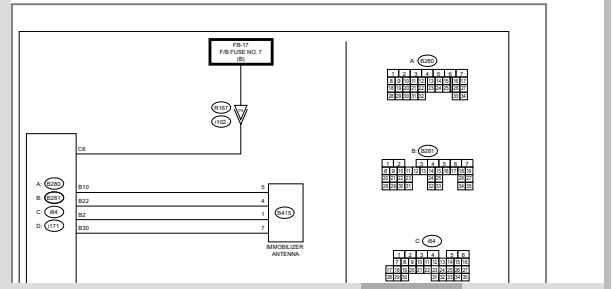
IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1570 ANTENNA

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Immobilizer system [Ref. to WIRING SYSTEM>Immobilizer System>WIRING DIAGRAM](#)



Caution:
 When the body integrated unit is re-registered of the immobilizer system, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMM" provided as a separate volume.

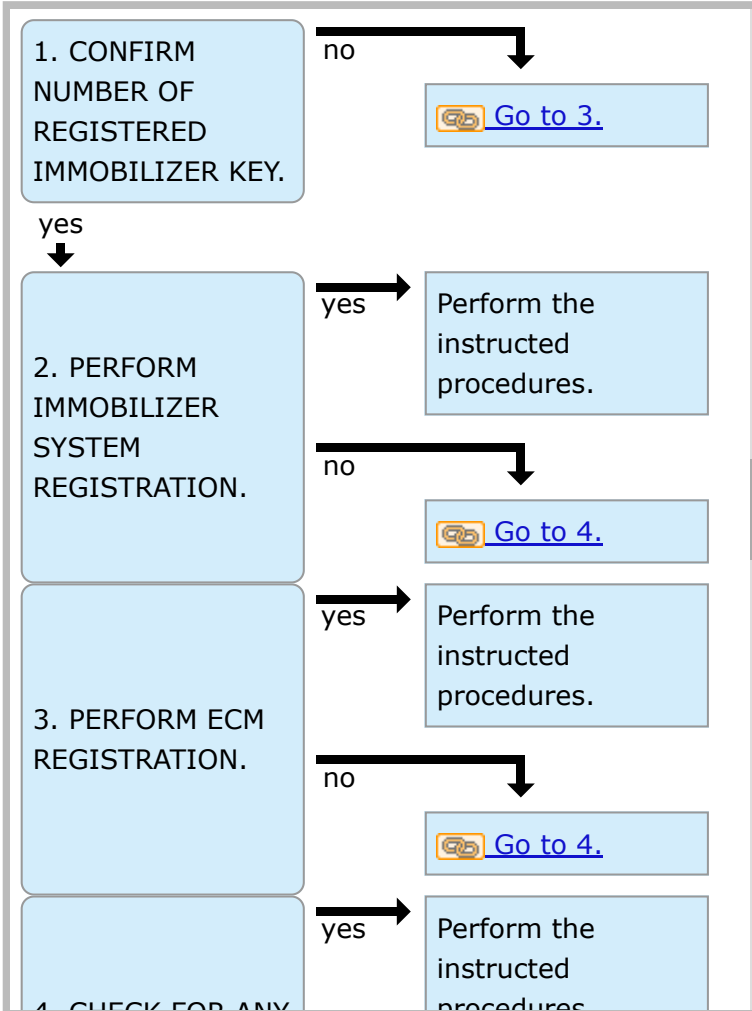
START

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1571 REFERENCE CODE INCOMPATIBILITY

CAUTION/NOTE

INTRO



Caution:

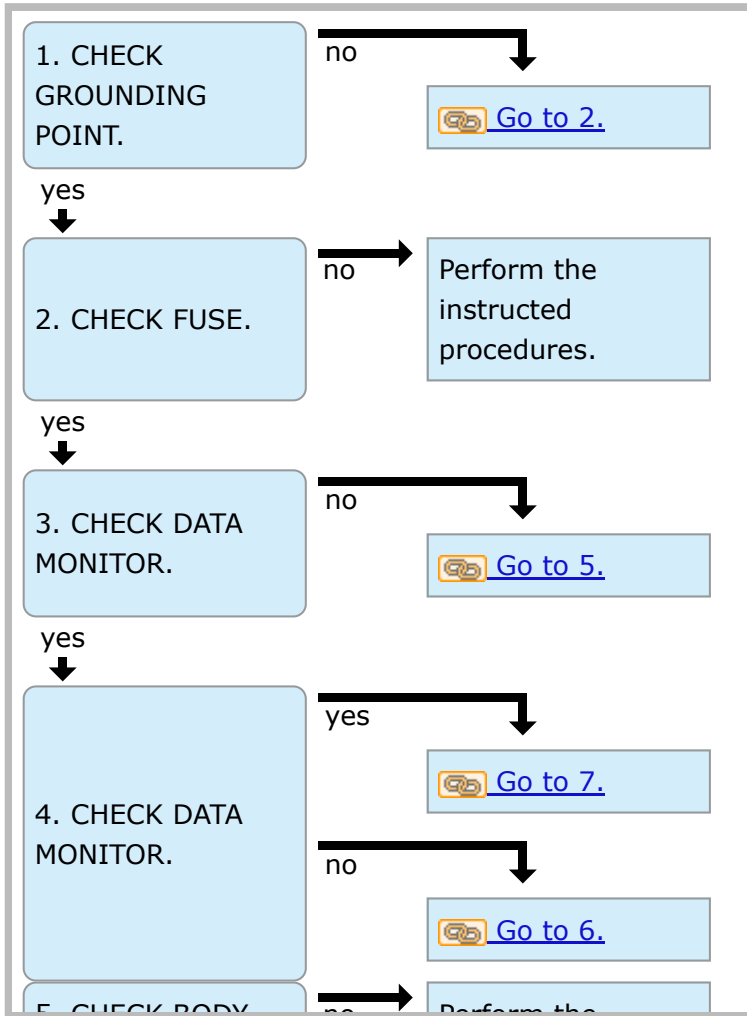
When the body integrated unit is re registration of the immobilizer system required. For details, refer to the "REGISTRATION MANUAL FOR IMM" provided as a separate volume.

START

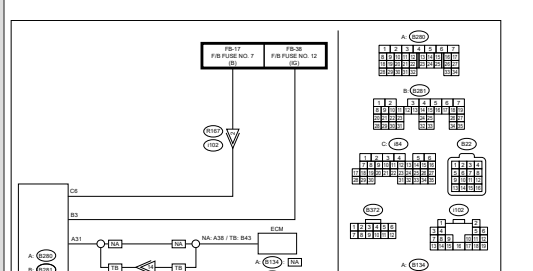
IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1572 IMM CIRCUIT EXCEPT ANTENNA CIRCUIT

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Immobilizer system [Ref. to WIRING SYSTEM>Immobilizer System>WIRING DIAG](#)



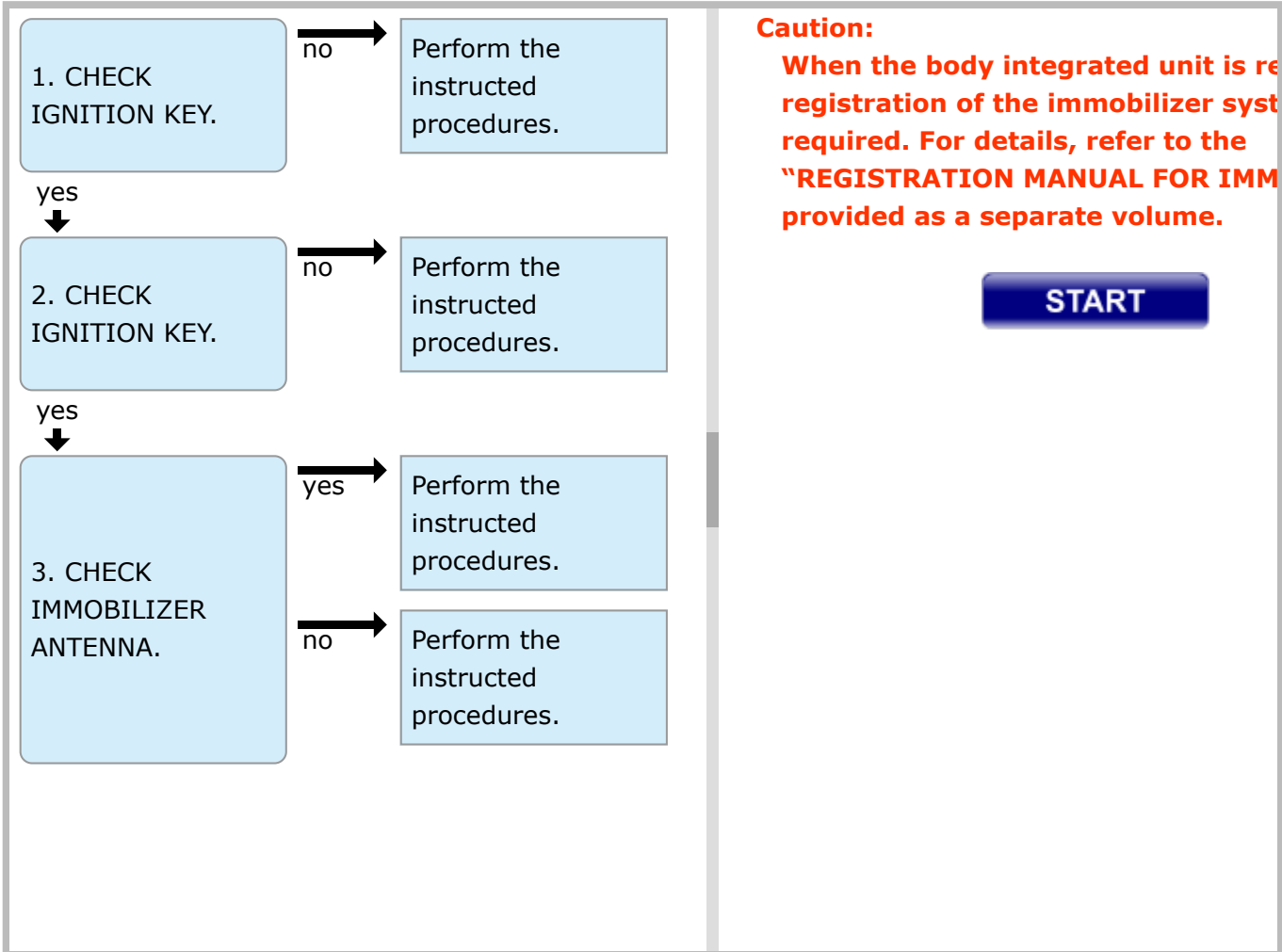
Caution:
 When the body integrated unit is re registration of the immobilizer system required. For details, refer to the "REGISTRATION MANUAL FOR IMM provided as a separate volume.

START

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1574 KEY COMMUNICATION

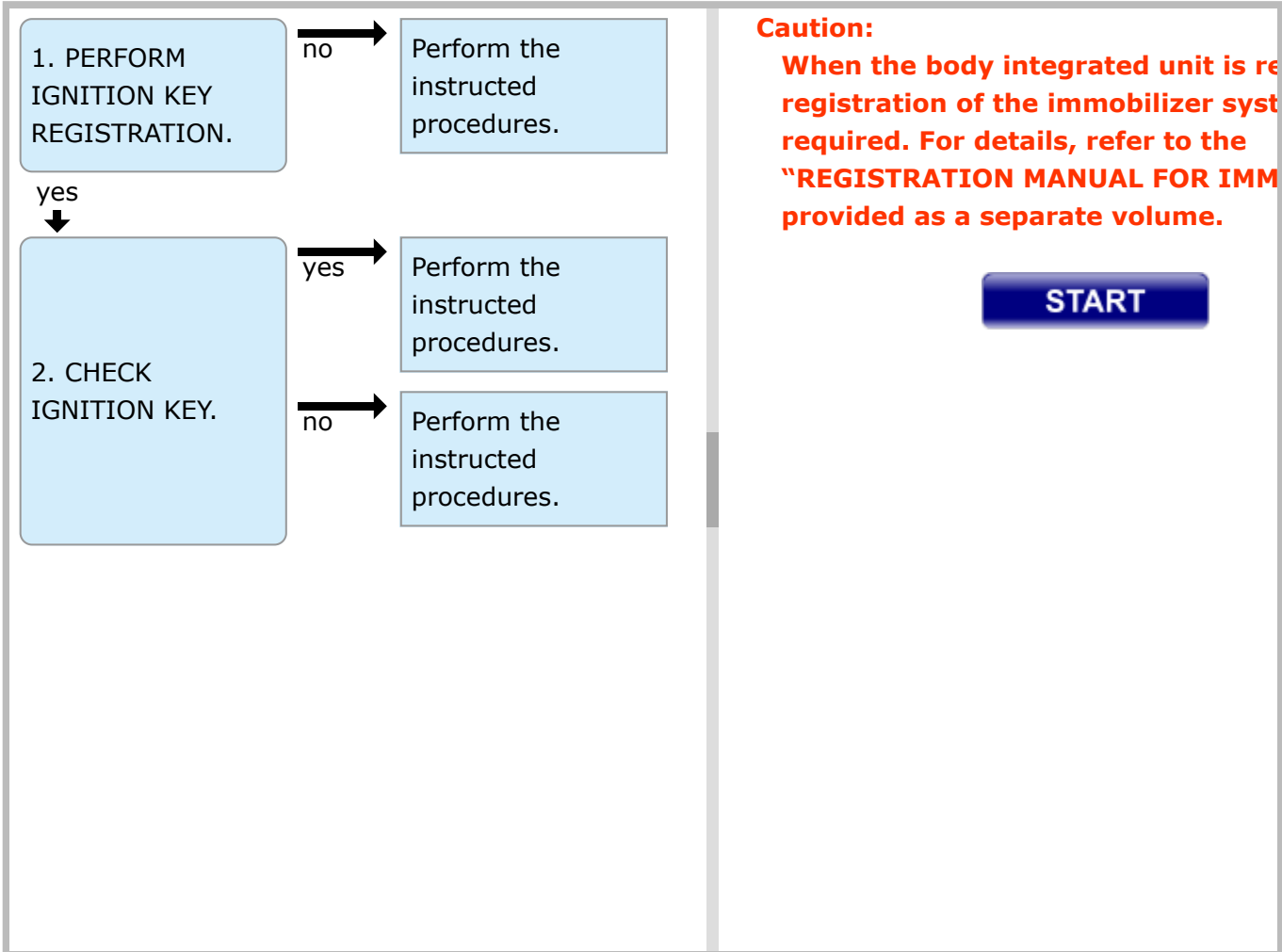
[CAUTION/NOTE](#) [INTRO](#)



IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1575 INCORRECT IMMOBILIZER KEY

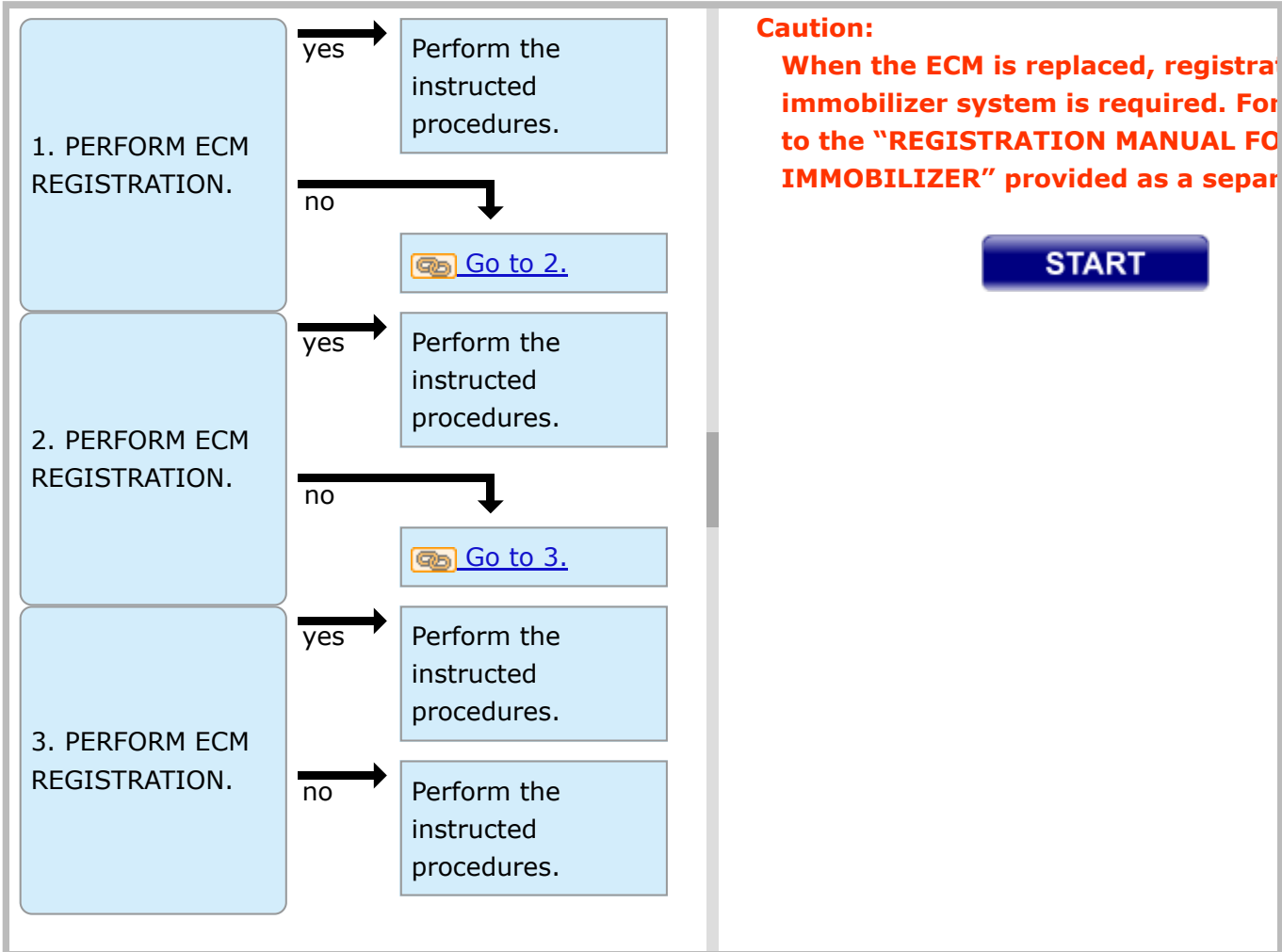
CAUTION/NOTE INTRO



IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1576 EGI CONTROL MODULE EEPROM

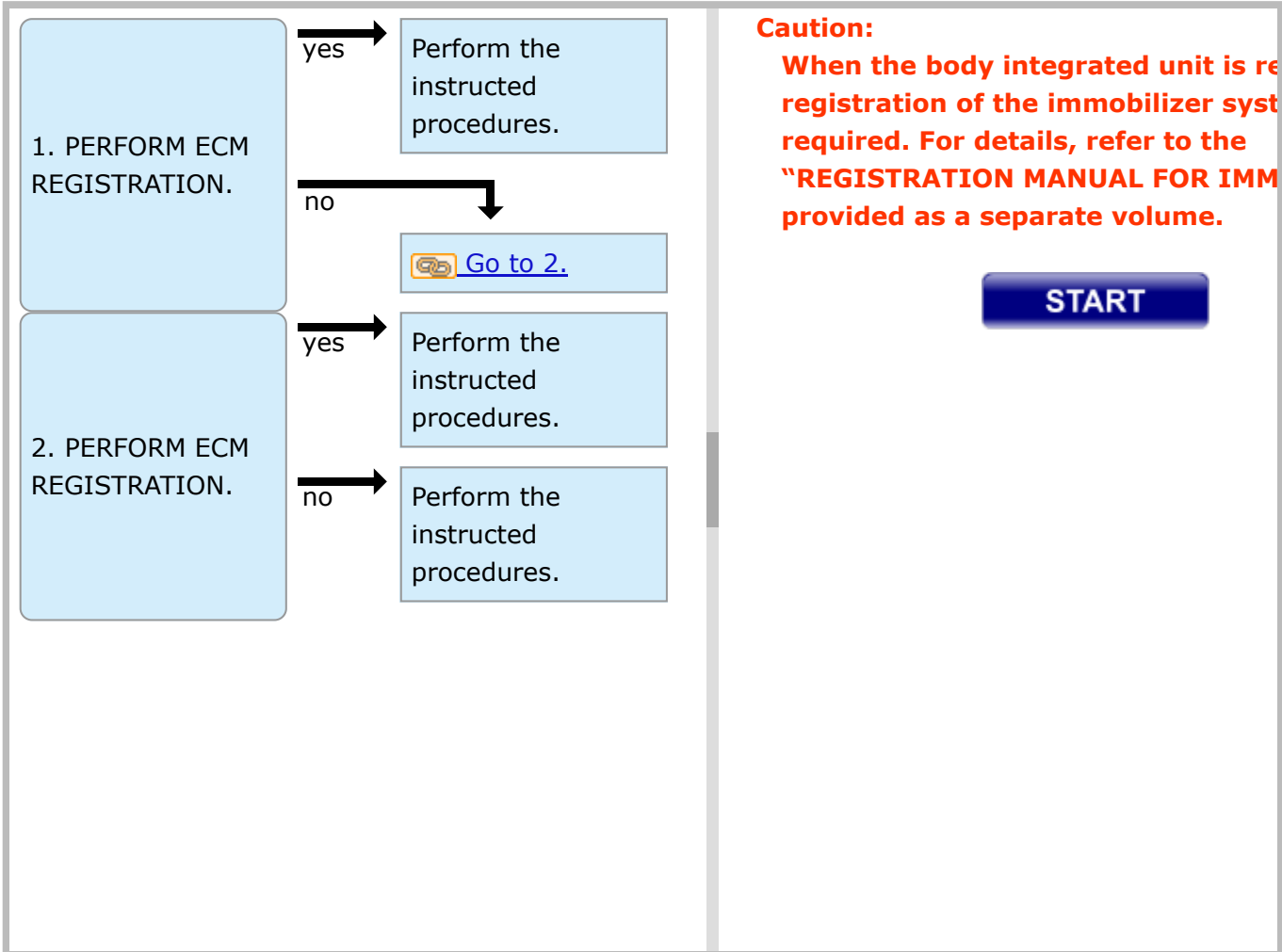
[CAUTION/NOTE](#) [INTRO](#)



IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1577 IMM CONTROL MODULE EEPROM

[CAUTION/NOTE](#) [INTRO](#)



IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1578 METER

DTC detecting condition:

- Except for C0 and C5 models
Reference code incompatibility between combination meter and body integrated unit or communication failure between body integrated unit and ECM
- For C0 and C5 models
Reference code incompatibility between security control module and body integrated unit or communication failure between body integrated unit and ECM

1. CHECK DTC.

Read the DTC of the body integrated unit. [🔗 Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1401, B1405, B1406, B1407, B1408 or B1409 displayed?

Yes

Perform the diagnosis for the displayed DTC B1401, B1405, B1406, B1407, B1408 or B1409. [🔗 Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1401 METER COLLATION.](#) [🔗 Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1405 SCU COLLATION.](#) [🔗 Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1406 SCU EEPROM.](#) [🔗 Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1407 MET COMMUNICATION.](#) [🔗 Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1408 METER NON-VOLATILE MEMORY.](#) [🔗 Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1409 SCU COMMUNICATION.](#)

No

Perform the diagnosis of DTC B1572. [🔗 Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1572 IMM CIRCUIT EXCEPT ANTENNA CIRCUIT.](#)

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- For detailed operation procedures, refer to "Application help".
- For details concerning DTC, refer to List of Diagnostic Trouble Code (DTC).  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

1. ECM

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Engine Control System], and then select [Enter].
5. On [Engine Control System] display, select [DTC].

2. BODY INTEGRATED UNIT

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Body Control], and then select [Enter].
5. On [Body Control] display, select [DTC].

IMMOBILIZER (DIAGNOSTICS) > Diagnostics Chart for Security Indicator Light

INSPECTION

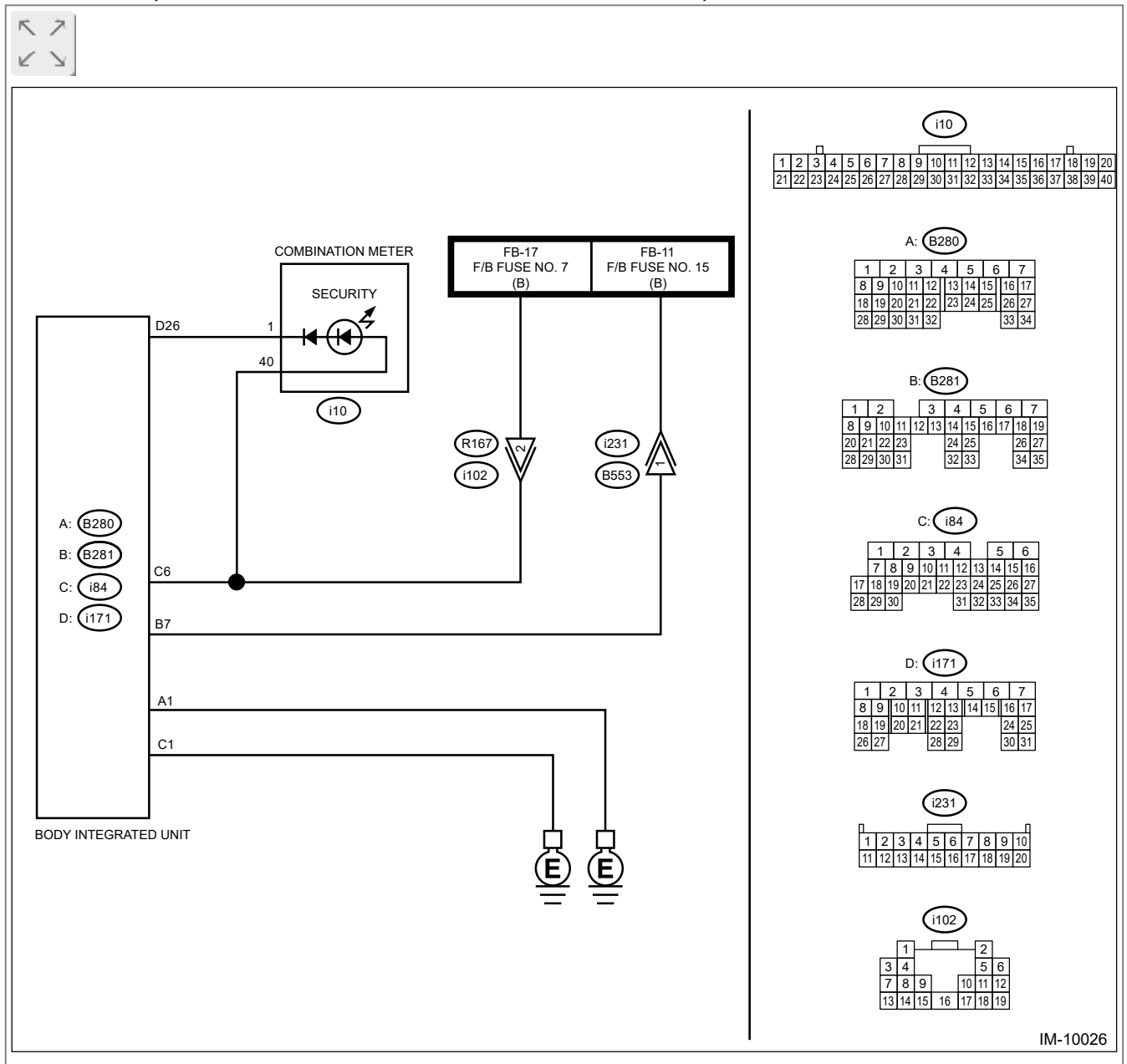
1. CHECK SECURITY INDICATOR LIGHT CIRCUIT

Caution:

When the body integrated unit is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Wiring diagram:

Immobilizer system  [Ref. to WIRING SYSTEM>Immobilizer System>WIRING DIAGRAM.](#)



IM-10026

1. CHECK FUSE.



1. Remove the ignition key from ignition switch. Or, turn off the power.
2. Check the fuse (F/B No. 7, No. 15).

Is the check result OK?

Yes

 [Go to 2.](#)

No

Replace the fuse. If the replaced fuse blows out easily, repair the short circuit in the harness between the fuse and body integrated unit.

2. CHECK SECURITY INDICATOR LIGHT.

1. Disconnect the connector from body integrated unit.
2. Connect the resistor (100 Ω) between the body integrated unit connector terminal (i171) No. 26 and chassis ground.

Does the security indicator light illuminate?

Yes

 [Go to 3.](#)

No

 [Go to 5.](#)

3. CHECK BODY INTEGRATED UNIT GROUND CIRCUIT (OPEN CIRCUIT).

Measure the resistance between the body integrated unit connector terminal and chassis ground.

Connector & terminal

(B280) No. 1 — Chassis ground:

(i84) No. 1 — Chassis ground:

Is the resistance less than 10 Ω ?

Yes

 [Go to 4.](#)

No

Repair the open circuit of the body integrated unit ground circuit.

4. CHECK BODY INTEGRATED UNIT POWER SUPPLY CIRCUIT.

Measure the voltage between the body integrated unit connector terminal and chassis ground.


Connector & terminal

(B281) No. 7 (+) — Chassis ground (—):

(i84) No. 6 (+) — Chassis ground (—):

Is the voltage 10 V or more?


Yes

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

No

Check the harness for open or short circuit between body integrated unit and fuse.

5. CHECK POWER SUPPLY CIRCUIT FOR COMBINATION METER.

1. Remove the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)


2. Measure the voltage between combination meter connector terminal and chassis ground.

Connector & terminal

(i10) No. 40 (+) — Chassis ground (—):

Is the voltage 10 V or more?

Yes

 [Go to 6.](#)

No

Check for an open or short circuit in the harness between the combination meter and fuse.

6. CHECK COMBINATION METER CIRCUIT (OPEN).


Measure the resistance between the body integrated unit connector terminal and combination meter connector terminal.

Connector & terminal

(i171) No. 26 — (i10) No. 1:

Is the resistance less than 10 Ω ?

Yes

LED bulb is defective. Replace the combination meter case assembly.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter>DISASSEMBLY.](#)

No

Repair the harness or connector.

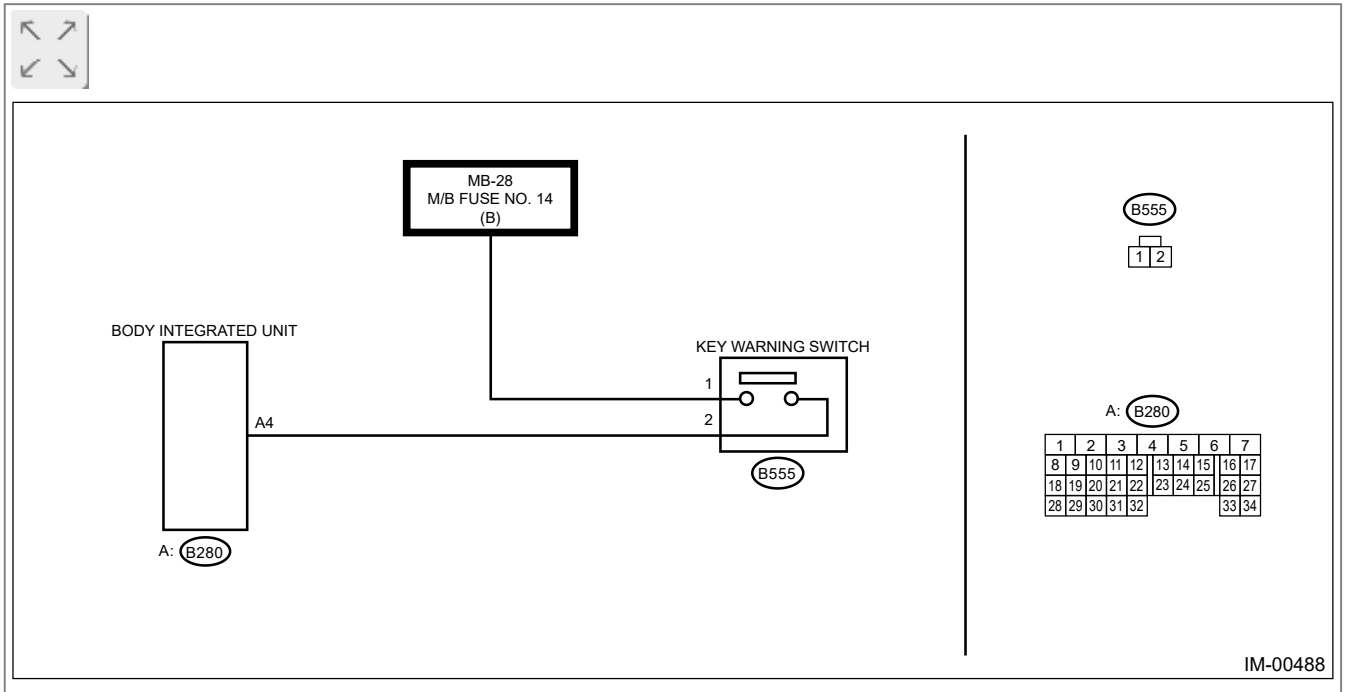
2. CHECK KEY SWITCH CIRCUIT

Caution:

When the body integrated unit is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Wiring diagram:

Immobilizer system  Ref. to WIRING SYSTEM>Immobilizer System>WIRING DIAGRAM.



IM-00488

1. CHECK POWER SUPPLY CIRCUIT.



1. Disconnect the connector from key warning switch.
2. Measure the voltage between key warning switch connector terminal and chassis ground.

Connector & terminal

(B555) No. 1 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 2.](#)

No

Check the fuse for the key warning switch and the power supply circuit.

2. CHECK KEY WARNING SWITCH.




1. Insert the ignition key in the ignition switch. (OFF or ACC)
2. Measure the resistance between key warning switch connector terminals.

Terminals


No. 1 — No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Replace the key warning switch.  [Ref. to SECURITY AND LOCKS>Key Lock Cylinders.](#)

3. CHECK KEY WARNING SWITCH.

1. Remove the ignition key from ignition switch.
2. Measure the resistance between key warning switch connector terminals.

Terminals


No. 1 — No. 2:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Replace the key warning switch.  [Ref. to SECURITY AND LOCKS>Key Lock Cylinders.](#)

4. CHECK HARNESS BETWEEN KEY WARNING SWITCH AND BODY INTEGRATED UNIT (OPEN).

1. Disconnect the connector from body integrated unit.
2. Measure the resistance between key warning switch connector terminal and body integrated unit connector terminal.

Connector & terminal

(B555) No. 2 — (B280) No. 4:

Is the resistance less than 10 Ω ?

Yes

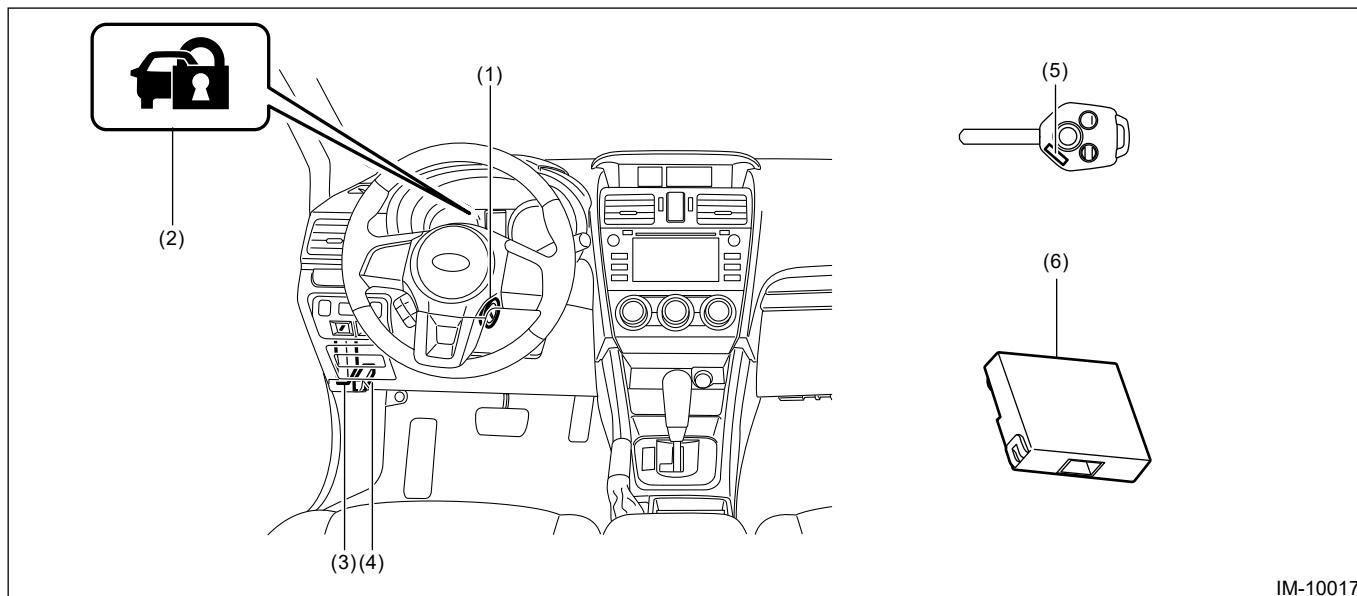
Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

No

Repair the harness between key warning switch and body integrated unit.

IMMOBILIZER (DIAGNOSTICS) > Electrical Component Location

LOCATION



IM-10017

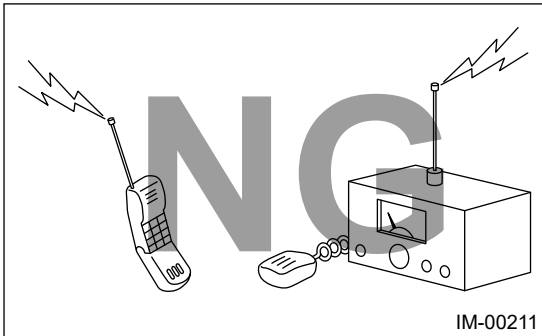
- | | | |
|---|--------------------------|---|
| (1) Antenna | (3) BODY INTEGRATED UNIT | (5) Transponder |
| (2) Security indicator light (LED bulb) | (4) Data link connector | (6) Security control module (for C0 and C5 models only) |

IMMOBILIZER (DIAGNOSTICS) > General Description

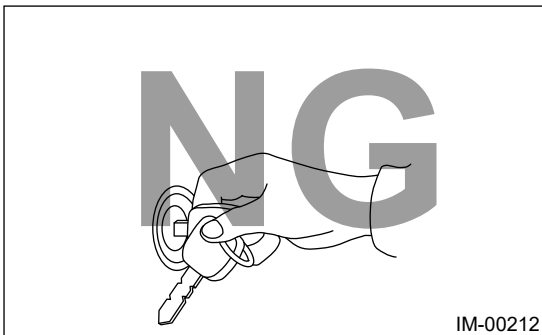
CAUTION

Caution:

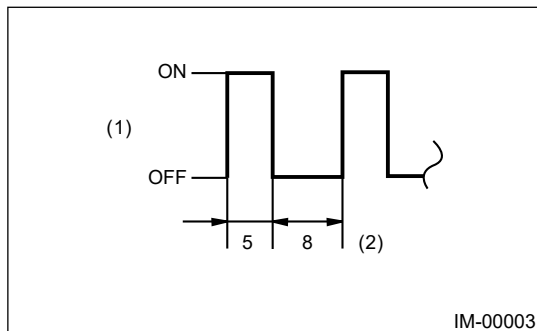
- Do not use the electrical test equipment on the airbag system wiring harnesses and connector circuits.
- Be careful not to damage the airbag system wiring harness.
- While diagnostic items are being checked, do not operate radios, portable telephones, etc. which emit electromagnetic waves near or inside the vehicle.



- When turning the ignition switch to ON or OFF while diagnostic items are being checked, do not allow keys with different ID codes close to the ignition switch. If the ignition key is on a key holder, remove it from the key holder before performing diagnoses.



- When repeatedly turning the ignition switch to ON or OFF while diagnostic items are being checked, it should be switched in cycles of "ON" for at least 5 seconds → "OFF" for at least 8 seconds.



(1) Ignition switch position


(2) Sec.

- **If the engine fails to start with a registered ignition key, detach the ignition key from ignition switch and wait for approx. 1 second until security indicator light begins to flash. And then start the engine again.**
- **Before performing the diagnostics, obtain all keys for the vehicle from the owner.**
- **Do not register a body integrated unit already registered to another vehicle to diagnose failures or inspect functions.**

IMMOBILIZER (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	— (Newly adopted tool)	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".


2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used for measuring resistance, voltage and current. Used together with Subaru Select Monitor 4.

IMMOBILIZER (DIAGNOSTICS) > Immobilizer Control Module I/O Signal

WIRING DIAGRAM

1. IMMOBILIZER

Refer to "Immobilizer System" in the wiring diagram.  [Ref. to WIRING SYSTEM>Immobilizer System>WIRING DIAGRAM.](#)









IMMOBILIZER (DIAGNOSTICS) > List of Diagnostic Trouble Code (DTC)

LIST

Note:






If DTCs irrelevant to the immobilizer are displayed, perform diagnosis according to the DTCs irrelevant to the immobilizer first.





1. ECM

DTC	Item	Content of diagnosis	Index No.
B157 0	ANTENNA	Faulty antenna	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1570 ANTENNA.
B157 1	REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM)	Reference code incompatibility between body integrated unit and ECM	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1571 REFERENCE CODE INCOMPATIBILITY.
B157 2	IMM CIRCUIT EXCEPT ANTENNA CIRCUIT	Communication failure between body integrated unit and ECM	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1572 IMM CIRCUIT EXCEPT ANTENNA CIRCUIT.
B157 4	KEY COMMUNICATION	Communication failure between key and body integrated unit	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1574 KEY COMMUNICATION.
B157 5	INCORRECT IMMOBILIZER KEY	Incorrect immobilizer key (use of unregistered key in body integrated unit)	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1575 INCORRECT IMMOBILIZER KEY.
B157 6	EGI CONTROL MODULE EEPROM	ECM malfunctioning	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1576 EGI CONTROL MODULE EEPROM.
B157 7	IMM CONTROL MODULE EEPROM	Body integrated unit malfunctioning	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1577 IMM CONTROL MODULE EEPROM.
B157 8	METER	<ul style="list-style-type: none"> Reference code incompatibility between 	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic

(Except for C0 and C5 models)	combination meter and body integrated unit	Procedure with Diagnostic Trouble Code (DTC)>DTC B1578 METER.
METER (C0 and C5 models)	<ul style="list-style-type: none"> • Communication failure between body integrated unit and ECM • Reference code incompatibility between body integrated unit and security control module • Communication failure between body integrated unit and ECM 	

2. BODY INTEGRATED UNIT

DTC	Item	Content of diagnosis	Index No.	Relation between ECM and DTC
B140 1	METER COLLATION	Reference code incompatibility between combination meter and body integrated unit	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1401 METER COLLATION.	B1578
B140 2	IMMOBILIZER KEY COLLATION	<ul style="list-style-type: none"> • Incorrect immobilizer key (use of unregistered key in body integrated unit) • Faulty antenna • Communication failure between key and body integrated unit 	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1402 IMMOBILIZER KEY COLLATION.	<ul style="list-style-type: none"> • B1575 • B1570 • B1574
B140 5	SCU COLLATION	Reference code incompatibility between body integrated unit and security control module	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1405 SCU COLLATION.	B1578
B140 6	SCU_EEPROM	Defective security control module	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1406 SCU EEPROM.	B1578
B140 7	MET COMMUNICATION	Communication failure between body integrated unit and combination meter	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic	B1578

			Trouble Code (DTC)>DTC B1407 MET COMMUNICATION.	
B1408	METER NON-VOLATILE MEMORY	Defective combination meter	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1408 METER NON-VOLATILE MEMORY.	B1578
B1409	SCU COMMUNICATION	Communication failure between body integrated unit and security control module	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1409 SCU COMMUNICATION.	B1578
B1410	TRANSPONDER COMMUNICATION	Communication failure between key and body integrated unit	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1410 TRANSPONDER COMMUNICATION.	B1574
B1411	IMMOBILIZER ANTENNA	Faulty antenna	 Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1411 IMMOBILIZER ANTENNA.	B1570

Note:

The starter relay control is performed in immobilizer system. When the body integrated unit detects a nonconformity of reference code, it immediately outputs a starter relay cut signal to ECM, and then ECM stops the starter relay operation. In this case, engine does not start, and DTC is not recorded in ECM. Therefore, check DTC on the body integrated unit to identify the cause of the engine not starting.


IMMOBILIZER (DIAGNOSTICS) > Subaru Select Monitor

OPERATION


1. HOW TO USE SUBARU SELECT MONITOR

For detailed operation procedures, refer to "Application help".

2. READ DIAGNOSTIC TROUBLE CODE (DTC) FOR ENGINE AND BODY INTEGRATED UNIT

Refer to "Diagnostic Trouble Code (DTC)" for information about how to indicate DTC.  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Note:

If a problem is detected, repair the trouble cause.  [Ref. to IMMOBILIZER \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1572 IMM CIRCUIT EXCEPT ANTENNA CIRCUIT.](#)

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Active Test

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Keyless Access with Push Button Start], and then select [Enter].
5. On [Select Function] display, select [Active Test].
6. Select a location to be inspected.

Note:

Each output check continues to run for five seconds before stopping automatically.

Data	Keyless access CM output check	Remarks
Tuner power supply ON (indoor tuner)	Output	Perform the power supply check for the receiver.
	Stop	
Driver's external transmitter	Output	Perform the output check for the driver's side door outside antenna.
	Stop	
Passenger's external transmitter	Output	Perform the output check for the passenger's side door outside antenna.
	Stop	
STSW	Output	Turn on the STSW.* 2
	Stop	
IGN2	Output	Turn on the IGN2.
	Stop	
IGN1	Output	Turn on the IGN1.
	Stop	
ACC	Output	Turn on the ACC.
	Stop	
Start SW character illumination lighted	Output	Perform ON output of the push button ignition switch back-up light.* 1
	Stop	
Start SW indicator lighted (green)	Output	Perform ON output of the push button ignition switch back-up light.* 1
	Stop	
Start SW indicator lighted (orange)	Output	Perform ON output of the push button ignition switch back-up light.* 1
	Stop	
Steering lock power supply	Output	Output power supply signal from power supply CM to steering lock CM.
	Stop	

*1: When lit by a condition other than for a system operation check mode, it will not become unlit even when set to either OFF or no output.

*2: When performed with IGN ON, engine will start. Therefore, great care must be exercised.

Note:

For detailed operation procedures, refer to "Application help".


KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Basic Diagnostic Procedure

PROCEDURE

Caution:

- **Subaru Select Monitor kit is required for reading DTC, performing diagnosis and reading data monitor.**
- **Before removal or installation, be sure to remove any foreign matter (dust, moisture, oil, etc.).**
- **Registration of immobilizer may be needed after the replacement of control modules, etc. For detailed procedure, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**


Note:


- **Using the Function Setting (Customize), check that the keyless access with push button start is not in a canceled state.  [Ref. to SECURITY AND LOCKS>Function Setting \(Customize\)>OPERATION.](#)**
- **Interview for keyless access with push button start**

1. CHECK BATTERY.


Using a tester, measure the battery voltage.

Is the voltage 11 V or more?

 [Go to 2.](#)

Charge or replace the battery and perform check pre-inspection.  [Go to 2.](#)

2. CHECK PRE-INSPECTION.


Use the interview check list to interview the user.  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Check List for Interview.](#)

Was the symptoms of the trouble recorded in the interview?

 [Go to 3.](#)

Interview the user again.

3. BASIC INSPECTION.

Check the DTC in LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>General Description>INSPECTION.](#)

Is the check result OK?


Yes

 [Go to 4.](#)


No

Repair or replace it according to DTC of LAN system.

4. CHECK TROUBLE SYMPTOM.


1. Read DTCs for the keyless access system.  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Note:

If the communication function of the Subaru Select Monitor cannot be executed properly, check the communication circuit.  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Subaru Select Monitor>COMMUNICATION FOR INITIALIZING IMPOSSIBLE.](#)


2. Record all DTCs, time stamp and freeze frame data.

Note:

For time stamp, refer to "LAN SYSTEM".  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>General Description>CAUTION > TIME STAMP.](#)

Are any DTCs displayed?


Yes

Perform the diagnosis for the displayed DTCs. After diagnosis,  [Go to 7.](#)

No

 [Go to 5.](#)

5. CHECK PHENOMENON LIST.

Check the "Phenomenon List".  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>General Diagnostic Table.](#)

Is there a symptom that corresponds in the phenomenon list?

Yes



Perform diagnosis according to the procedures in the phenomenon list.

No

 [Go to 6.](#)

6. CHECK TROUBLE PHENOMENON.



1. Check data monitor.  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Data Monitor.](#)
2. Perform a function check.  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>General Description>CAUTION > KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM.](#)
3. Perform a unit check.

Was the trouble cause found?

Yes



Repair the cause of trouble.

No

Repeat a basic check again.

7. PERFORM DIAGNOSIS.



1. Clear the memory.  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Clear memory.](#)
2. Perform the Inspection Mode.  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Data Monitor.](#)

Are any DTCs displayed?

Yes

Perform the diagnosis for the displayed DTCs.

No

Finish the diagnosis.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Check List for Interview

CHECK

Inspect the following items regarding the vehicle’s state.



Keyless Access with Push Button Start System Trouble Check List for Interview Received Year Month Date			
Customer’s name		Registration No.	Initial year of registration Year Month Date
		Vehicle model	Frame number
Interviewer	Inspector	Engine type	Odometer reading
Customer specified content			
Date and time when the trouble occurred		Frequency of trouble occurrence	
Condition of trouble occurrence		Weather	
Road conditions		Occurrence location	
Accessory installation condition			
Trouble condition			
<input type="checkbox"/> DTC		<input type="checkbox"/> ()	
<input type="checkbox"/> Immobilizer system	Engine does not start	<input type="checkbox"/> The starter does not turn <input type="checkbox"/> Starter operates but engine does not start <input type="checkbox"/> Engine starts but stops immediately	
	Does not start with remote engine starter		
<input type="checkbox"/> Steering lock system	The steering lock is not released		
	The steering lock does not lock		
<input type="checkbox"/> Keyless access system	Cannot lock/unlock using the touch sensor (lock), touch sensor (unlock), rear gate opener button and rear lock button		
	Cannot lock with the touch sensor (lock) Cannot unlock with the touch sensor (unlock) Cannot lock nor unlock with the touch sensor (lock), touch sensor (unlock)	<input type="checkbox"/> Driver’s side door <input type="checkbox"/> Passenger’s side door <input type="checkbox"/> Rear gate door	

	Rear gate can not be locked with the rear lock button	
	Cannot unlock with the rear gate opener button	
	The access key lockout prevention feature does not function	<input type="checkbox"/> INDOOR <input type="checkbox"/> Luggage room
	The LED does not illuminate when the access key button is pressed	
	The external buzzer does not beep	
	The passenger room buzzer does not sound	
<input type="checkbox"/> Other	The room light or map light does not illuminate ()	

Note:

- **Perform the diagnostics according to the basic diagnostic procedure.**
- **If the room light or map light does not illuminate and the keyless access with push button start does not function, the back-up fuse may be loose or blown.**

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Clear memory

OPERATION

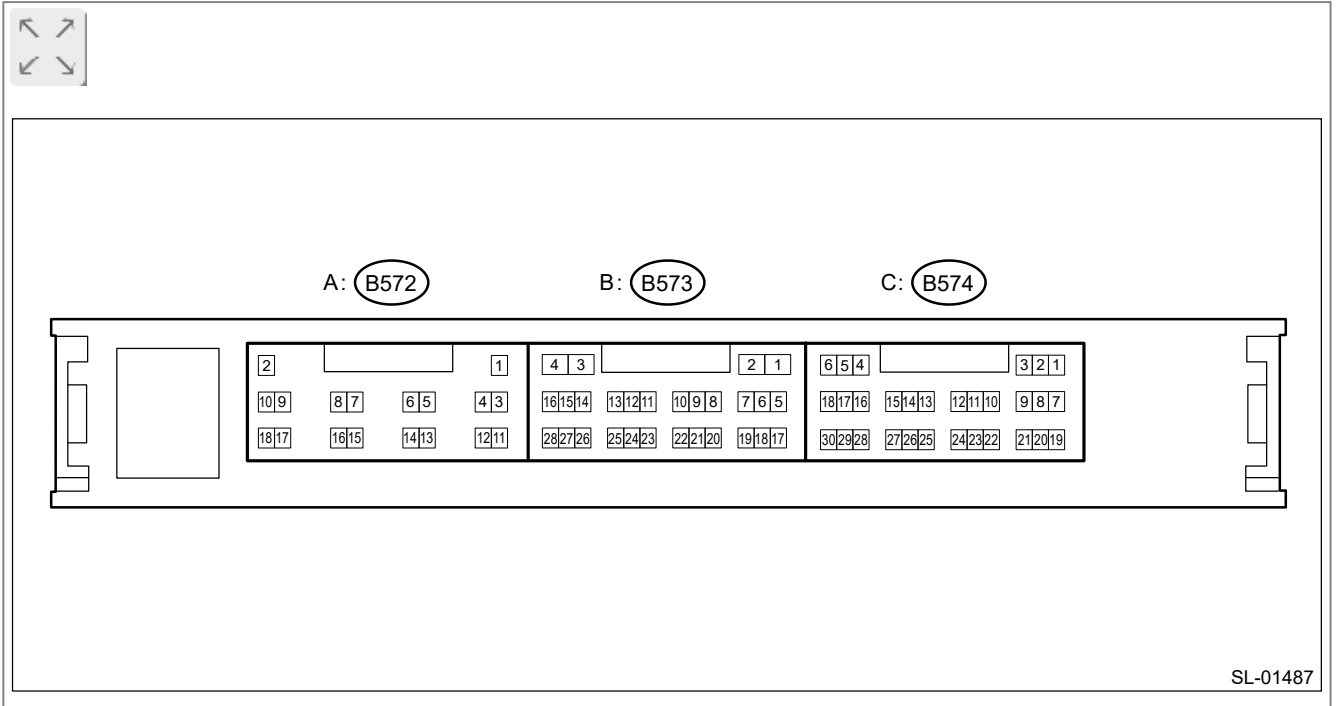
- 1.** On [Start] display, select [Diagnosis].
- 2.** On [Vehicle selection] display, input the target vehicle information and select [OK].
- 3.** On [Main Menu] display, select [Each System].
- 4.** On [Select System] display, select [Keyless Access with Push Button Start], and then select [Enter].
- 5.** On [Select Function] display, select [DTC].
- 6.** On [DTC] display, select [Clear memory].

Note:

- **For detailed operation procedures, refer to “Application help”.**
- **Initial diagnosis of electronic throttle control is performed after memory clearance. Wait for 10 seconds or more after turning the ignition switch to ON, and then start the engine.**

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Control Module I/O Signal
ELECTRICAL SPECIFICATION

1. KEYLESS ACCESS CM



SL-01487

Terminal No.	Terminal symbol	Content
(B572) No. 2	+B	+B
(B572) No. 3	INDS	Start switch indicator (green) output
(B572) No. 5	N-SW	Neutral switch input
(B572) No. 7	STSW	STSW output
(B572) No. 9	IG2D	IG2 relay drive output
(B572) No. 10	CLUT	Clutch switch input
(B572) No. 11	GND	GND
(B572) No. 13	EGIO	Immobilizer communication 1
(B572) No. 17	TACH	Engine speed input
(B572) No. 18	STP1	Stop light switch input
(B573) No. 1	CG8B	Outside rear antenna output -
(B573) No. 2	CLG8	Outside rear antenna output +
(B573) No. 5	RCO	Tuner power supply
(B573) No. 8	CG7B	Inside rear antenna output -
(B573) No. 9	CLG7	Inside rear antenna output +
(B573) No. 10	CG6B	Inside center antenna output -
(B573) No. 11	CLG6	Inside center antenna output +
(B573) No. 15	IDW	ID code box presence judgment terminal
(B573) No. 17	RDA	Tuner reception data input

(B573) No. 19	KSS1	tuner reception start signal input
(B573) No. 27	TSW5	Rear gate lock request switch input
(B573) No. 28	ACCR	ACC cutoff input
(B574) No. 1	VC5	Immobilizer amplifier power supply (start switch)
(B574) No. 2	CG5B	Inside front antenna output –
(B574) No. 3	CLG5	Inside front antenna output +
(B574) No. 4	ACCD	ACC relay drive output
(B574) No. 5	IG	IGN power supply
(B574) No. 6	IG1D	IG1 relay drive output
(B574) No. 7	CODE	Immobilizer signal reception (start switch)
(B574) No. 8	TSW2	Passenger's lock sensor signal input
(B574) No. 9	TXCT	Immobilizer signal transmission (start switch)
(B574) No. 10	CG2B	Passenger's antenna output –
(B574) No. 11	CLG2	Passenger's antenna output +
(B574) No. 12	CLG1	Driver's antenna output +
(B574) No. 13	CG1B	Driver's antenna output –
(B574) No. 14	CANH	HS-CAN H
(B574) No. 15	CANL	HS-CAN L
(B574) No. 16	SWIL	Start switch character illumination output
(B574) No. 17	LIN	LIN communication
(B574) No. 18	INDW	Start switch indicator (orange) output
(B574) No. 19	POS1	Driver's sensor drive power supply
(B574) No. 20	TSW1	Driver's lock sensor signal input
(B574) No. 21	POS2	Passenger's sensor drive power supply
(B574) No. 22	SEN1	Driver's unlock sensor signal input
(B574) No. 23	SEN2	Passenger's unlock sensor signal input
(B574) No. 24	AGND	Immobilizer amplifier GND (start switch)
(B574) No. 25	P	Parking position switch input
(B574) No. 26	SLP	Steering lock position input
(B574) No. 27	SPD	Vehicle speed signal input
(B574) No. 28	SSW1	Start switch input 1
(B574) No. 29	SLR+	Steering motor power supply signal output
(B574) No. 30	SSW2	Start switch input 2

Disconnect the control module connector (B572) before checking the following items.

Note:

If the measured value is out of standard, it is possible that the vehicle has a fault.

Terminal No.	Item	Measuring condition	Standard
(B572) No. 2 (+B) ↔ (B572) No. 11 (GND)	Voltage	Always	9.5 – 16 V
(B572) No. 11 (GND) ↔ Chassis around	Resistance	Always	Less than 1 Ω

Disconnect the control module connector (B573) before checking the following items.

Note:

If the measured value is out of standard, it is possible that the vehicle has a fault.

Terminal No.	Item	Measuring condition	Standard
(B573) No. 15 (IDW) ↔ Chassis ground (For C0 and C5 model only)	Continuity	Always	Continuity exists

Disconnect the control module connectors (B574) and (B572) before checking the following items.

Note:

If the measured value is out of standard, it is possible that the vehicle has a fault.

Terminal No.	Item	Measuring condition	Standard
(B574) No. 4 (ACCD) ↔ Chassis ground	Resistance	Always (20°C)	152.61 – 216.5 Ω
(B572) No. 9 (IG2D) ↔ Chassis ground	Resistance	Always (20°C)	74.15 – 460.88 Ω
(B574) No. 6 (IG1D) ↔ Chassis ground	Resistance	Always (20°C)	50.87 – 72.17 Ω
(B572) No. 18 (STP1) ↔ Chassis ground (AT model only)	Voltage	Brake pedal depressed → released	11 – 14 V → 1 V or less
(B574) No. 25 (P) ↔ Chassis ground (AT model only)	Resistance	Except for shift positions P → Shift position P	40 kΩ or more → 200 Ω or less
(B574) No. 27 (SPD) ↔ Chassis ground	Resistance	Always	30 kΩ or more
(B574) No. 28 (SSW1) ↔ Chassis ground	Resistance	Push button ignition switch pressed → released	Less than 1 Ω → 10 kΩ or more
(B574) No. 29 (SLR+) ↔ Chassis ground	Resistance	Always	10 kΩ or more
(B574) No. 30 (SSW2) ↔ Chassis ground	Resistance	Push button ignition switch pressed → released	Less than 1 Ω → 10 kΩ or more
(B574) No. 17 (LIN) ↔ Chassis ground	Continuity	Always	Continuity does not exist
(B574) No. 14 (CANH) ↔ Chassis ground	Pulse	Power OFF, and open/close the door	Pulse generation

(B574) No. 15 (CANL) ↔ Chassis ground	Pulse	Power OFF, and open/close the door	Pulse generation
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Connect the control module connector before checking the following items.

Note:

If the measured value is out of standard, it is possible that the keyless access CM has a fault.

Terminal No.	Item	Measuring condition	Standard
(B574) No. 1 (VC5) ↔ (B574) No. 24 (AGND)	Voltage	30 seconds or more have passed after the door was opened or closed with IG OFF and the brake pedal (AT model) or clutch pedal (MT model) released.	1 V or less
	Waveform	Within 30 seconds after the push button ignition switch is pressed with IG OFF and access key not in the passenger room	Waveform 1
(B574) No. 2 (CG5B) ↔ (B572) No. 11 (GND)	Pulse	All doors closed, ACC and IG OFF, access key not in passenger room, touch sensor (lock) OFF → ON	No pulse output → Pulse output detected
(B574) No. 3 (CLG5) ↔ (B572) No. 11 (GND)	Pulse	All doors closed, ACC and IG OFF, access key not in passenger room, touch sensor (lock) OFF → ON	No pulse output → Pulse output detected
(B574) No. 4 (ACCD) ↔ (B572) No. 11 (GND)	Voltage	IG OFF → ACC ON	1 V or less → 9 – 14 V
(B574) No. 6 (IG1D) ↔ (B572) No. 11 (GND)	Voltage	ACC ON → IG ON	1 V or less → 9 – 14 V
(B574) No. 7 (CODE) ↔ (B574) No. 24 (AGND)	Voltage	30 seconds or more have passed after the door was opened or closed with IG OFF and the brake pedal (AT model) or clutch pedal (MT model) released.	1 V or less
	Waveform	Turn the ignition switch to OFF and with the access key near the push button ignition switch, press the push button ignition switch. *1	Waveform 2
(B574) No. 9 (TXCT) ↔ (B574) No. 24 (AGND)	Voltage	30 seconds or more have passed after the door was opened or closed with IG OFF and the brake pedal (AT model) or clutch pedal (MT model) released.	1 V or less
	Waveform	Turn the ignition switch to OFF and with the access key near the push button ignition switch, press the push button ignition switch. *1	Waveform 3
(B574) No. 10 (CG2B) ↔ (B572) No. 11 (GND)	Pulse	ACC and IG OFF, all doors closed, all doors locked by lock operation with wireless remote control, access key	No pulse output → Pulse output detected

		not in passenger room	
(B574) No. 11 (CLG2) ↔ (B572) No. 11 (GND)	Pulse	ACC and IG OFF, all doors closed, all doors locked by lock operation with wireless remote control, access key not in passenger room	No pulse output → Pulse output detected
(B574) No. 12 (CLG1) ↔ (B572) No. 11 (GND)	Pulse	ACC and IG OFF, all doors closed, all doors locked by lock operation with wireless remote control, access key not in passenger room	No pulse output → Pulse output detected
(B574) No. 13 (CG1B) ↔ (B572) No. 11 (GND)	Pulse	ACC and IG OFF, all doors closed, all doors locked by lock operation with wireless remote control, access key not in passenger room	No pulse output → Pulse output detected
(B574) No. 19 (POS1) ↔ (B572) No. 11 (GND)	Voltage	ACC and IG OFF → ACC or IG ON	9 – 14 V → less than 2 V
(B574) No. 21 (POS2) ↔ (B572) No. 11 (GND)	Voltage	ACC and IG OFF → ACC or IG ON	9 – 14 V → less than 2 V
(B574) No. 24 (AGND) ↔ Chassis ground	Resistance	Always	Less than 1 Ω
(B574) No. 25 (P) ↔ (B572) No. 11 (GND) (AT model only)	Voltage	Except for shift positions P → Shift position P	9 – 14 V or more → 1.5 V or less
(B574) No. 26 (SLP) ↔ (B572) No. 11 (GND)	Voltage	With ignition switch OFF and shift position P, Steering lock → Steering unlock	11 – 14 V → 1.2 V or less
(B574) No. 27 (SPD) ↔ Chassis ground	Pulse	Driving at approx. 5 km/h (3 MPH)	Pulse generation according to vehicle speed (approx. 5 km/h (3MPH): 3.54 Hz)
(B574) No. 28 (SSW1) ↔ (B572) No. 11 (GND)	Voltage	Push button ignition switch released → pressed	11 – 14 V → 1 V or less
(B574) No. 29 (SLR+) ↔ (B572) No. 11 (GND)	Voltage	When the following conditions are met, the doors are closed → opened, and steering lock motor is driven <ul style="list-style-type: none"> • Steering lock is unlocked • IG OFF • Shift position P 	11 – 14 V (Steering lock motor is stopped) → 1 V or less (Steering lock motor is driven)
(B574) No. 30 (SSW2) ↔ (B572) No. 11 (GND)	Voltage	Push button ignition switch released → pressed	11 – 14 V → 1 V or less
(B573) No. 1 (CG8B) ↔ (B572) No. 11 (GND)	Pulse	ACC and IG OFF, all doors closed, all doors locked, trunk or rear gate opener button OFF → ON	No pulse output → Pulse output detected
(B573) No. 2 (CLG8) ↔ (B572) No. 11 (GND)	Pulse	ACC and IG OFF, all doors closed, all doors locked, trunk or rear gate opener button OFF → ON	No pulse output → Pulse output detected

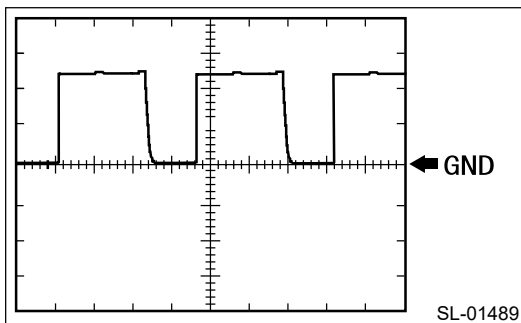
(B573) No. 5 (RCO) ↔ (B572) No. 11 (GND)	Voltage	ACC and IG OFF, access key is locked or unlock switch OFF → ON	1 V or less → 4.5 – 5.5 V
(B573) No. 8 (CG7B) ↔ (B572) No. 11 (GND)	Pulse	All doors closed, ACC and IG OFF, access key not in passenger room, touch sensor (lock) OFF → ON	No pulse output → Pulse output detected
(B573) No. 9 (CLG7) ↔ (B572) No. 11 (GND)	Pulse	All doors closed, ACC and IG OFF, access key not in passenger room, touch sensor (lock) OFF → ON	No pulse output → Pulse output detected
(B573) No. 19 (RSSI) ↔ (B572) No. 11 (GND)	Voltage	All doors closed, all doors locked, access key is locked or unlock switch OFF → ON	11 – 14 V → 2 V or less
(B573) No. 27 (TSW5) ↔ (B572) No. 11 (GND)	Pulse/voltage	ACC and IG OFF, all doors locked, trunk or rear gate lock button OFF → ON	9 V or more → less than 2 V
(B572) No. 9 (IG2D) ↔ (B572) No. 11 (GND)	Voltage	ACC ON → IG ON	1 V or less → 9 – 14 V
(B572) No. 13 (EGIO) ↔ (B572) No. 11 (GND)	Voltage/pulse	IG ON	11 to 14 V → pulse generates temporarily (waveform 4)
(B574) No. 8 (TSW2) ↔ (B572) No. 11 (GND)	Voltage	ACC and IG OFF, all doors closed, all doors locked, access key carried, passenger's seat touch sensor (lock) OFF → ON	9 V or more → less than 2 V (→ 9 V or more)
(B574) No. 18 (TSW1) ↔ (B572) No. 11 (GND)	Voltage	ACC and IG OFF, all doors closed, all doors locked, access key carried, driver's seat touch sensor (lock) OFF → ON	9 V or more → less than 2 V (→ 9 V or more)
(B574) No. 23 (SEN2) ↔ (B572) No. 11 (GND)	Voltage	ACC and IG OFF, all doors closed, all doors locked, access key carried, passenger's seat touch sensor (unlock) OFF → ON	9 V or more → less than 2 V (→ 9 V or more)
(B574) No. 22 (SEN1) ↔ (B572) No. 11 (GND)	Voltage	ACC and IG OFF, all doors closed, all doors locked, access key carried, driver's seat touch sensor (unlock) OFF → ON	9 V or more → less than 2 V (→ 9 V or more)
(B574) No. 16 (SWIL) ↔ (B572) No. 11 (GND)	Voltage	When illumination of start switch goes off, the headlight is OFF → ON, after setting the illumination control to MAX	Less than 2 V → 9 V or more
(B574) No. 17 (TACH) ↔ Chassis ground	Waveform	While engine idling	Pulse generation (waveform 5)
(B573) No. 28 (ACCR) ↔ (B572) No. 11 (GND)	Voltage	When brake pedal (AT model) or clutch pedal (MT model) depressed, push button ignition switch pressed (while cranking) → Except when	Less than 2 V → 9 V or more

		cranking	
(B572) No. 5 (N-SW) ↔ (B572) No. 11 (GND) (AT model only)	Voltage	Shift position N → other than P or N	Less than 2 V → 9 V or more
(B573) No. 10 (CG6B) ↔ (B572) No. 11 (GND)	Pulse	All doors closed, ACC and IG OFF, access key not in passenger room, touch sensor (lock) OFF → ON	No pulse output → Pulse output detected
(B573) No. 11 (CLG6) ↔ (B572) No. 11 (GND)	Pulse	All doors closed, ACC and IG OFF, access key not in passenger room, touch sensor (lock) OFF → ON	No pulse output → Pulse output detected
(B572) No. 17 (RDA) ↔ (B572) No. 11 (GND)	Pulse	All doors closed, all doors locked, access key is locked or unlock switch OFF → ON	2 V or less → 11 – 14 V → 2 V or less
(B572) No. 7 (STSW) ↔ (B572) No. 11 (GND)	Voltage	Shift lever is in position P or position N and access key is in passenger room. While depressing the brake pedal (AT model) or clutch pedal (MT model), press the push button ignition switch. (Engine start)	Less than 2 V → 9 V or more
(B572) No. 3 (INDS) ↔ (B572) No. 11 (GND)	Voltage	Depress the brake pedal (AT model) or clutch pedal (MT model).	9 V or more
(B574) No. 18 (INDW) ↔ (B572) No. 11 (GND)	Voltage	With ACC ON or IG ON, brake pedal (AT model) or clutch pedal (MT model) not depressed.	9 V or more

Note:

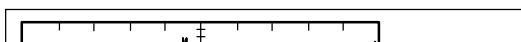
***1: Remove the access key battery before checking.**

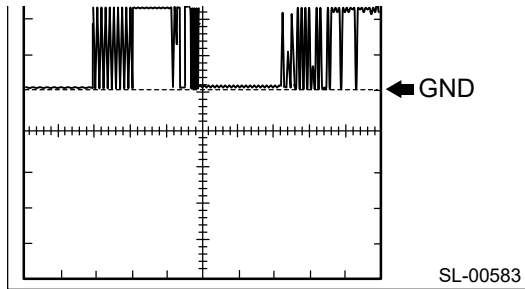
1. Waveform 1



Item	Content
Measured terminal	(B574) No. 1 (VC5) ↔ (B574) No. 24 (AGND)
Equipment setting	2 V/DIV, 200 ms/DIV
Measuring condition	Within 30 seconds after the push button ignition switch is pressed with IG OFF and access key not in the passenger room

2. Waveform 2



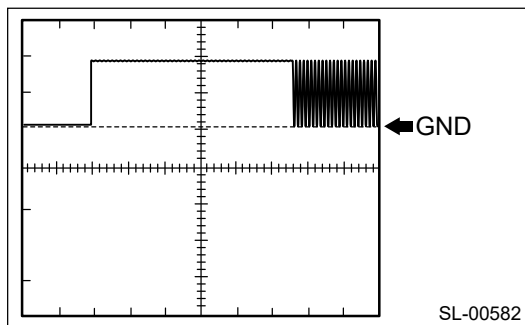


Item	Content
Measured terminal	(B574) No. 7 (CODE) ↔ (B574) No. 24 (AGND)
Equipment setting	2 V/DIV, 20 ms/DIV
Measuring condition	Turn the ignition switch to OFF and with the access key near the push button ignition switch, press the push button ignition switch. *1

Note:

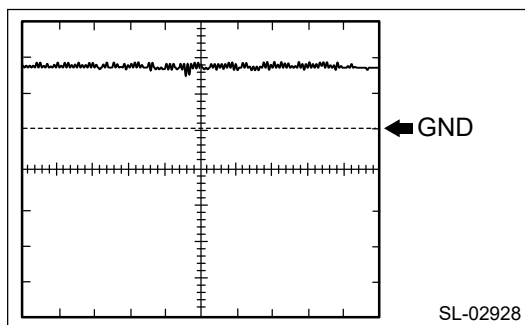
***1: Remove the access key battery before checking.**

3. Waveform 3



Item	Content
Measured terminal	(B574) No. 9 (TXCT) ↔ (B574) No. 24 (AGND)
Equipment setting	2 V/DIV, 20 ms/DIV
Measuring condition	Within 30 seconds after the push button ignition switch is pressed with IG OFF and access key not in the passenger room

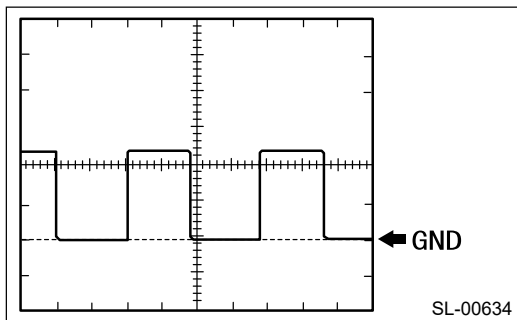
4. Waveform 4



Item	Content
Measured terminal	(B572) No. 13 (EGIO) ↔ (B572) No. 11 (GND)
Equipment setting	5 V/DIV, 100 ms/DIV

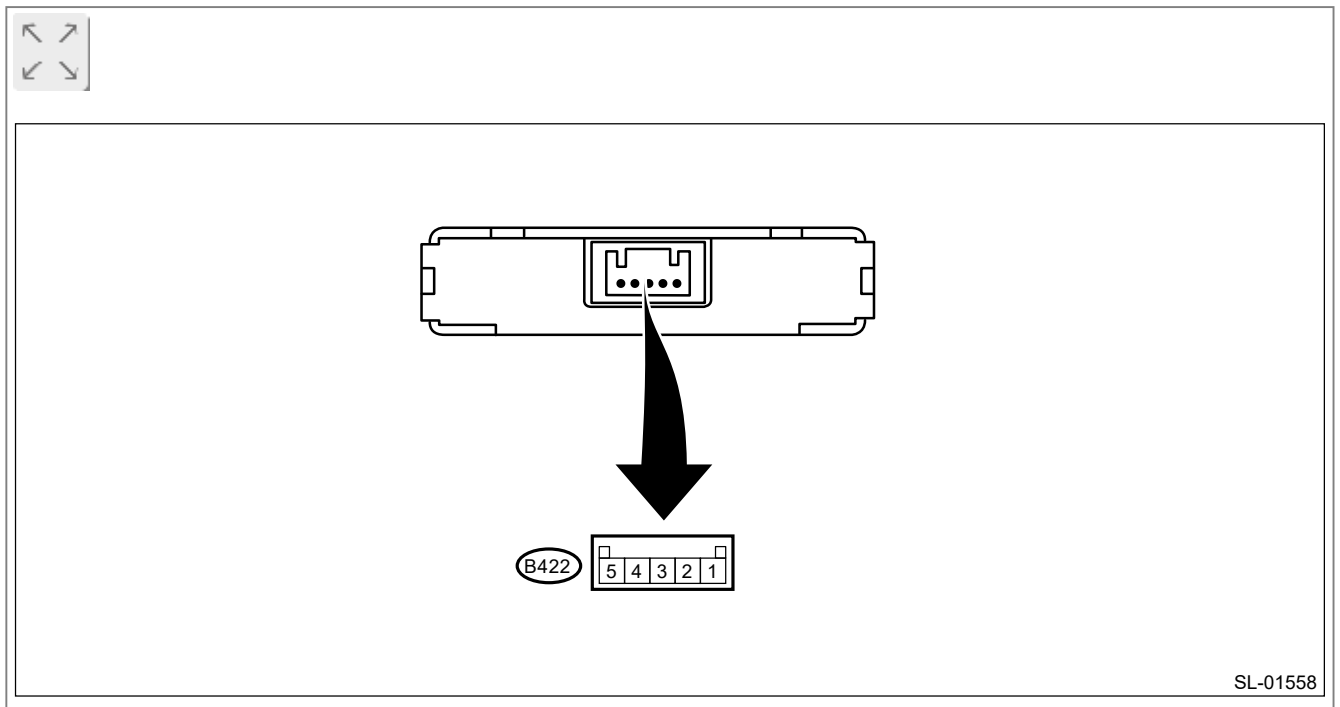
Equipment setting	5 V/DIV, 100 ms/DIV
Measuring condition	IG ON

5. Waveform 5



Item	Content
Measured terminal	(B574) No. 17 (TACH) ↔ Chassis ground
Equipment setting	5 V/DIV, 100 ms/DIV
Measuring condition	While engine idling

2. ID CODE BOX



Terminal No.	Terminal symbol	Content
(B422) No. 1	+B	+B
(B422) No. 2	LIN	LIN communication
(B422) No. 4	IMO1	Immobilizer communication 1
(B422) No. 5	GND	GND

Note:

Disconnect the control module connector before checking the following items.

Terminal No.	Standard	Measuring condition	Item
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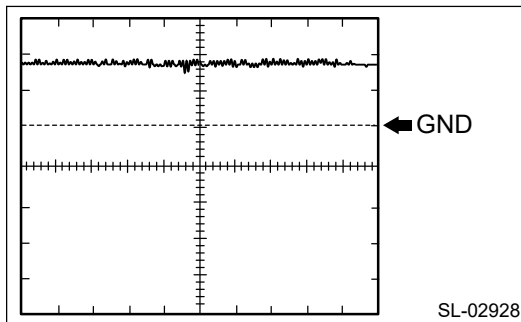
1 (+B) ↔ 5 (GND)	10 – 14 V	Always	Voltage
4 (IMO1) ↔ 5 (GND)	0 V	Ignition OFF	Voltage
5 (GND) ↔ Chassis ground	Continuity exists	Always	Continuity

Note:

Connect the control module connector before checking the following items.

Terminal No.	Standard	Measuring condition	Item
4 (IMO1) ↔ 5 (GND)	0 V	Ignition OFF	Voltage
4 (IMO1) ↔ 5 (GND)	Waveform 1	Ignition ON	Voltage

Waveform 1



Item	Content
Measured terminal	4 (IMO1) ↔ 5 (GND)
Equipment setting	5 V/DIV, 100 ms/DIV
Measuring condition	Ignition ON

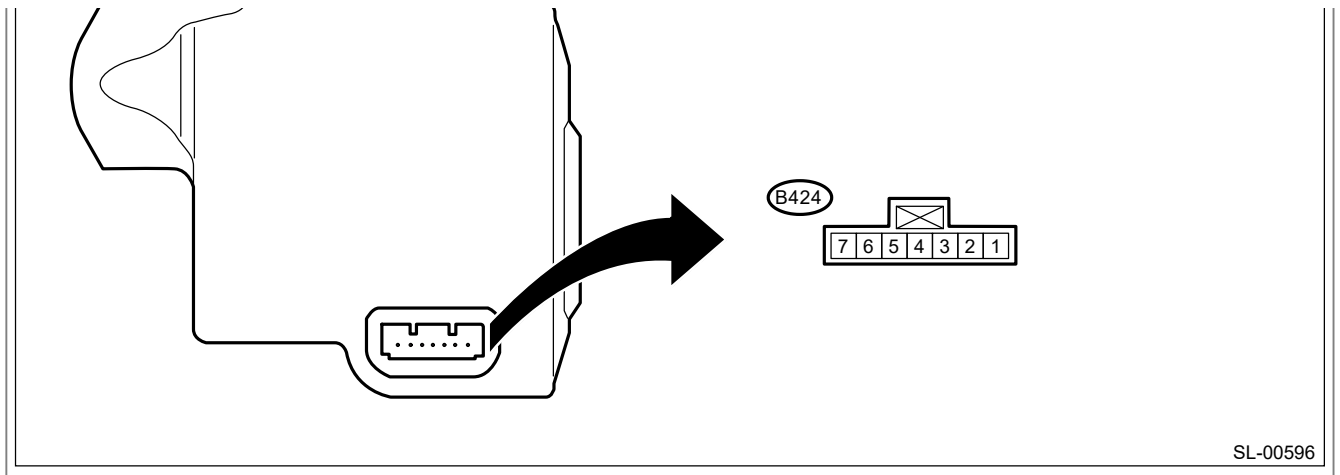
3. BODY INTEGRATED UNIT

Refer to the BODY CONTROL SYSTEM (DIAGNOSTICS) for the I/O Signal of the body integrated unit.

[📄 Ref. to BODY CONTROL\(DIAGNOSTICS\)>Control Module I/O Signal>ELECTRICAL SPECIFICATION.](#)

4. STEERING LOCK CM





Terminal No.	Terminal symbol	Content
(B424) No. 1	GND	GND
(B424) No. 3	SLR+	Steering lock motor drive power supply
(B424) No. 4	SLP	Unlock position output
(B424) No. 5	LIN	LIN communication
(B424) No. 6	IG2	IGN power supply
(B424) No. 7	B	+B

Note:

Perform the following check from the back side of the connector, with the connector of the control module connected.

If the measured value is out of standard, it is possible that the vehicle has a fault.

Terminal No.	Standard	Measuring condition	Item
1 (GND) ↔ Chassis ground	Continuity exists	Always	Continuity
2	—	—	—
3 (SLR+) ↔ Chassis ground	10 — 14 V → 1 V or less	Motor not operating → Motor operating	Voltage
4 (SLP) ↔ Chassis ground	10 — 14 V → 1 V or less	Lock → Unlock	Voltage
5 (LIN)	Input/output signal	—	—
6 (IG2) ↔ Chassis ground	10 — 14 V	Ignition ON	Voltage
7 (B) ↔ Chassis ground	10 — 14 V	Always	Voltage

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Data Monitor

LIST

1. KEYLESS ACCESS SYSTEM

Items to be displayed	Unit of measure	Content	Note
Driver's unlock touch sensor switch	ON/OFF	Keyless access CM input value	ON when the touch sensor (unlock) built on the back surface of the driver's door outer handle is touched
Passenger's unlock touch sensor switch	ON/OFF	Keyless access CM input value	ON when the touch sensor (unlock) built on the back surface of the passenger's door outer handle is touched
Driver's lock touch sensor SW	ON/OFF	Keyless access CM input value	ON when the touch sensor (lock) built on the surface of the driver's door outer handle is touched
Passenger's lock touch sensor SW	ON/OFF	Keyless access CM input value	ON when the touch sensor (lock) built on the surface of the passenger's door outer handle is touched
Rear Gate Request SW	ON/OFF	Keyless access CM input value	ON when rear lock button is pressed
Secret code Keyless registration	unregistered / registered	Keyless access CM input value	When in secret code keyless registration, registered
IGN SW	ON/OFF	Keyless access CM input value	ON when ignition is ON
B/up fuse	Connecting / OFF	Keyless access CM internal value	When backup fuse is connected, Connecting
ACC SW	ON/OFF	Keyless access CM input value	ON when accessory or ignition is ON
Incorrect vehicle ID	Yes / No	Keyless access CM internal value	When the access key is different when keyless access is performed, Yes
No response	Yes / No	Keyless access CM internal value	When there is no response from the access key when keyless access is performed, Yes
Incorrect response code, format	Yes / No	Keyless access CM internal value	When the response from the access key differs when keyless access is performed, Yes
Exhausted battery	Yes / No	Keyless access CM internal value	When the access key battery is depleted, Yes

Incorrect response code, ID code	Yes / No	Keyless access CM internal value	When the response from the access key is different when keyless access is performed, Yes
Incorrect response code, collation result	Yes / No	Keyless access CM internal value	When the response from the access key is different when keyless access is performed, Yes
Incorrect ID code	Yes / No	Keyless access CM internal value	When the response from the access key is different when keyless access is performed, Yes
Incorrect rolling code	Yes / No	Keyless access CM internal value	When the response from the access key is different when keyless access is performed, Yes
Smart Cancel	Cancel / Normal	Keyless access CM internal value	When the keyless access function is stopped, Cancel
Simple Smart system cancel	Cancel / Normal	Keyless access CM internal value	When the simple cancel function is set, Cancel
ID Code Box W/H Connection State	Connecting / OFF	Keyless access CM internal value	Connecting status of the terminal (B573) No. 15 (IDW)
ID Code Box Existence Judging	Support / No Support / Existence Judging	Keyless access CM internal value	Normally, Existence Judging
Immobilizer	Set / Unset	Keyless access CM internal value	When the immobilizer is set, Set
Remote engine starter communication ID confirmation	NG / OK	Keyless access CM internal value	When using a registered remote control engine starter, OK
Remote engine starter code registration confirmation	Unregistered / OK	Keyless access CM internal value	Registered when the code is registered
STLC sleep possible status	Possible / Impossible	Steering lock CM internal value	When sleep is possible, Possible
STLC wake-up transmission status	Transmission / No transmission	Steering lock CM internal value	When the wake-up signal is transmitted, Transmission
Lock side sensor status	ON/OFF	Steering lock CM internal value	ON when steering lock is locked
Unlock side sensor status	ON/OFF	Steering lock CM internal value	ON when steering lock is unlocked
Lock confirmation	Confirmed / Unconfirmed	Steering lock CM internal value	When steering lock is locked, Confirmed
Unlock confirmation	Confirmed /	Steering lock CM	When steering lock is unlocked,


	Unconfirmed	internal value	Confirmed
Sensor initialization	Completed / incomplete	Steering lock CM internal value	When sensor initial operation is completed, Completed
Motor protection control status	Rejected range / Permitted range	Steering lock CM internal value	When motor protection control is not activated, Rejected range
Motor operation prohibition voltage evaluation	Permit / OFF	Steering lock CM internal value	When motor operation is prohibited, OFF
Diagnosis response	Normal / response	Steering lock CM internal value	When diagnostic communication is in progress, response
Sensor abnormal	Receive / FAIL	Steering lock CM internal value	When a trouble occurs in steering lock CM, FAIL
Motor power supply short-circuit abnormal	Receive / FAIL	Steering lock CM internal value	When a trouble occurs in steering lock CM, FAIL
Motor driver short-circuit abnormal	Receive / FAIL	Steering lock CM internal value	When a trouble occurs in steering lock CM, FAIL
Lock bar engagement abnormal	Receive / FAIL	Steering lock CM internal value	ON when the steering lock bar has experienced interference
Push start abnormal	Receive / FAIL	Steering lock CM internal value	When a trouble occurs in steering lock CM, FAIL
Lock side relay operation	Stopped / Operating	Steering lock CM internal value	When the status changes as unlock → lock, Operating
Unlock side relay operation	Stopped / Operating	Steering lock CM internal value	When the status changes as lock → unlock, Operating
Motor drive FET drive	Stopped / Operating	Steering lock CM internal value	When motor drive FET is operating, Operating
Motor reversal protection control	Stopped / Operating	Steering lock CM internal value	When motor drive FET is operating, Operating
Engine start	Engine start permission / Engine start prohibition	Steering lock CM internal value	Permitted when ignition ON
Sensor abnormal (past)	Receive / FAIL	Steering lock CM internal value	When a trouble occurs in steering lock CM, FAIL
Motor power supply short-circuit abnormal (past)	Receive / FAIL	Steering lock CM internal value	When a trouble occurs in steering lock CM, FAIL
Motor driver short-circuit abnormal (past)	Receive / FAIL	Steering lock CM internal value	When a trouble occurs in steering lock CM, FAIL
Steering lock lock/unlock command reception history	Support / No Support	Steering lock CM internal value	When steering lock is locked → unlocked, or unlocked → locked, Support
Lock bar engagement abnormal (past)	Support / No Support	Steering lock CM internal value	When the steering lock bar has experienced interference in the

			past, Support
Push start abnormal (past)	Receive / FAIL	Steering lock CM internal value	When a trouble occurs in steering lock CM, FAIL
STLC Abnormal EEPROM access	Receive / FAIL	Steering lock CM internal value	When a trouble occurs in steering lock CM, FAIL
ID code BOX sleep possible status	Impossible / Possible	Keyless access CM internal value (models without ID code box) or ID code box internal value (models with ID code box)	When sleep is possible, Possible
ID code BOX wake-up transmission status	No transmission / Transmission	Keyless access CM internal value (models without ID code box) or ID code box internal value (models with ID code box)	When the wake-up signal is transmitted, Transmission
ID code BOX Abnormal EEPROM access (now)	Receive / FAIL	Keyless access CM internal value (models without ID code box) or ID code box internal value (models with ID code box)	When the ID code box is abnormal, FAIL
EGI code reception status	Reception / Not yet received	Keyless access CM internal value (models without ID code box) or ID code box internal value (models with ID code box)	When the engine start operation is performed, Reception
Engine start permission request reception status	Reception / Not yet received	Keyless access CM internal value (models without ID code box) or ID code box internal value (models with ID code box)	When the ignition is ON, Reception
Provisional injection request reception status	Reception / Not yet received	Keyless access CM internal value (models without ID code box) or ID code box internal value	When the ignition is ON, Reception

		(models with ID code box)	
Code collation result between smart ECM and ID code box	Receive / FAIL	Keyless access CM internal value (models without ID code box) or ID code box internal value (models with ID code box)	When engine start is possible, Receive
Code collation result between steering locked ECM and ID code box	Receive / FAIL	Keyless access CM internal value (models without ID code box) or ID code box internal value (models with ID code box)	When steering lock operation is possible, Receive
Steering lock unlock request reception status	Reception (keep 10 sec) / Not yet received	Keyless access CM internal value (models without ID code box) or ID code box internal value (models with ID code box)	Receive when steering lock is performing unlock
Steering lock lock request reception status	Reception (keep 10 sec) / Not yet received	Keyless access CM internal value (models without ID code box) or ID code box internal value (models with ID code box)	Receive when steering lock is performing lock
Driver's external transmitter output circuit abnormal	Receive / FAIL	Keyless access CM internal value	When a trouble occurs in transmitter output circuit, FAIL
Passenger's external transmitter output circuit abnormal	Receive / FAIL	Keyless access CM internal value	When a trouble occurs in transmitter output circuit, FAIL
Driver's external transmitter output circuit abnormal (past)	Receive / FAIL	Keyless access CM internal value	When a trouble occurs in transmitter output circuit in the past, FAIL
Passenger's external transmitter output circuit abnormal (past)	Receive / FAIL	Keyless access CM internal value	When a trouble occurs in transmitter output circuit in the past, FAIL
ID code registration mode status	Normal / Regist. / Deletion	—	For immobilizer registration
Smart related ECM	On mode /		

code registration mode status	Normal		
ID code collation completion confirmation	Completed / Normal		
ID code registration completion confirmation	Completed / Normal		
Smart related ECM code registration completion confirmation	Completed / Normal		
Registered smart key confirmation status	Confirming / Normal		
Smart related ECM code confirmation status	Confirming / Normal		
ID code registration status	Registering / Normal		
ID code collation status	Normal / Collating the immobilizer / Collating the smart		
All registered keys confirmation status	Confirming / Normal		
Confirmed number of all registered keys	0 – 7		
Number of required registrations (smart)	0 – 7		
Number of collation completed (smart)	0 – 7		
Number of registration completed (smart)	0 – 7	Keyless access CM internal value	Number of recognized keyless access CM
ID Code Box	Connecting / OFF	Keyless access CM internal value	When the ID code box connection is normal, Connecting
Steering Lock ECM	Connecting / OFF	Keyless access CM internal value	When the steering lock CM connection is normal, Connecting
Driver's lock request SW/touch sensor switch ON edge record	Support / No Support	Keyless access CM internal value	The display is continued when the collation is once established as Support by the combination indicated on the left.
Passenger's lock request SW/touch	Support / No Support	Keyless access CM internal value	Note:

sensor switch ON edge record			
Rear gate lock request SW ON edge history	Support / No Support	Keyless access CM internal value	
Driver's unlock touch sensor switch ON edge record	Support / No Support	Keyless access CM internal value	
Passenger's unlock touch sensor switch ON edge record	Support / No Support	Keyless access CM internal value	
Collation OK result history (driver's external transmitter + interior tuner)	Support / No Support	Keyless access CM internal value	
Collation OK result history (passenger's external transmitter + interior tuner)	Support / No Support	Keyless access CM internal value	
Collation OK result history (front interior transmitter + interior tuner)	Support / No Support	Keyless access CM internal value	
Collation OK result history (rear interior transmitter + interior tuner)	Support / No Support	Keyless access CM internal value	
Collation OK result history (rear gate internal transmitter + interior tuner)	Support / No Support	Keyless access CM internal value	
Collation OK result history (rear gate external transmitter + interior tuner)	Support / No Support	Keyless access CM internal value	
Collation OK result history (immobilizer amplifier + immobilizer amplifier)	Support / No Support	Keyless access CM internal value	
Push start SW 1	ON/OFF	Keyless access CM input value	ON when push button start is pressed
Push start SW 2	ON/OFF	Keyless access CM input value	ON when push button start is pressed
Stop Light Switch	ON/OFF	Keyless access CM input value	ON when brake pedal is depressed

When confirming the data on the left, confirm after performing Keyless access system check.  Ref. to [KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)> Keyless Access System Check.](#)

Steering unlock SW	ON/OFF	Keyless access CM input value	OFF when steering locked
Shift P signal(AT only)	ON/OFF	Keyless access CM input value	ON when the shift position is P
Neutral SW/Clutch SW	ON/OFF	Keyless access CM output value	ON when the shift position is at P or N
Shift N signal(AT only)	ON/OFF	Keyless access CM input value	ON when the shift position is "N"
Delivery mode signal(AT only)	ON/OFF	Keyless access CM input value	OFF when in other than the delivery mode
IGN2 relay monitor (drive output)	ON/OFF	Keyless access CM output value	ON during IG relay 2 (push button start) drive output
IGN1 relay monitor (drive output)	ON/OFF	Keyless access CM output value	ON during IG relay 1 (push button start) drive output
ACC relay monitor	ON/OFF	Keyless access CM output value	ON during accessory relay (push button start) drive output
IGN2 relay monitor (coil voltage)	ON/OFF	Keyless access CM output value	ON during IG relay 2 (push button start) drive output
IGN1 relay monitor (coil voltage)	ON/OFF	Keyless access CM output value	ON during IG relay 1 (push button start) drive output
IGN latch monitor	ON/OFF	Keyless access CM output value	ON during IG relay 2 (push button start) drive output
STSW signal monitor	ON/OFF	Keyless access CM output value	ON when brake pedal (except MT model) or clutch pedal (MT model) is depressed, and push button ignition switch is pressed
ACCR signal	ON/OFF	Keyless access CM input value	ON during starter relay drive output
Vehicle speed signal	Drive status / Stop status	Keyless access CM input value	Driving when vehicle speed is input
Engine Speed	Rotating / Stopped	Keyless access CM input value	Rotating when engine driven
Power supply status	All OFF status	Keyless access CM output value	Displayed when IG relay 1 (push button start), IG relay 2 (push button start), and accessory relay (push button start) are all OFF
	ACC relay ON status	Keyless access CM output value	Displayed when accessory ON
	IGN1 relay ON status	Keyless access CM output value	Display when ignition ON
	IGN2 relay ON status	Keyless access CM output value	Display when ignition ON
	STSW Condition	Keyless access CM	Displayed when brake pedal

		output value	(except MT model) or clutch pedal (MT model) is depressed, and push button ignition switch is pressed
Powertrain Type	GAS MT / GAS AT / HEV AT / Auto Start Stop MT / Auto Start Stop AT	Keyless access CM output value	Equipped vehicle is displayed.
IG1 outside circuit abnormal	No / Yes	Keyless access CM output value	When IGN1 external circuit is faulty, Yes
IG2 outside circuit abnormal	No / Yes	Keyless access CM output value	When IGN2 external circuit is faulty, Yes
Start SW trouble	No / Yes	Keyless access CM output value	When start SW is faulty, Yes
P signal mismatch	No / Yes	Keyless access CM output value	When P signals are inconsistent between CAN line and direct line, Yes
Steering lock unlock wait time-out	No / Yes	Keyless access CM output value	When the steering lock release time out occurred, Yes
Key collation waiting time out	No / Yes	Keyless access CM output value	When the key collation time out occurred, Yes

2. BODY INTEGRATED UNIT

Refer to BODY CONTROL SYSTEM (DIAGNOSTICS) for the data monitor of the body integrated unit.

 [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Data Monitor.](#)

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Data Monitor

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Keyless Access with Push Button Start], and then select [Enter].
5. On [Select Function] display, select [Data monitor].

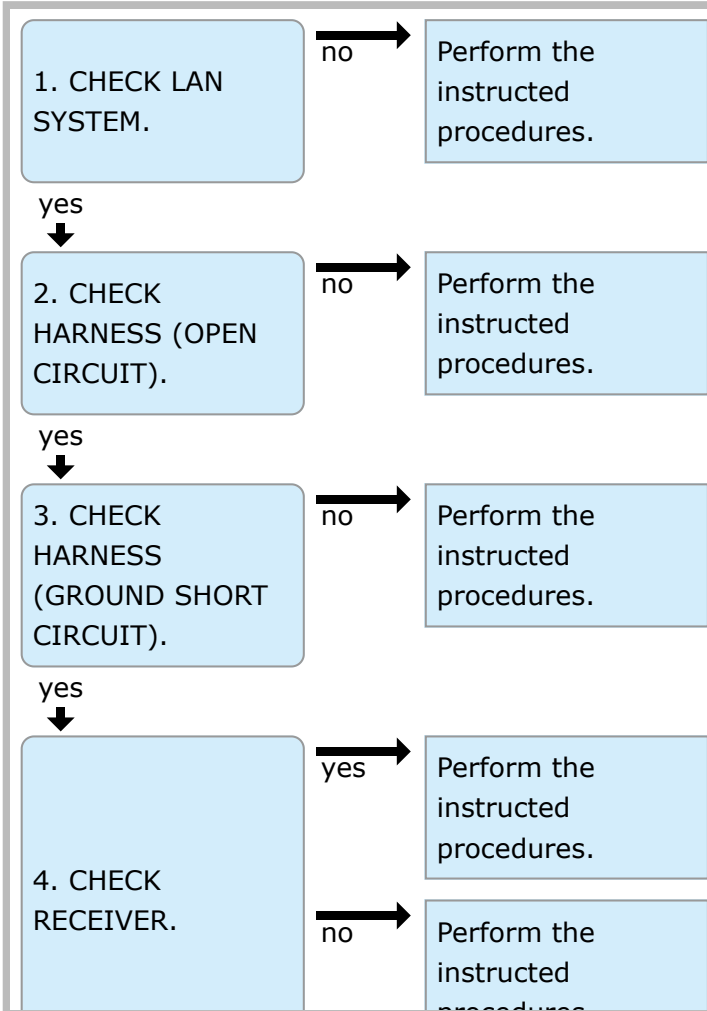
Note:

For detailed operation procedures, refer to "Application help".

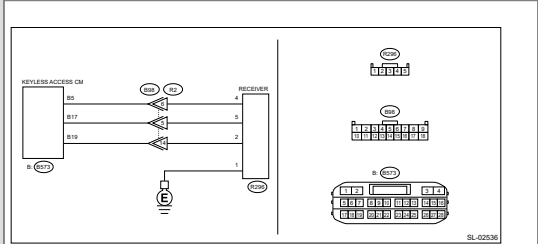
KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1242 WIRELESS TUNER

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Push button start system [Ref. to WIRING DIAGRAM SYSTEM>Push Button Start System>WIRING DIAGRAM](#)



Click the image to see the enlarged image

- Caution:**
- For replacement procedure of keyless access CM, refer to the "REGISTRATION FOR IMMOBILIZER" provided as volume.
 - When the harness comes close to receiver, the performance of keyless access system operation and wireless communication reduce. So, when replacing or installing receiver and harness, do not change route and length of the surrounding harnesses.

START

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1571 REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM)

DTC detecting condition:

Incompatibility of reference code between keyless access CM (model without ID code box) or ID code box (model with ID code box) and ECM occurs.

Trouble symptom:

Engine will not start.

1. CHECK ECM.

Perform ECM registration. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is ECM registration finished? And does the engine start?

Yes

ECM registration was not performed properly.

No

[Go to 2.](#)

2. REPLACE ECM.

1. Install the ECM from other normal operating vehicle (with push button start) which use same ECM to the vehicle to be diagnosed.
2. Perform ECM registration. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is ECM registration finished? And does the engine start?

Yes

Replace the ECM. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\).](#) [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Engine Control Module \(ECM\).](#) Install the ECM from other vehicle to the original vehicle.

No

Replace the keyless access CM (model without ID code box) [Ref. to SECURITY AND LOCKS>Keyless Access CM.](#) or the ID code box (model with ID code box). [Ref. to SECURITY AND LOCKS>ID Code Box.](#)

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1572 IMM CIRCUIT EXCEPT ANTENNA CIRCUIT

1. EXCEPT FOR C0 AND C5

DTC detecting condition:

Communication error between keyless access CM and ECM

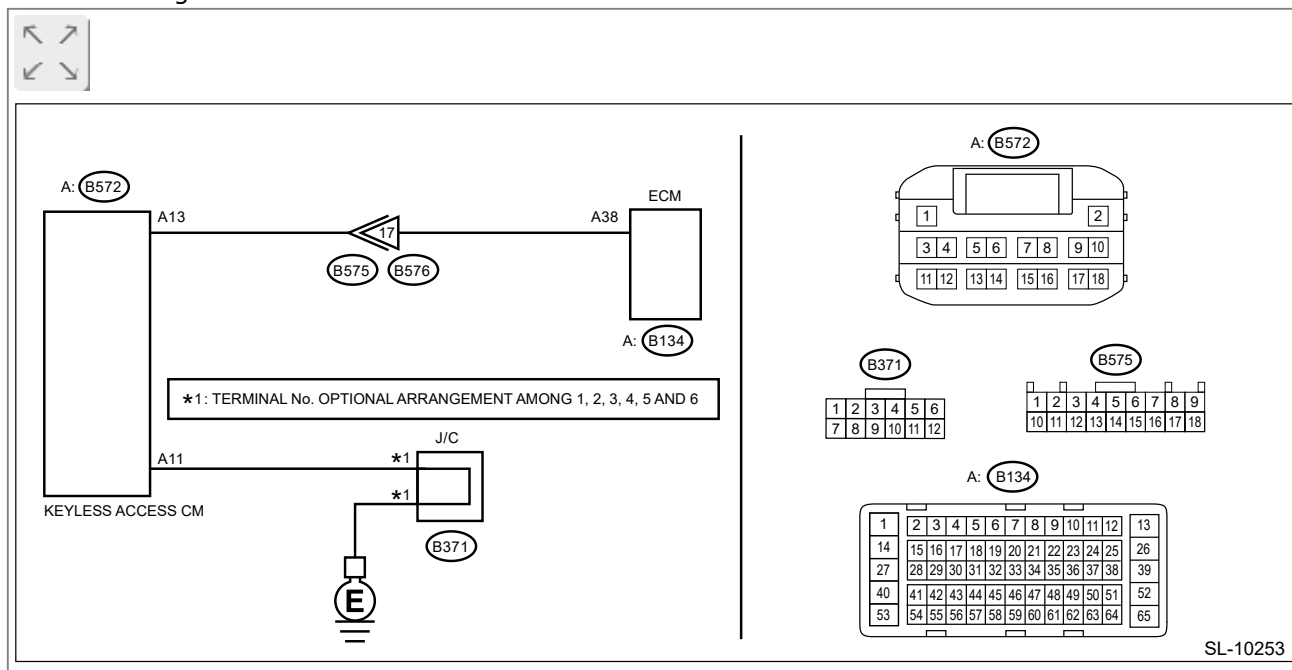
Trouble symptom:

Engine will not start.

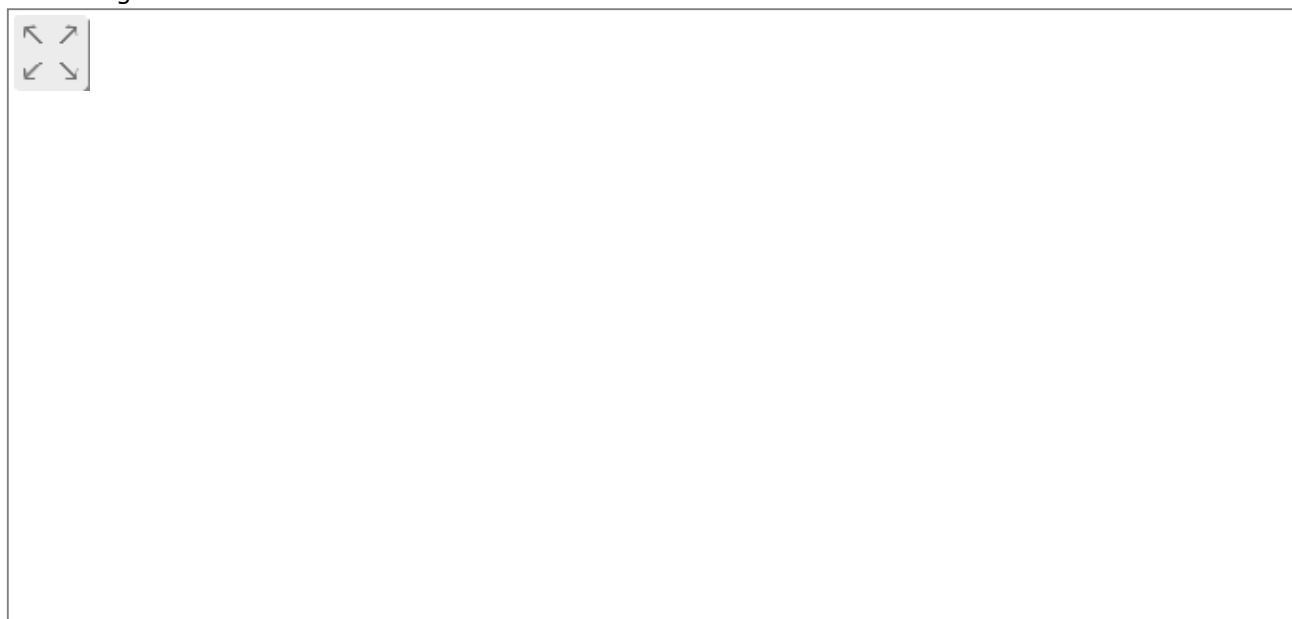
Wiring diagram:

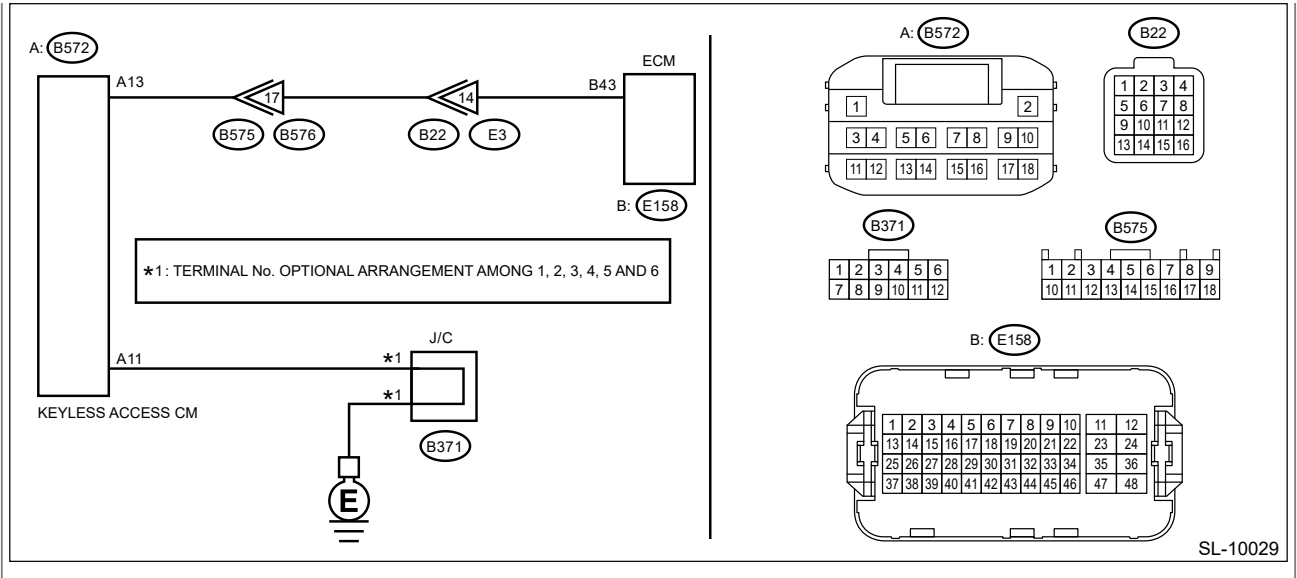
Push button start system  [Ref. to WIRING SYSTEM>Push Button Start System>WIRING DIAGRAM.](#)

- Non-turbo engine model



- Turbo engine model





1. CHECK GROUNDING POINT.

Check the grounding point of the engine ground and chassis ground.

Is there any looseness? Are there any foreign matters caught on the ground or contact surface?
Are there any oil-soiled areas?

Yes

Remove the foreign matters, and tighten to the specified torque. Then start the engine, and check that the fault was removed. Check the DTC [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#), and when DTC B1572 is still displayed, go to 2.

No

[Go to 2.](#)

2. CHECK DATA MONITOR.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check the data monitor. [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Data Monitor.](#)
3. Display the following data: [Immobilizer] [Engine start] [Unlock confirmation].

Data

Immobilizer = Unset:

Engine start = Engine start permission:

Unlock confirmation = Confirmed:

Is the data displayed as described above?

Yes


[Go to 3.](#)

No

Perform diagnostics with phenomenon. [Ref. to KEYLESS ACCESS WITH PUSH](#)

[BUTTON START\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > ENGINE DOES NOT START.](#)

3. CHECK DATA MONITOR.

Use the Subaru Select Monitor to check the data monitor when holding down the push button ignition switch while depressing on the brake pedal (AT model) or clutch pedal (MT model). 
[Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Data Monitor.](#)

Data

EGI code reception status = Reception:

Note:

**If Reception is displayed, the status changes to Not yet received in 10 seconds.
When performing the check again, perform the check after turning the ignition to OFF.**

Is the data displayed as described above?

Yes

 [Go to 4.](#)

No

Repair or replace the harness between keyless access CM and ECM.

4. CHECK WIRING HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the keyless access CM connector and ECM connector.
3. Using a tester, measure the resistance between the keyless access CM connector and ECM connector.

Connector & terminal

Non-turbo engine model

(B572) No. 13 — (B134) No. 38:

Turbo engine model

(B572) No. 13 — (E158) No. 43:

Is the resistance less than 10 Ω ?

Yes

 [Go to 5.](#)

No

Repair or replace the open circuit of harness.

5. CHECK WIRING HARNESS.

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(B572) No. 11 — Chassis ground:

Is the resistance less than 10 Ω?

Yes

 [Go to 6.](#)

No



Repair or replace the open circuit of harness.

6. CHECK ECM.


1. Install the ECM from other normal operating vehicle (with push button start) which use same ECM to the vehicle to be diagnosed.
2. Perform ECM registration. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is ECM registration finished? And does the engine start?

Yes

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\)>REMOVAL.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\)>REMOVAL.](#) Install the ECM from other vehicle to the original vehicle.

No

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM.](#)

2. FOR C0 AND C5 ONLY

DTC detecting condition:

Communication error between ID code box and ECM

Trouble symptom:

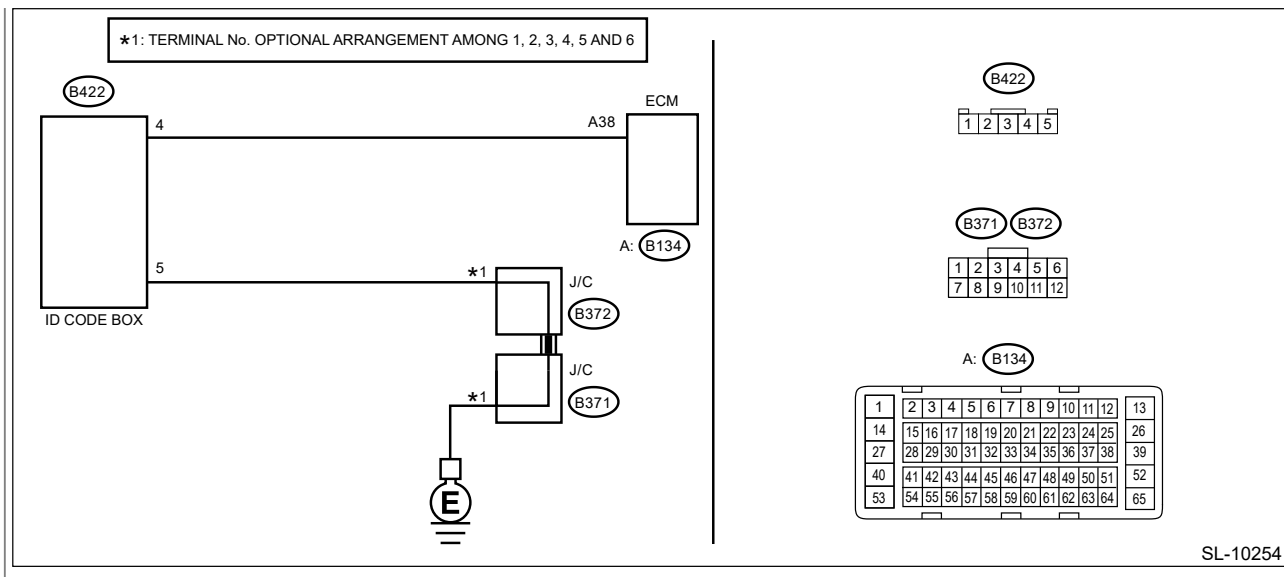
Engine will not start.

Wiring diagram:

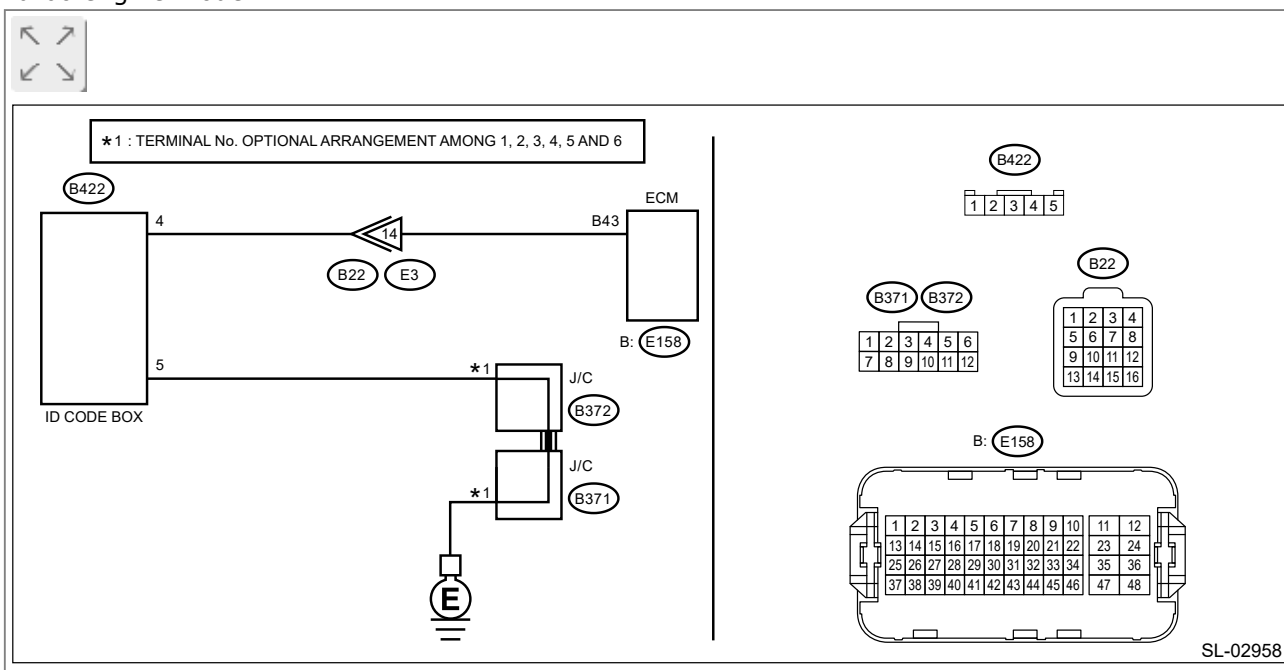
Push button start system  [Ref. to WIRING SYSTEM>Push Button Start System>WIRING DIAGRAM.](#)

- Non-turbo engine model





• Turbo engine model



1. CHECK GROUNDING POINT.

Check the grounding point of the engine ground and chassis ground.

Is there any looseness? Are there any foreign matters caught on the ground or contact surface?
Are there any oil-soiled areas?

Yes


Remove the foreign matters, and tighten to the specified torque. Then start the engine, and check that the fault was removed. Check the DTC [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#), and when DTC B1572 is still displayed, go to 2.

No

[Go to 2.](#)

2. CHECK DATA MONITOR.



1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check the data monitor.  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Data Monitor.](#)
3. Display the following data: [Immobilizer] [Engine start] [Unlock confirmation].

Data

Immobilizer = Unset:

Engine start = Engine start permission:


Unlock confirmation = Confirmed:

Is the data displayed as described above?

Yes


 [Go to 3.](#)

No

Perform diagnostics with phenomenon.  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > ENGINE DOES NOT START.](#)

3. CHECK DATA MONITOR.



Use the Subaru Select Monitor to check the data when holding down the push button ignition switch while depressing on the brake pedal (AT model) or clutch pedal (MT model).  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Data Monitor.](#)

Data

EGI code reception status = Reception:

Note:

If Reception is displayed, the status changes to Not yet received in 10 seconds.

When performing the check again, perform the check after turning the ignition to OFF.

Is the data displayed as described above?

Yes

 [Go to 4.](#)

No

Repair or replace the harness between ID code box and ECM.

4. CHECK WIRING HARNESS.



1. Turn the ignition switch to OFF.
2. Disconnect the ID code box connector and the ECM connector.
3. Using a tester, measure the resistance between ID code box connector and ECM connector.

Connector & terminal

Non-turbo engine model

(B422) No. 4 — (B134) No. 48:

Turbo engine model

(B422) No. 4 — (E158) No. 43:

Is the resistance less than 10 Ω?

Yes

 [Go to 5.](#)

No

Repair or replace the open circuit of harness.

5. CHECK WIRING HARNESS.

Using a tester, measure the resistance between ID code box connector and chassis ground.

Connector & terminal

(B422) No. 5 — Chassis ground:

Is the resistance less than 10 Ω?

Yes

 [Go to 6.](#)

No



Repair or replace the open circuit of harness.

6. CHECK ECM.


1. Install the ECM from other normal operating vehicle (with push button start) which use same ECM to the vehicle to be diagnosed.
2. Perform ECM registration. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is ECM registration finished? And does the engine start?

Yes

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Control Module \(ECM\)>REMOVAL.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Control Module \(ECM\)>REMOVAL.](#) Install the ECM from other vehicle to the original vehicle.

No

Replace the ID code box.  [Ref. to SECURITY AND LOCKS>ID Code Box.](#)

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1576 EGI CONTROL MODULE EEPROM

DTC detecting condition:

- ECM malfunctioning
- When the ROM in ECM was inaccessible during registration.

1. PERFORM ECM REGISTRATION.


Perform ECM registration. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is ECM registration complete?

Yes

Make sure that the engine can start. This completes the work.

No

 [Go to 2.](#)

2. PERFORM ECM REGISTRATION.

Perform ECM registration. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is ECM registration complete?

Yes

Make sure that the engine can start. This completes the work.

No

 [Go to 3.](#)

3. PERFORM ECM REGISTRATION.

Perform ECM registration. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.


Is ECM registration complete?

Yes

Make sure that the engine can start. This completes the work.

No

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\).](#)

(H4DO)>Engine Control Module (ECM)>REMOVAL.  Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM)>REMOVAL.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1577 IMM CONTROL MODULE EEPROM

1. EXCEPT FOR C0 AND C5

DTC detecting condition:

- Defective keyless access CM
- When inaccessible to ROM in keyless access CM.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Perform the clear memory operation of ECM. [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Clear Memory Mode.](#)
3. Turn the ignition switch to OFF.
4. Remove and install the battery.
5. Turn the ignition switch to ON.
6. After 5 seconds or more, read DTC. [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1577 displayed?

Yes Replace the keyless access CM. [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

No Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:
In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.


2. FOR C0 AND C5 ONLY

DTC detecting condition:

- ID code box malfunction
- When inaccessible to ROM in ID code box.


1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Perform the clear memory operation of ECM. [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Clear Memory Mode.](#)

3. Turn the ignition switch to OFF.
4. Register the ID code box.
5. Read the DTC again.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1577 displayed?

Yes

Replace the ID code box.  [Ref. to SECURITY AND LOCKS>ID Code Box.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

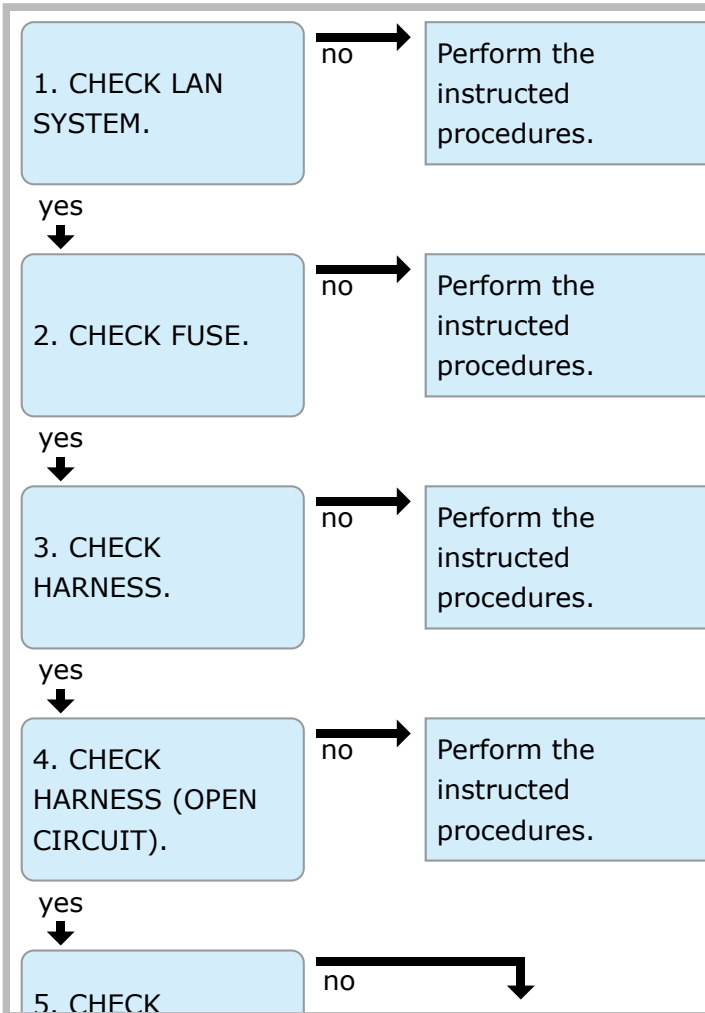
Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

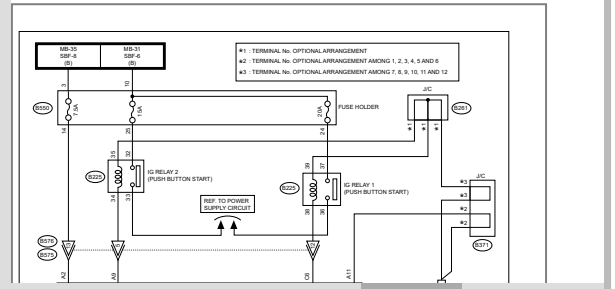
KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2271 IGN RELAY CONTROL CIRCUIT

CAUTION/NOTE INTRO



Wiring diagram:
 Push button start system [Ref. to WIRING SYSTEM>Push Button Start System>WIRING](#)



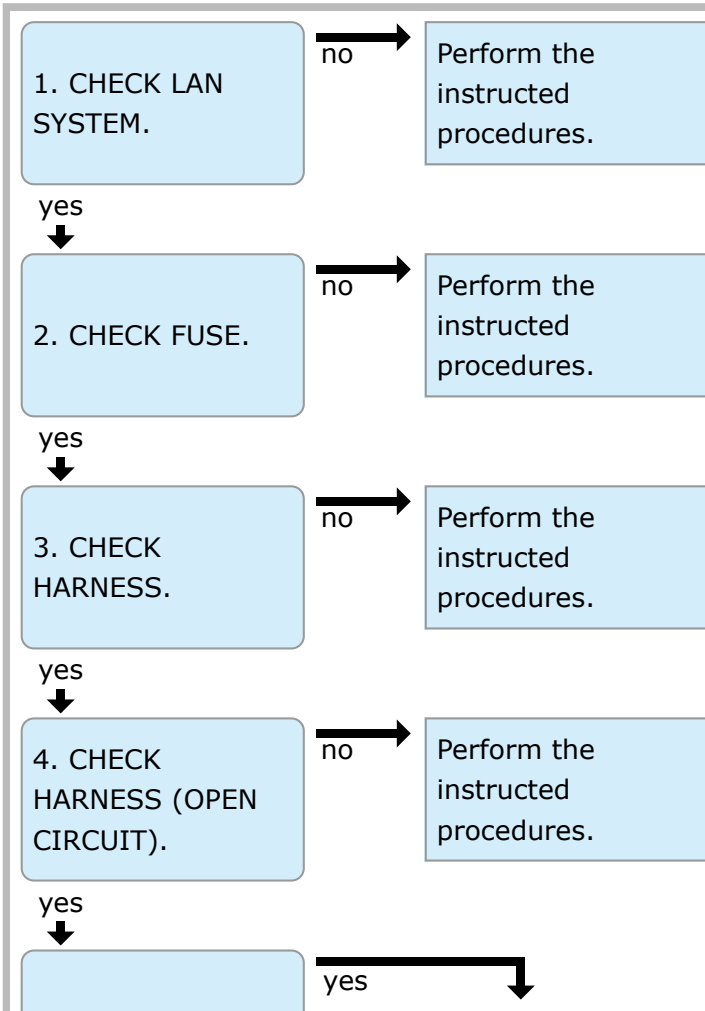
Caution:
 For replacement procedure of keyless CM, refer to the "REGISTRATION M IMMOBILIZER" provided as a separate document.

START

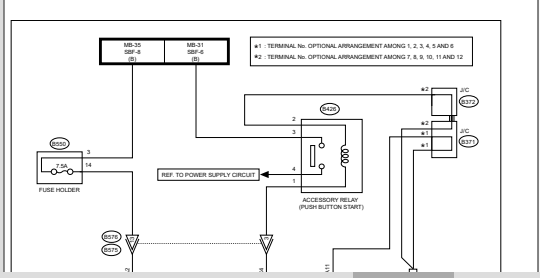
KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2274 ACC RELAY CONTROL CIRCUIT

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Push button start system [Ref. to WIRING SYSTEM>Push Button Start System>WIRING](#)



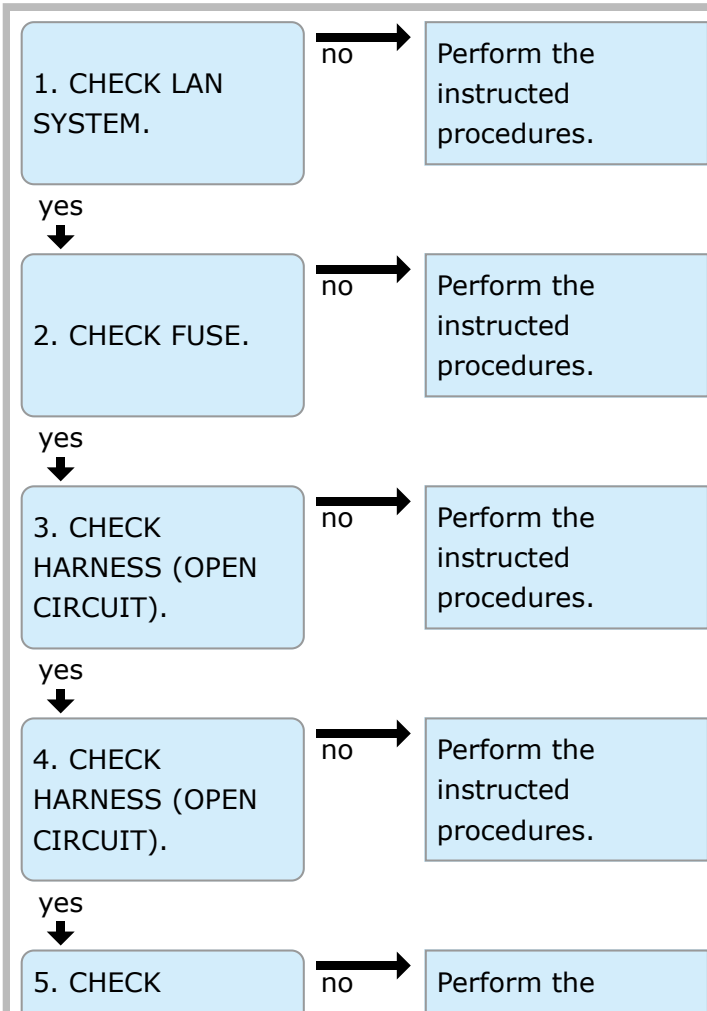
Caution:
 For replacement procedure of keyless entry system (CM), refer to the "REGISTRATION METHOD FOR KEYLESS ENTRY SYSTEM" and "IMMOBILIZER" provided as a separate document.

START

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

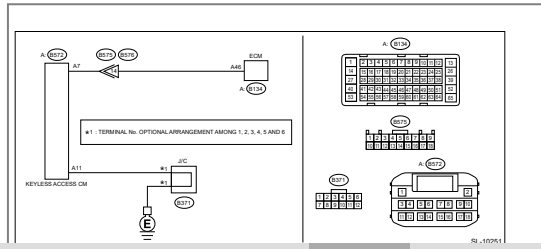
DTC B2275 ENGINE START REQUEST CONTROL CIRCUIT

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Push button start system [Ref. to WIRING DIAGRAM SYSTEM>Push Button Start System>WIRING DIAGRAM](#)

- Non-turbo model



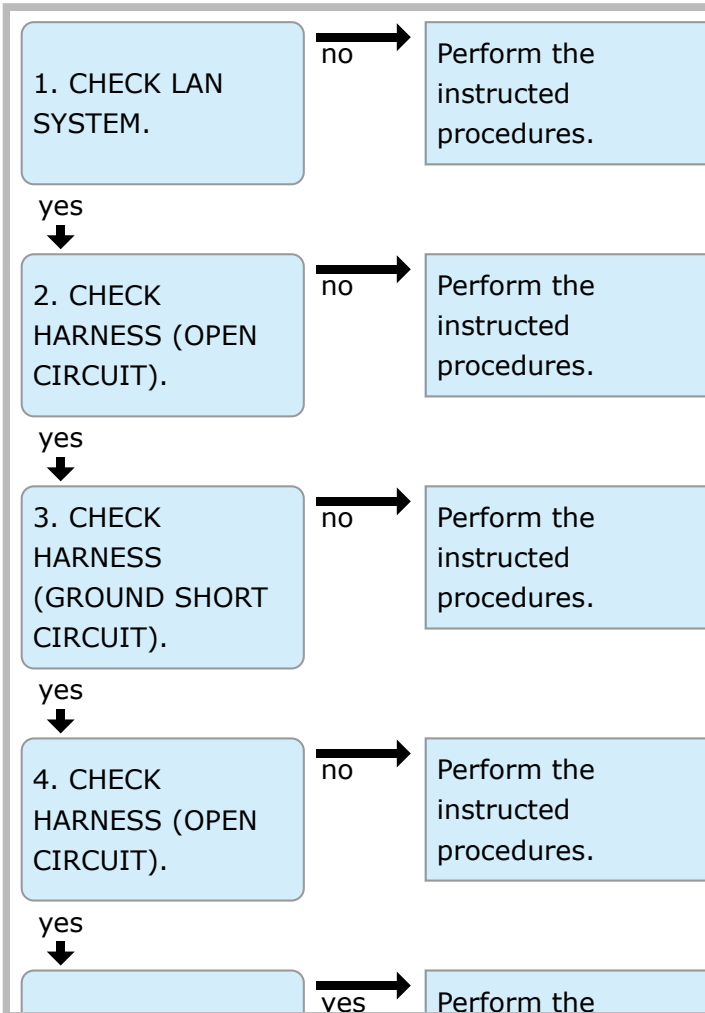
Caution:
 For replacement procedure of keyless access control module (CM), refer to the "REGISTRATION METHOD FOR KEYLESS ACCESS CONTROL MODULE (CM) IMMOBILIZER" provided as a separate document.

START

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

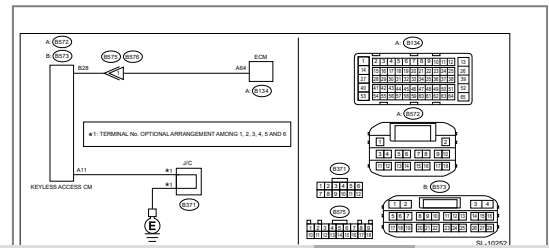
DTC B2276 ACC RELAY OFF SIGNAL

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Push button start system [Ref. to WIRING DIAGRAM SYSTEM>Push Button Start System>WIRING DIAGRAM](#)

- Non-turbo model



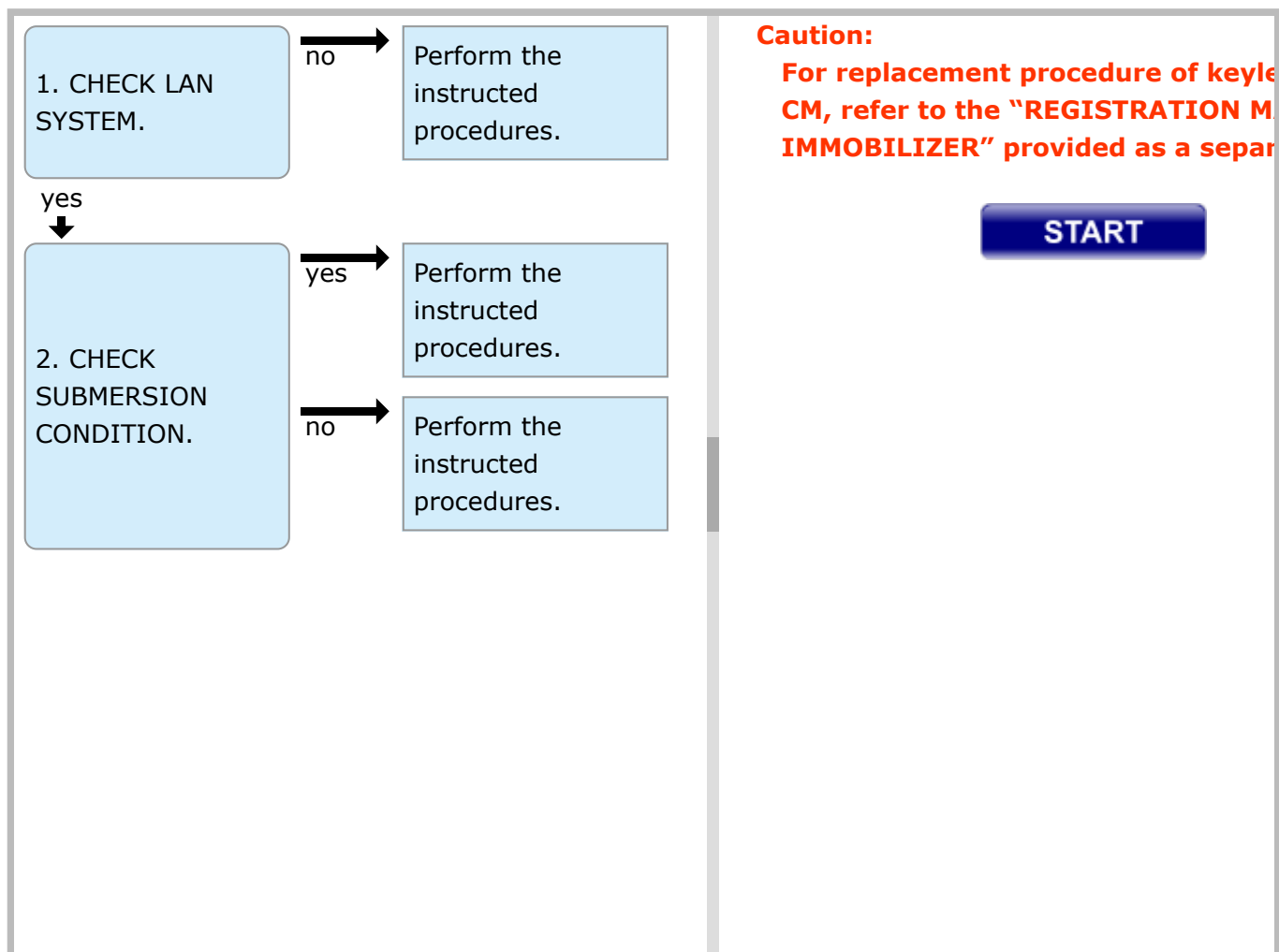
Caution:
 For replacement procedure of keyless access control module (KACM), refer to the "REGISTRATION METHOD FOR KEYLESS ACCESS CONTROL MODULE (KACM) AND IMMOBILIZER" provided as a separate document.

START

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2277 SUBMERGING CIRCUIT

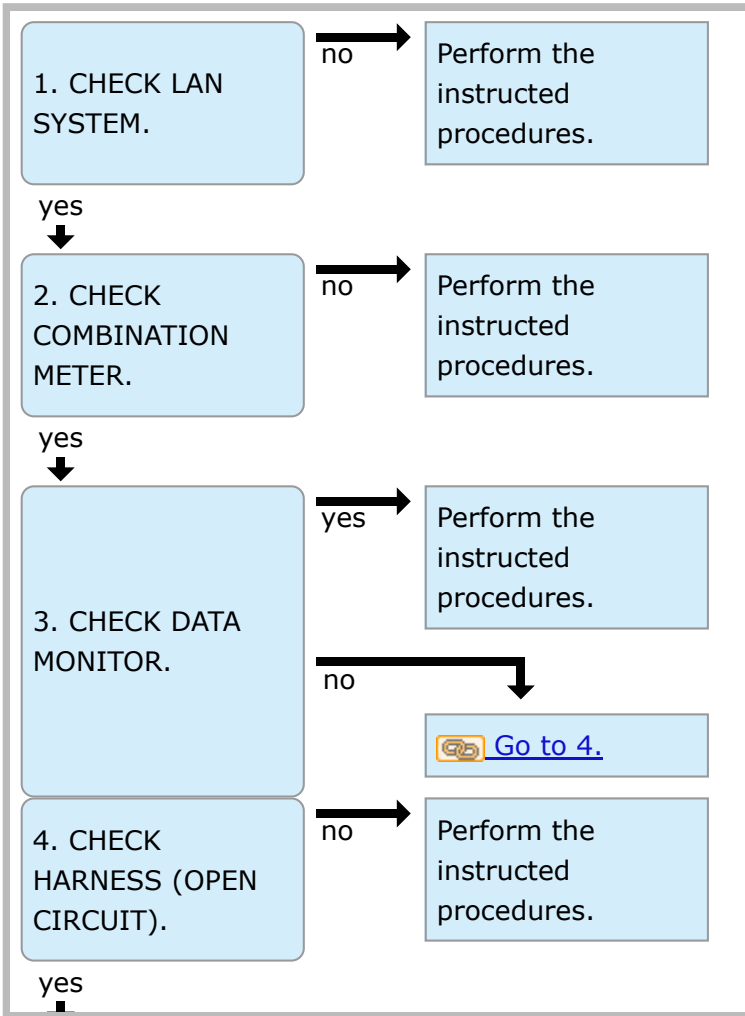
[CAUTION/NOTE](#) [INTRO](#)



KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2282 VEHICLE SPEED SIGNAL CORRELATION

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Push button start system [Ref. to WIRING SYSTEM>Push Button Start System>WIRING](#)

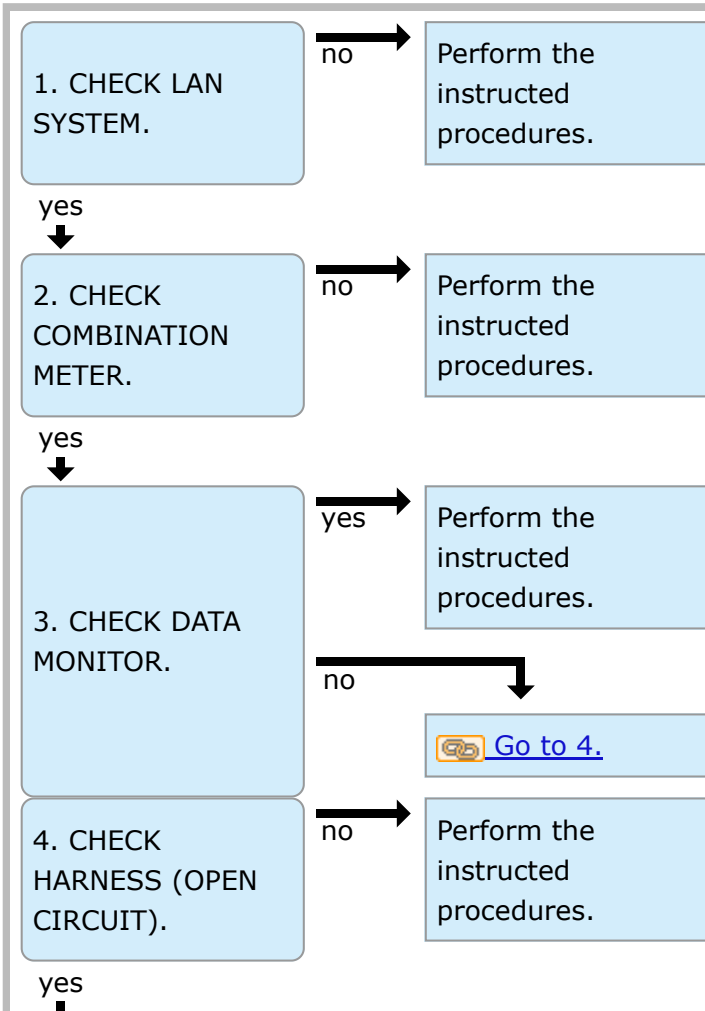
Caution:
 For replacement procedure of keyless access CM, refer to the "REGISTRATION M... IMMOBILIZER" provided as a separate document.

START

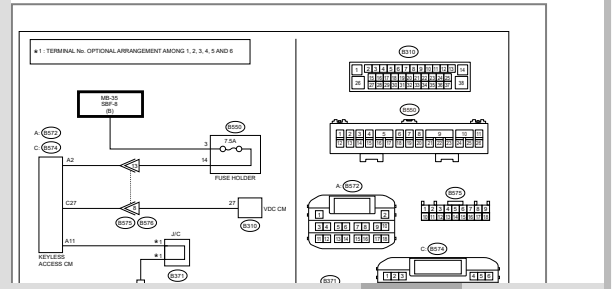
KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2283 VEHICLE SPEED SENSOR

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Push button start system [Ref. to WIRING SYSTEM>Push Button Start System>WIRING](#)



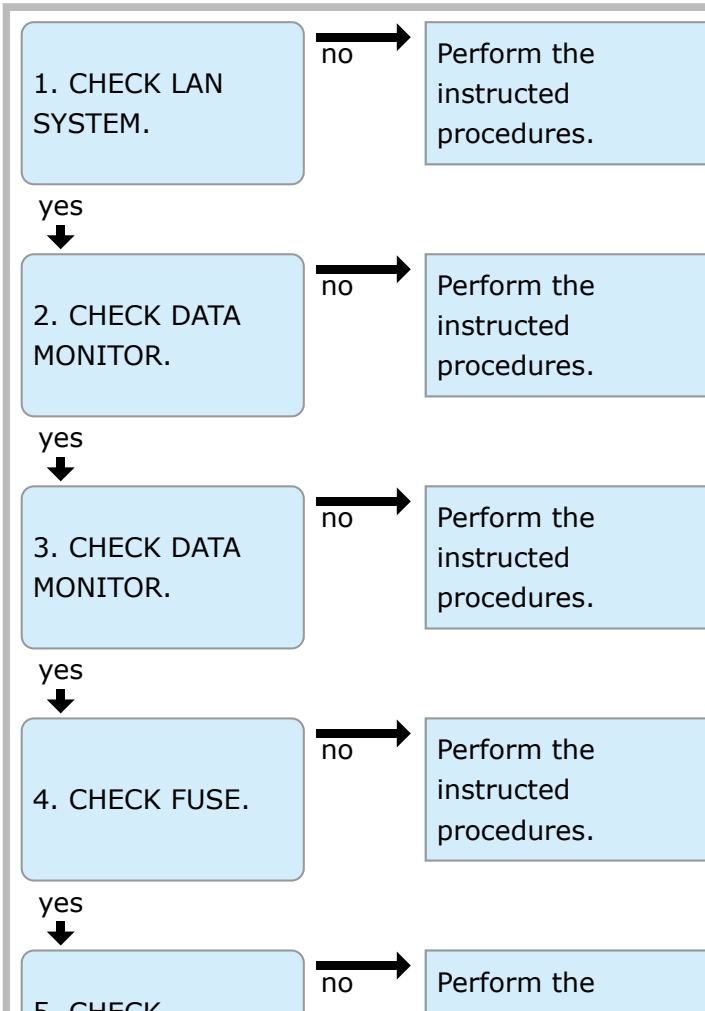
Caution:
 For replacement procedure of keyless access CM, refer to the "REGISTRATION METHOD FOR KEYLESS ACCESS IMMOBILIZER" provided as a separate document.

START

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

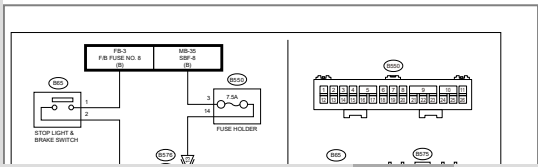
DTC B2284 BRAKE SIGNAL CORRELATION

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

- Push button start system [Ref. to WIRING DIAGRAM>Push Button Start System>WIRING DIAGRAM.](#)
- Stop light system [Ref. to WIRING SYSTEM>Light System>WIRING DIAGRAM.](#)



Caution:

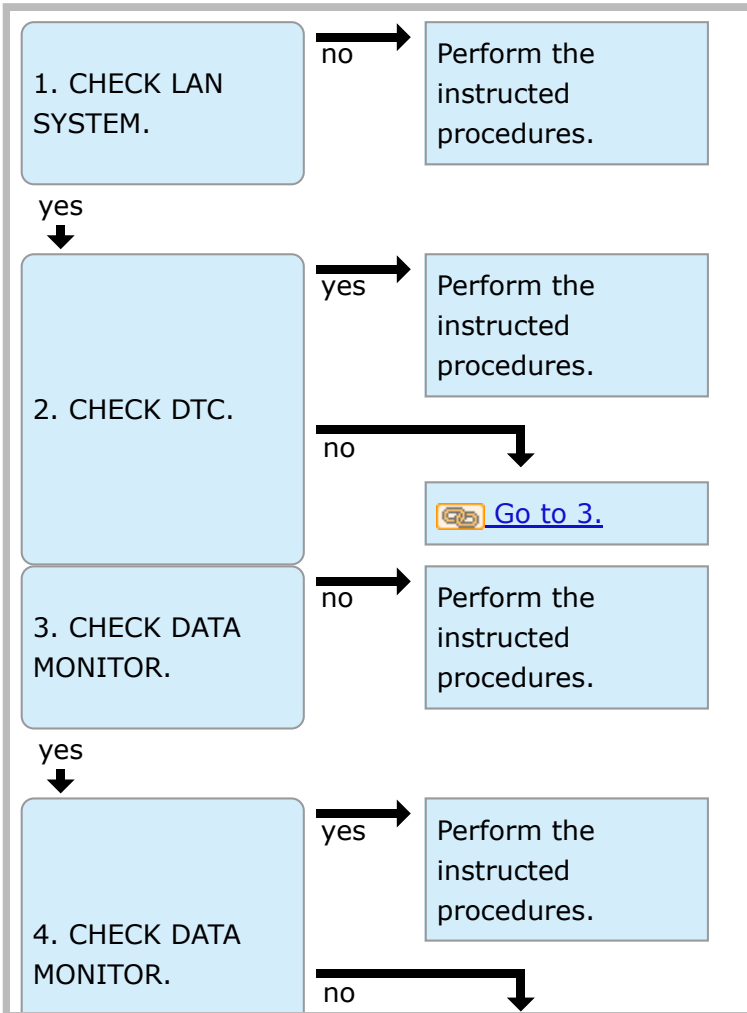
For replacement procedure of keyless entry system (CM), refer to the "REGISTRATION METHOD FOR KEYLESS ENTRY SYSTEM (IMMOBILIZER)" provided as a separate document.

START

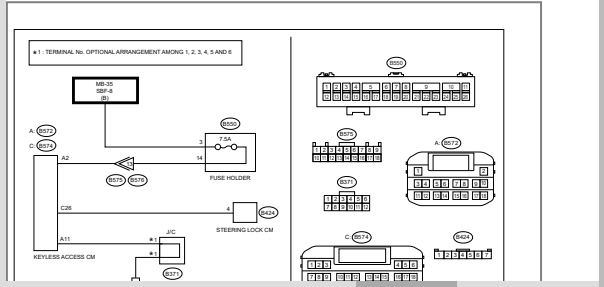
KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2285 STEERING LOCK POSITION SIGNAL CORRELATION

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Push button start system [Ref. to WIRING SYSTEM>Push Button Start System>WIRING](#)



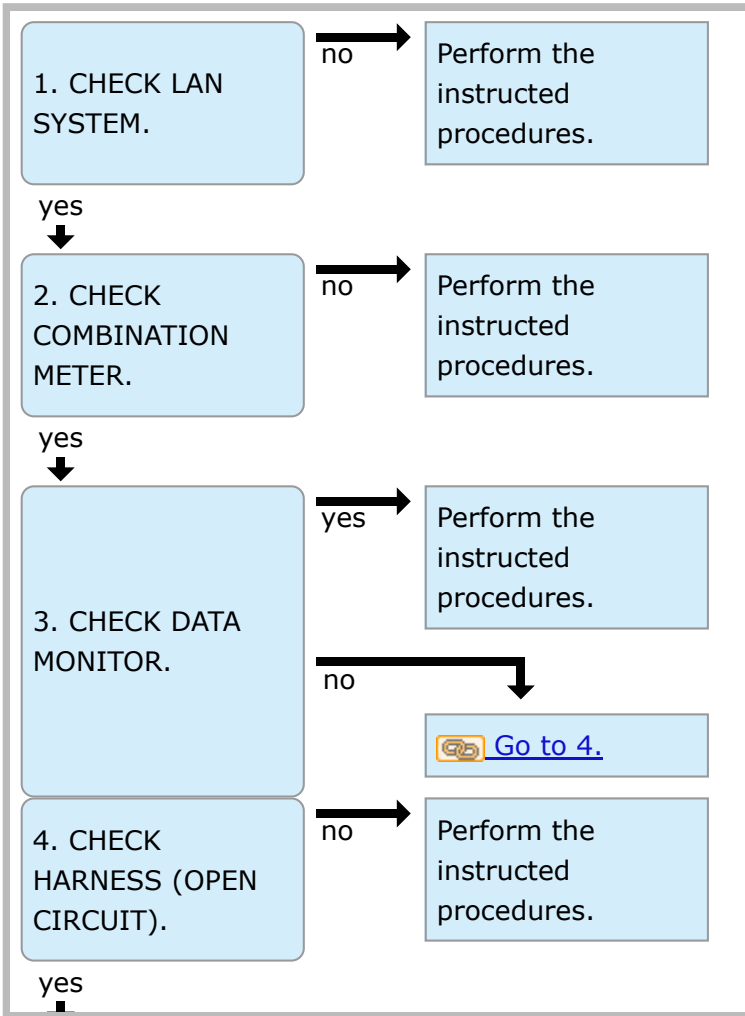
Caution:
 For replacement procedure of keyless access CM, refer to the "REGISTRATION METHOD FOR KEYLESS ACCESS IMMOBILIZER" provided as a separate document.

START

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

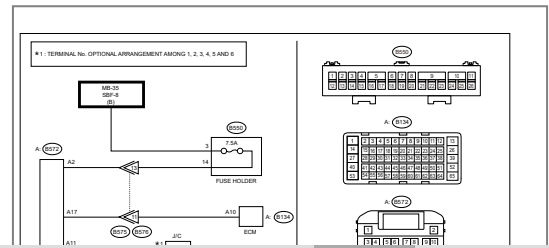
DTC B2286 ENGINE SPEED SIGNAL(WITHOUT AUTO START STOP)

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Push button start system [Ref. to WIRING DIAGRAM SYSTEM>Push Button Start System>WIRING DIAGRAM](#)

- Non-turbo model



Caution:
 For replacement procedure of keyless CM, refer to the "REGISTRATION METHOD FOR KEYLESS IMMOBILIZER" provided as a separate document.



KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2779 REMOTE CONTROL ENGINE STARTER COLLATION

DTC detecting condition:

When the keyless access CM does not respond to engine start even when the remote control engine starter is ON, or when there is a code mismatch.

Trouble symptom:

Remote engine starter does not function.

1. REGISTER THE REMOTE ENGINE STARTER.



1. Clear the DTC. [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Clear memory.](#)
2. Register the remote engine starter using the Subaru Select Monitor. (Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.)
Note:
When the registration failed, refer to "Correspondence table when registration is not possible" in "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.
3. Start the engine using the remote engine starter.
4. Read the DTC again. [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2779 displayed?

Yes

Replace the remote engine starter.

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

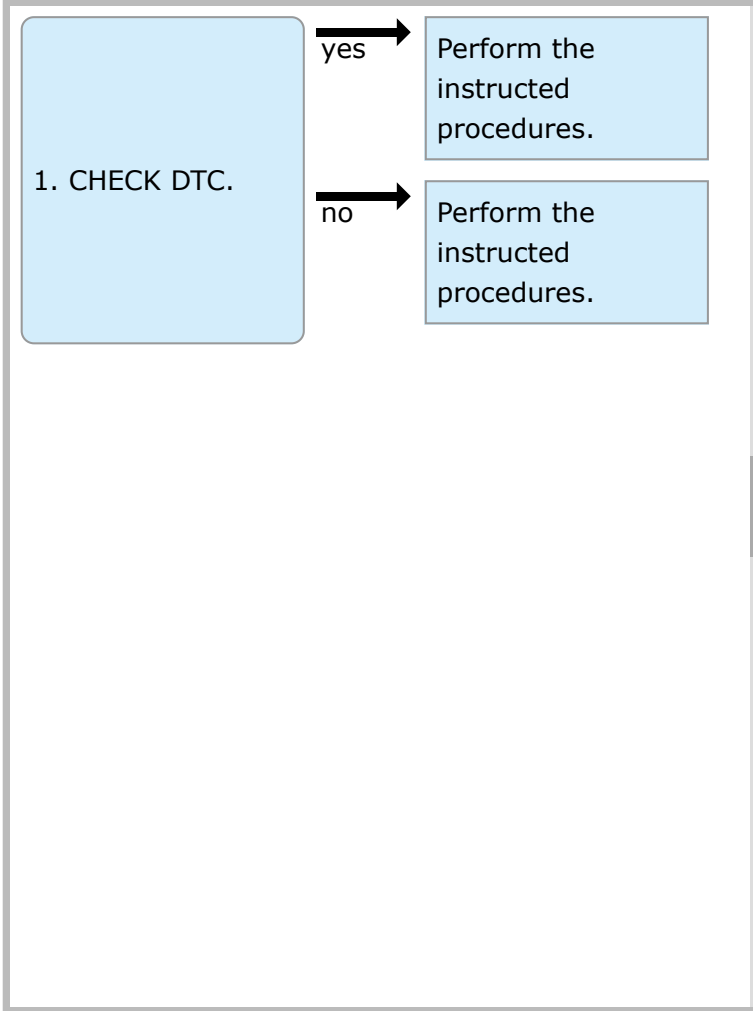
Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2781 STEERING LOCK CM CONTROL CIRCUIT

[CAUTION/NOTE](#) [INTRO](#)



Caution:
For replacement procedure of steering lock CM, refer to the "REGISTRATION MANUAL FOR STEERING LOCK IMMOBILIZER" provided as a separate document.

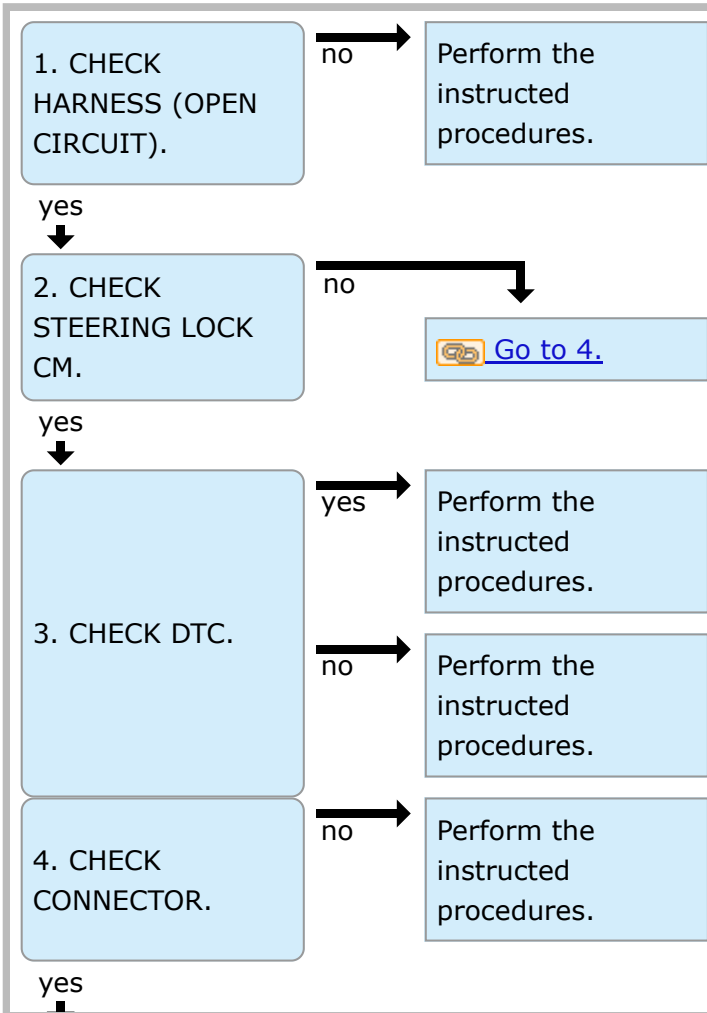
Note:
When all ECMs connected to collision sensor LIN bus cannot communicate with steering lock access CM, DTC B2785 is output.

START

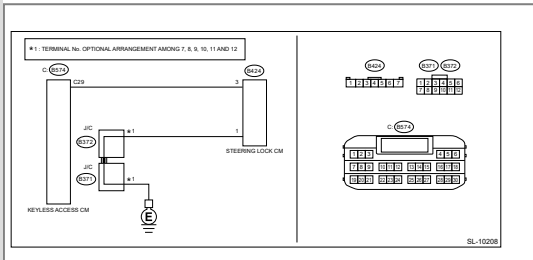
KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2782 STEERING LOCK DRIVE REQUEST SIGNAL CORRELATION

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Push button start system [Ref. to WIRING SYSTEM>Push Button Start System>WIRING](#)



Click the image to see the enlarged image

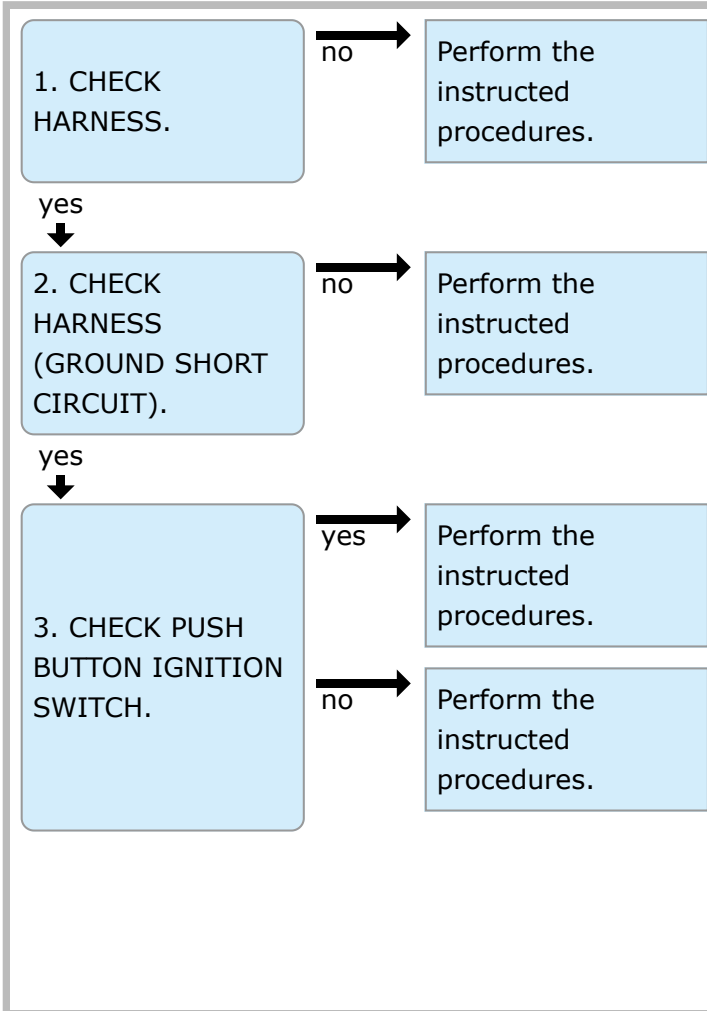
Caution:
 For replacement procedure of keyless access system and steering lock CM, refer to the "REGISTRATION MANUAL FOR IMM" provided as a separate volume.

START

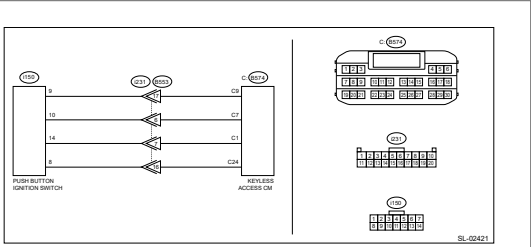
KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2784 ANTENNA CIRCUIT (PUSH ENGINE SWITCH)

CAUTION/NOTE INTRO



Wiring diagram:
Immobilizer system [Ref. to WIRING SYSTEM>Immobilizer System>WIRING DIA](#)



Click the image to see the enlarged image

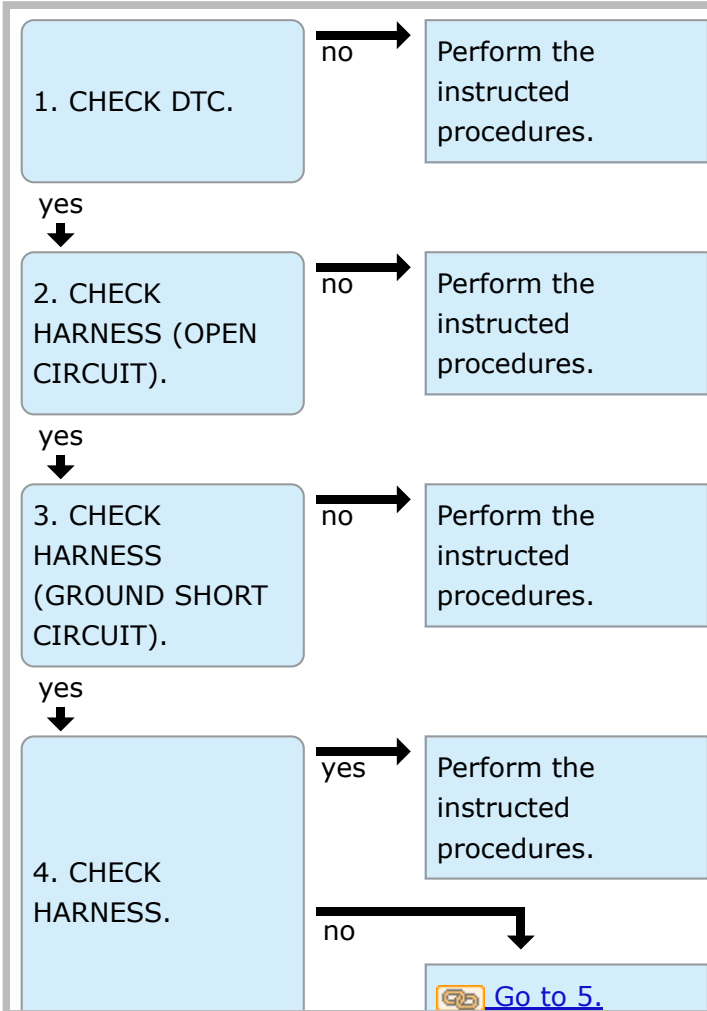
Caution:
For replacement procedure of keyless access and steering lock CM, refer to the "REGISTRATION MANUAL FOR IMM" provided as a separate volume.

START

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

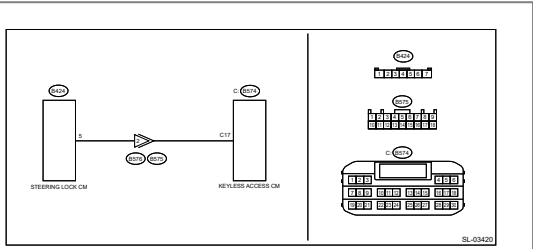
DTC B2785 LIN COMMUNICATION

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

Push button start system [Ref. to WIRING SYSTEM>Push Button Start System>WIRING](#)



Click the image to see the enlarged image

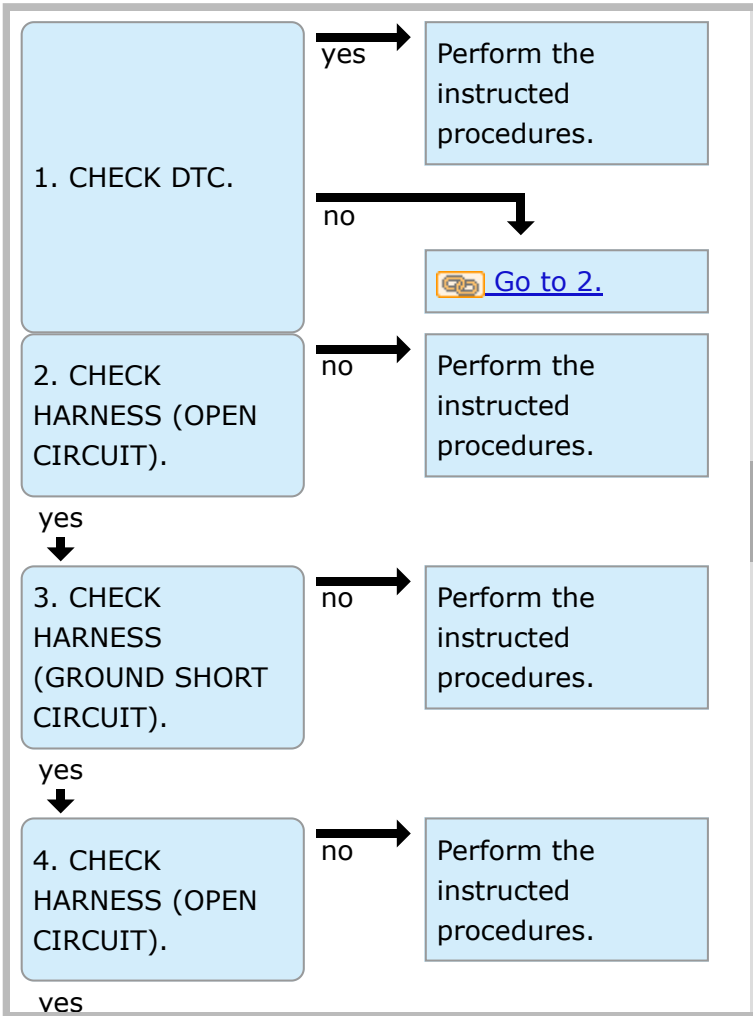
Caution:
For replacement procedure of keyless access and steering lock CM, refer to the "REGISTRATION MANUAL FOR IMM" provided as a separate volume.

START

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2786 STEERING LOCK CM COMMUNICATION

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Push button start system [Ref. to WIRING SYSTEM>Push Button Start System>WIRING](#)

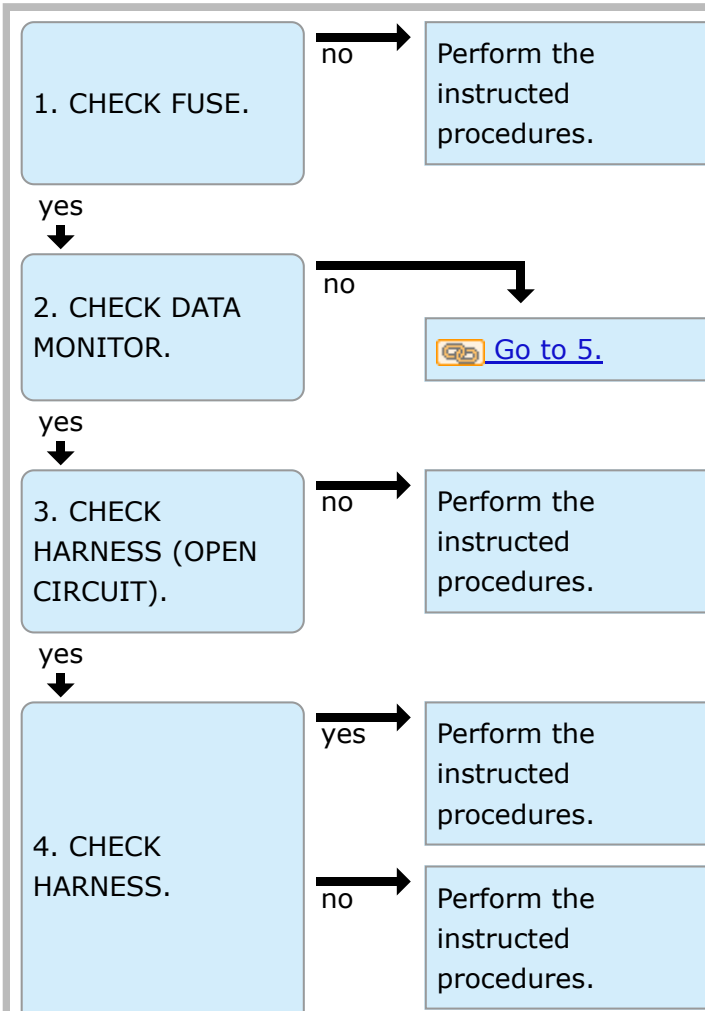
Caution:
 For replacement procedure of keyless access CM and steering lock CM, refer to the "REGISTRATION MANUAL FOR IMM" provided as a separate volume.

START

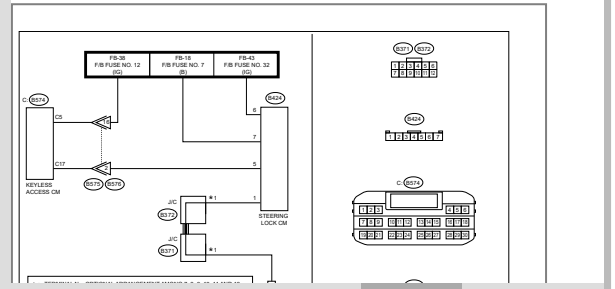
KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2788 IGN SIGNAL CORRELATION (STEERING LOCK CM)

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Push button start system [Ref. to WIRING SYSTEM>Push Button Start System>WIRING](#)



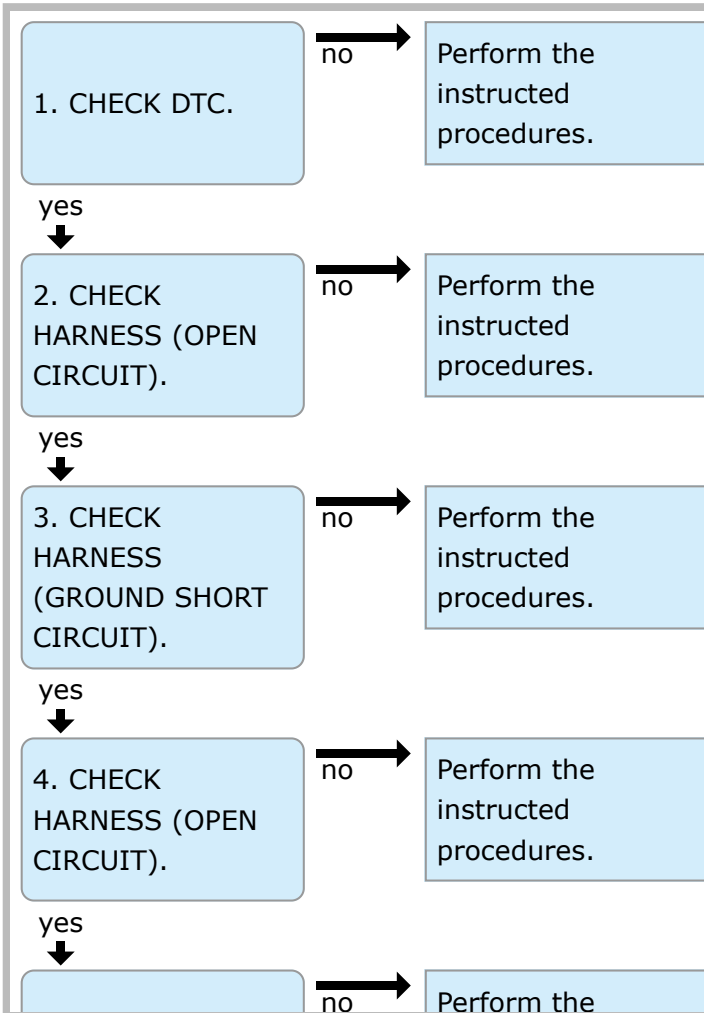
Caution:
 For replacement procedure of steering lock refer to the "REGISTRATION MANUAL IMMOBILIZER" provided as a separate document.

START

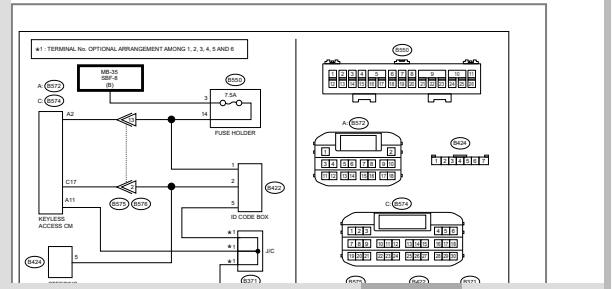
KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2789 ID CODE BOX COMMUNICATION

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Push button start system [Ref. to WIRING SYSTEM>Push Button Start System>WIRING](#)



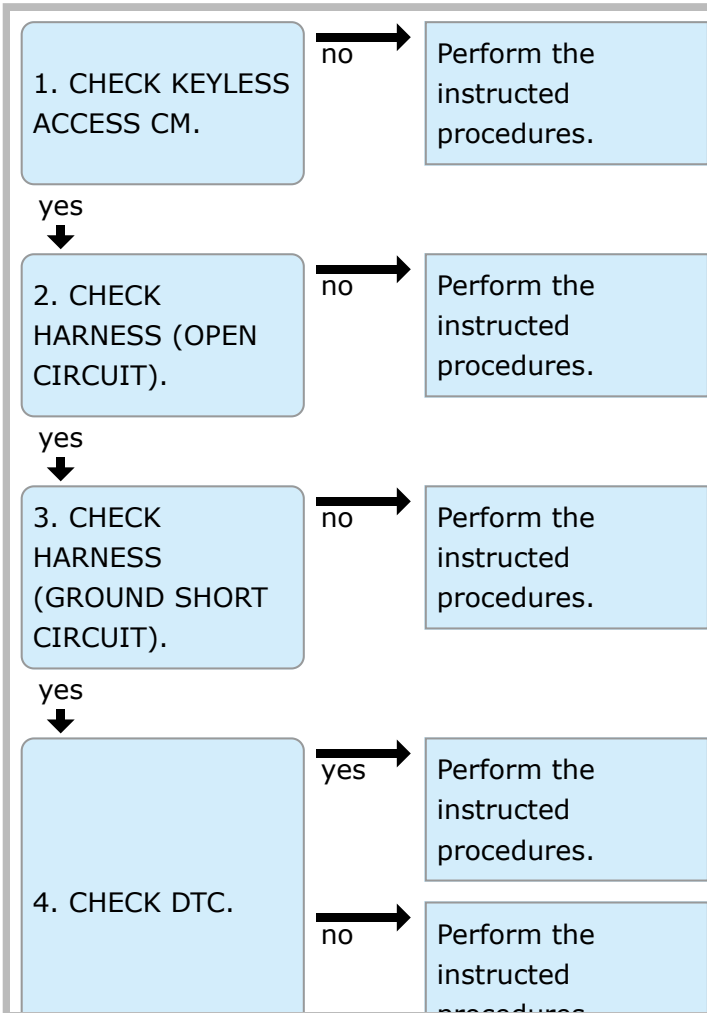
Caution:
 For replacement procedure of keyless access system and ID code box, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided in a separate volume.

START

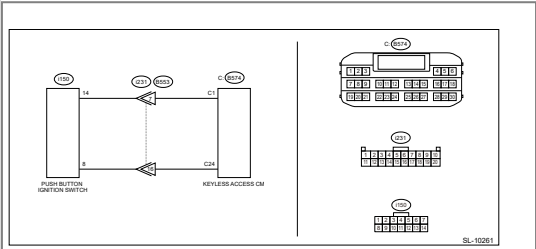
KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B278A PUSH ENGINE SWITCH POWER SUPPLY CIRCUIT

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Immobilizer system [Ref. to WIRING SYSTEM>Immobilizer System>WIRING DIA](#)



Click the image to see the enlarged image

Caution:
 For replacement procedure of keyless access CM, refer to the "REGISTRATION METHOD FOR KEYLESS ACCESS CM" provided as a separate document.

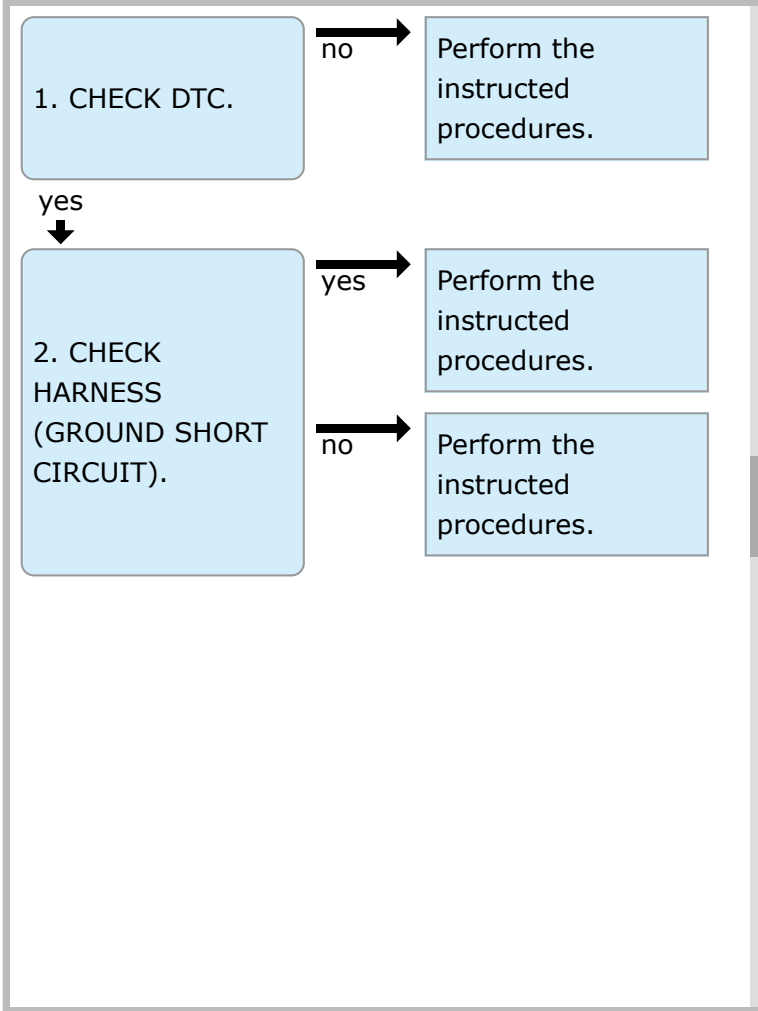
START

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B278D ID CODE BOX JUDGMENT CIRCUIT

CAUTION/NOTE

INTRO



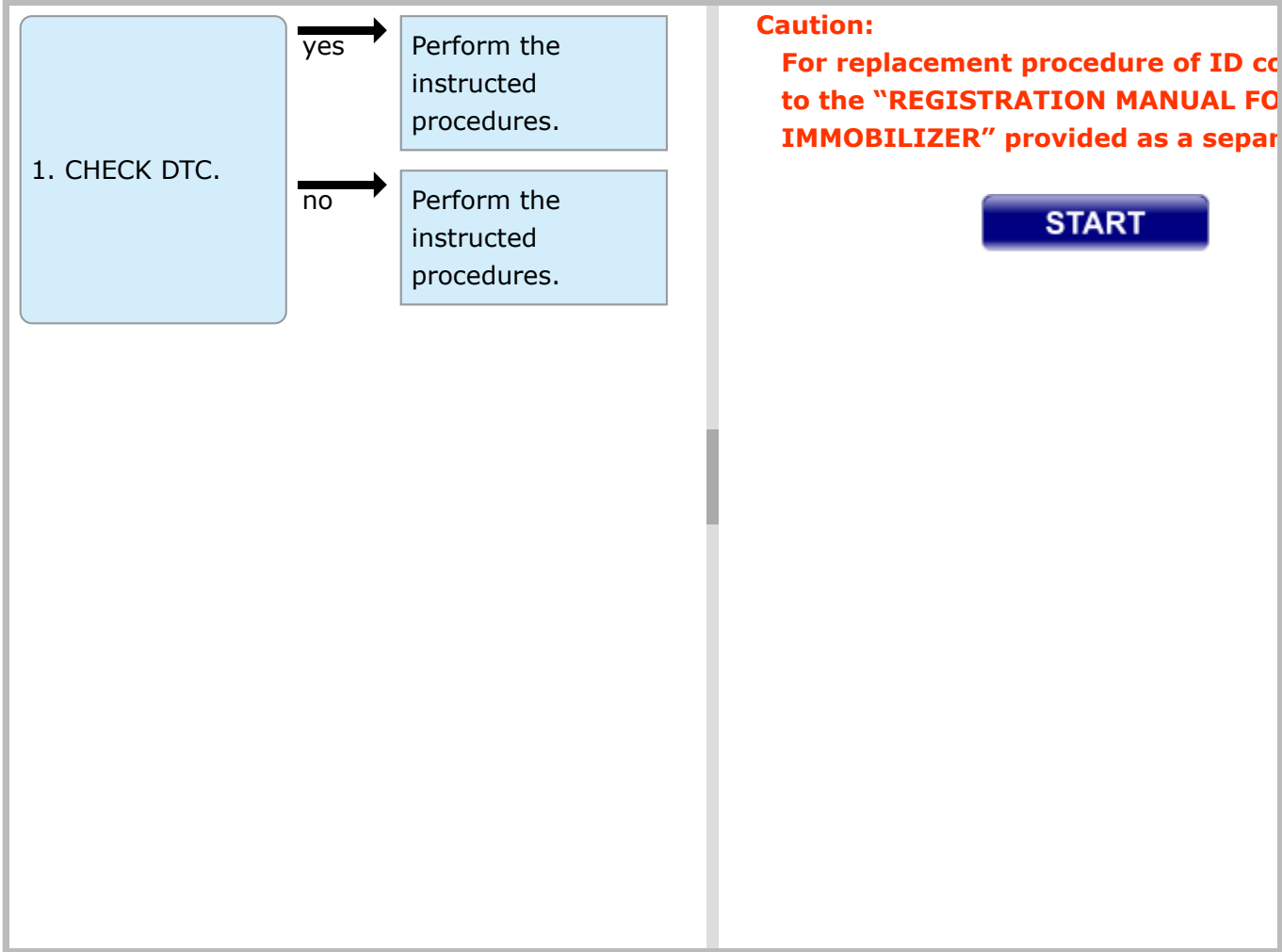
Caution:
For replacement procedure of keyless entry system (CM), refer to the "REGISTRATION M... IMMOBILIZER" provided as a separate document.

START

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2790 ID CODE BOX CIRCUIT

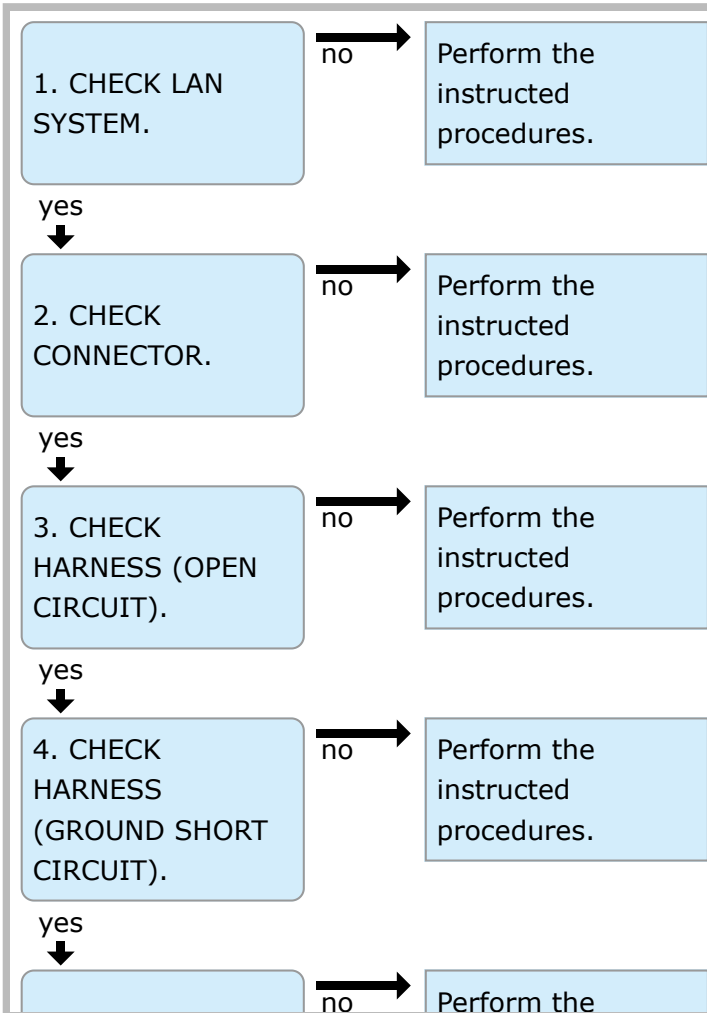
[CAUTION/NOTE](#) [INTRO](#)



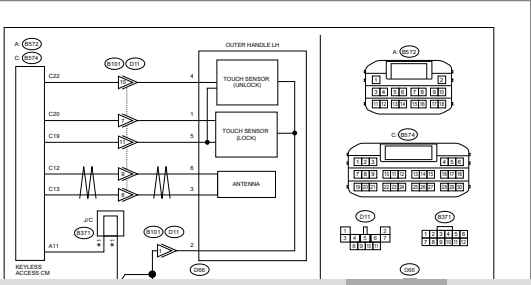
KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B27A1 DRIVER SIDE EXTERNAL ANTENNA OPEN

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Keyless access system [Ref. to WIRING SYSTEM>Keyless Access System>WIRING D](#)



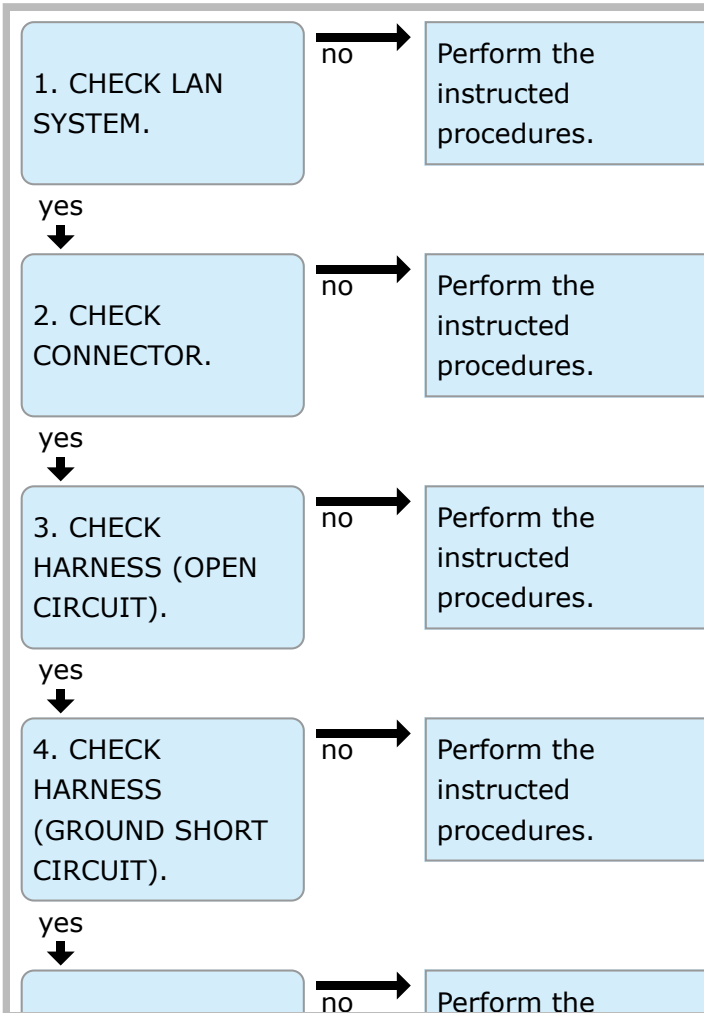
Caution:
 For replacement procedure of keyless access system (CM), refer to the "REGISTRATION METHOD FOR KEYLESS ACCESS SYSTEM" and "IMMOBILIZER" provided as a separate document.

START

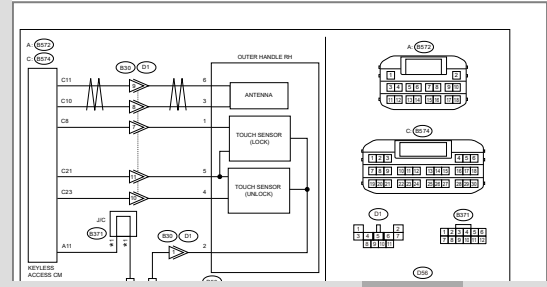
KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B27A2 PASSENGER SIDE EXTERNAL ANTENNA OPEN

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Keyless access system [Ref. to WIRING SYSTEM>Keyless Access System>WIRING D](#)



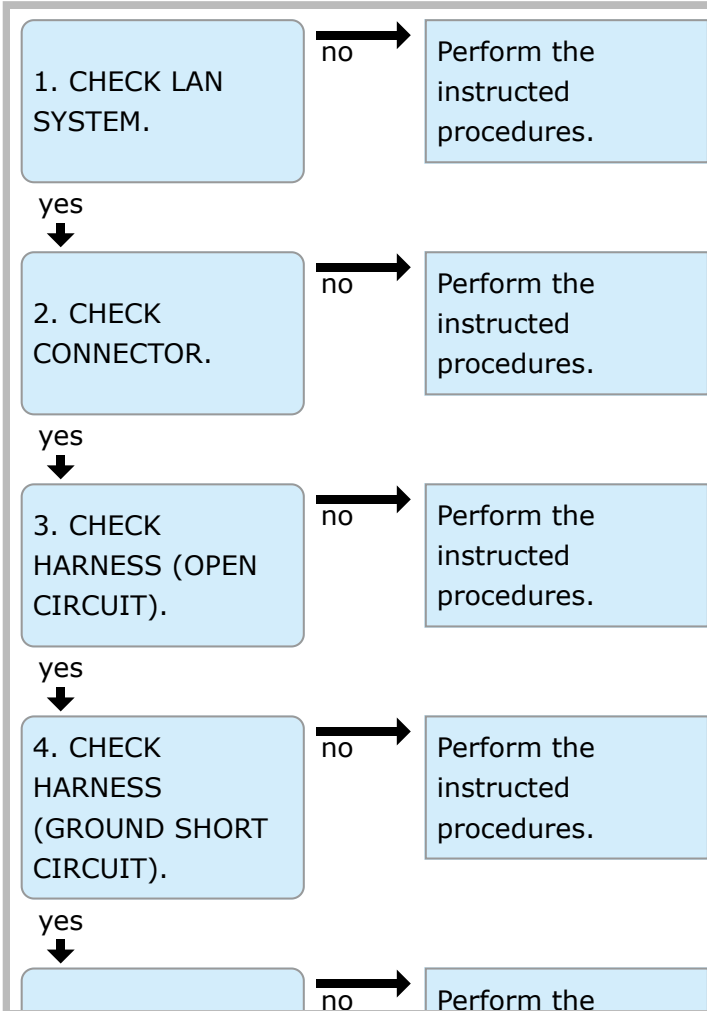
Caution:
 For replacement procedure of keyless access system (CM), refer to the "REGISTRATION METHOD FOR KEYLESS ACCESS SYSTEM" and "REGISTRATION METHOD FOR KEYLESS ACCESS SYSTEM IMMOBILIZER" provided as a separate document.

START

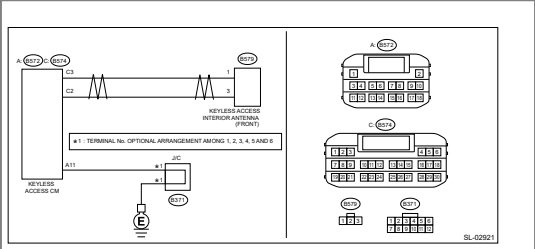
KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B27A5 FRONT INTERNAL ANTENNA OPEN

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Keyless access system [Ref. to WIRING SYSTEM>Keyless Access System>WIRING D](#)



Click the image to see the enlarged image

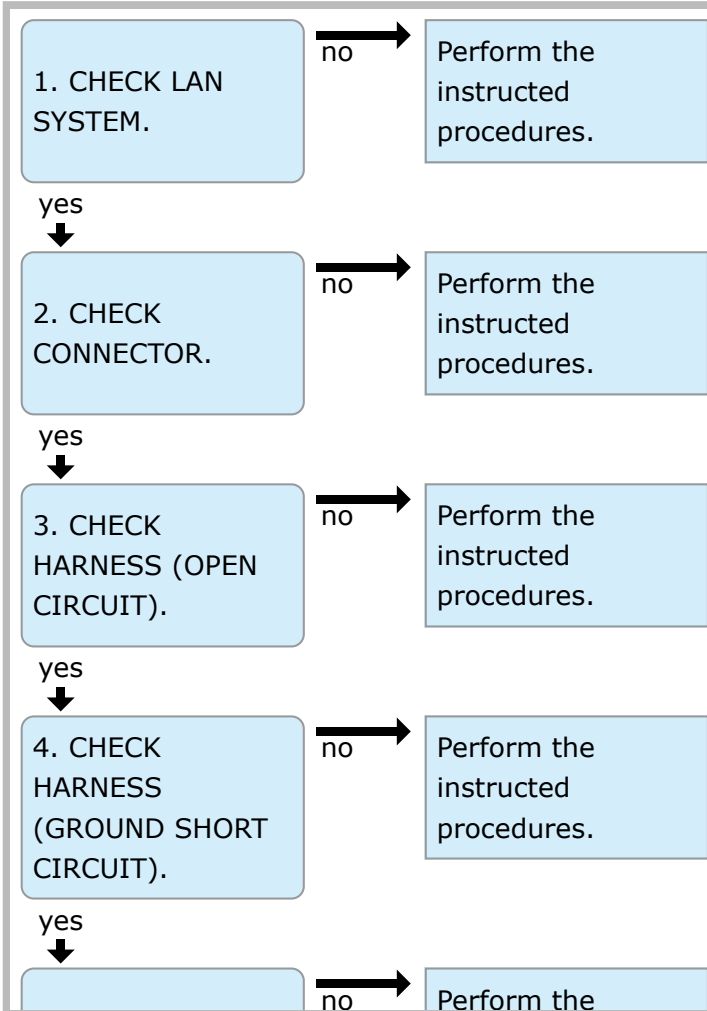
Caution:
 For replacement procedure of keyless access system CM, refer to the "REGISTRATION METHOD FOR KEYLESS ACCESS SYSTEM WITH IMMOBILIZER" provided as a separate document.

START

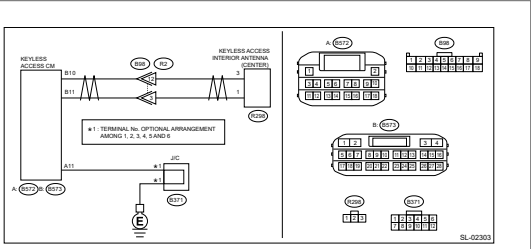
KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B27A6 REAR INTERNAL ANTENNA OPEN

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Keyless access system [Ref. to WIRING SYSTEM>Keyless Access System>WIRING D](#)



Click the image to see the enlarged image

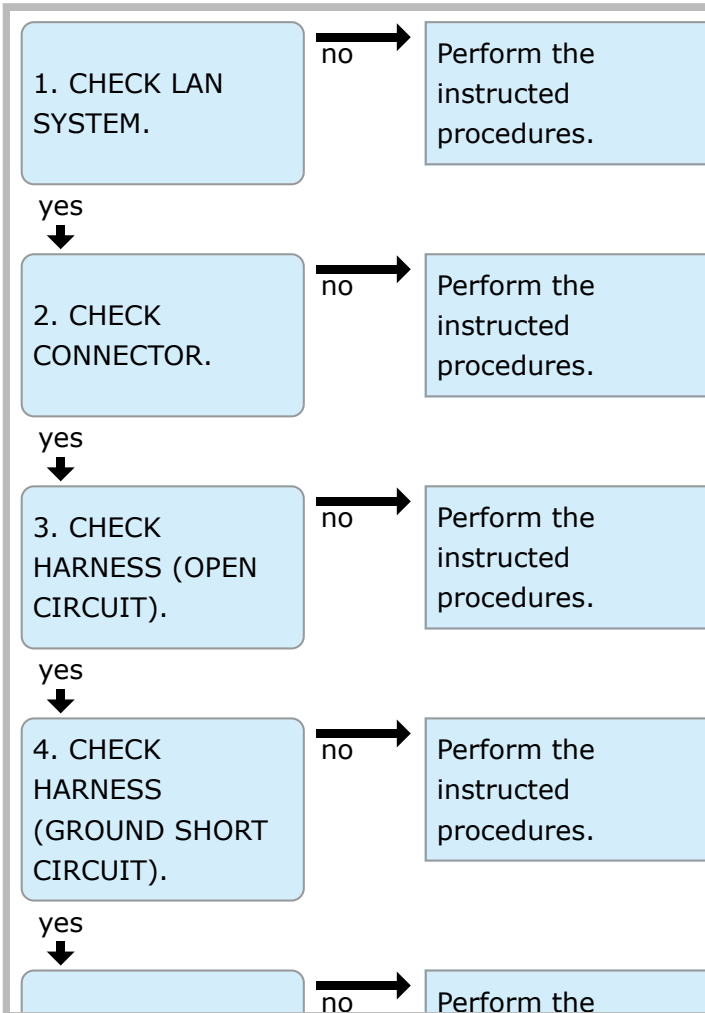
Caution:
 For replacement procedure of keyless access system, refer to the "REGISTRATION METHOD FOR KEYLESS ACCESS SYSTEM" and "IMMOBILIZER" provided as a separate document.

START

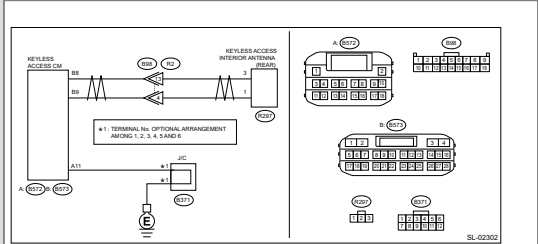
KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B27A7 TRUNK/REAR GATE INTERNAL ANTENNA OPEN

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Keyless access system [Ref. to WIRING SYSTEM>Keyless Access System>WIRING D](#)



Click the image to see the enlarged image

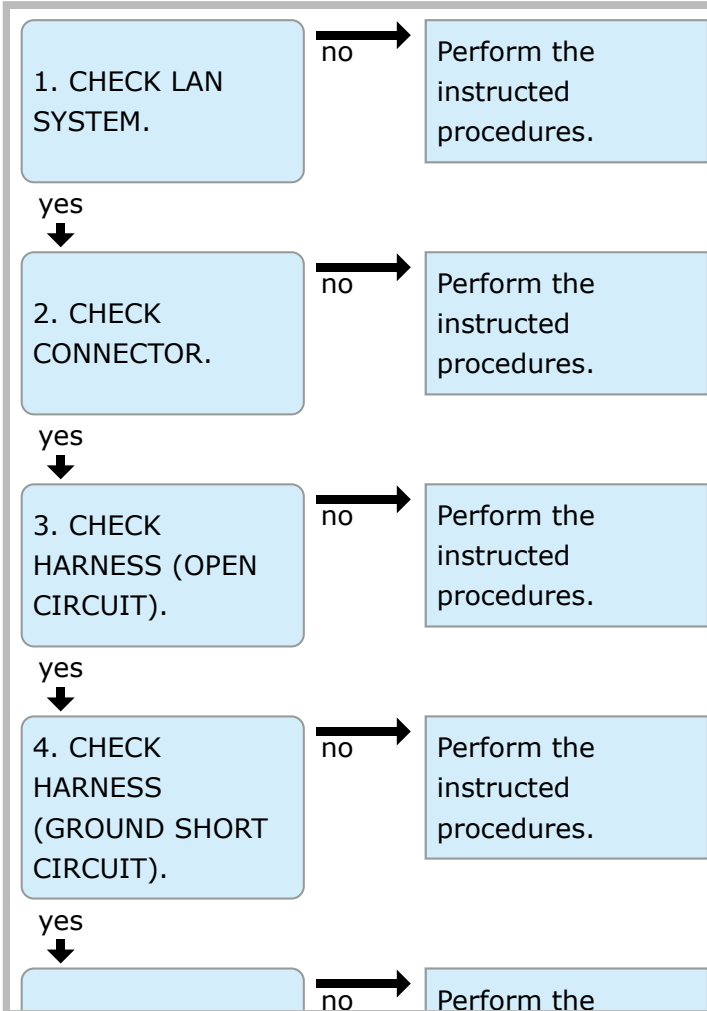
Caution:
For replacement procedure of keyless access system (CM), refer to the "REGISTRATION METHOD FOR KEYLESS ACCESS SYSTEM" and "IMMOBILIZER" provided as a separate document.

START

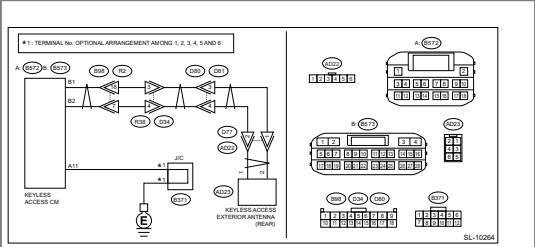
KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B27A8 TRUNK/REAR GATE EXTERNAL ANTENNA OPEN

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Keyless access system [Ref. to WIRING SYSTEM>Keyless Access System>WIRING D](#)



Click the image to see the enlarged image

Caution:
 For replacement procedure of keyless access system (CM), refer to the "REGISTRATION METHOD FOR THE IMMOBILIZER" provided as a separate document.


START

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure
with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

Detected when CAN line abnormality is detected.

Note:


**Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM
(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.**

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

Detected when CAN data from the engine control module (ECM) does not arrive.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM

Detected when CAN data from TCM does not arrive.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure
with Diagnostic Trouble Code (DTC)

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE

Detected when CAN data from BIU does not arrive.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM
\(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"

Detected when there is malfunction in CAN data from the engine control module (ECM).

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE

Detected when CAN data from BIU is abnormal.

Note:

Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Keyless Access with Push Button Start], and then select [Enter].
5. On [Select Function] display, select [DTC].

Note:

- For detailed operation procedures, refer to "Application help".
- For details concerning DTC, refer to List of Diagnostic Trouble Code (DTC).

 [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

INSPECTION

1. KEYLESS ACCESS LOCK/UNLOCK CANNOT BE PERFORMED FROM ANY OF THE DOORS

Caution:

- Check that there are no other registered access keys inside the vehicle.
- Inspect LAN system according to the basic diagnostic procedure, and make sure that there is no fault.
- Check that the keyless access function is not stopped.
- When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK OPERATION OF KEYLESS DOOR LOCK.



Using the keyless function of the access key, check the operation of the door lock.

Does it lock/unlock normally?

Yes

Check the exterior antenna, oscillator, touch sensor, lock/unlock buttons.

No

[Go to 2.](#)

2. CHECK ACCESS KEY.



Check for whether lock and unlock is possible with the registered access key.

Is there any access key which can lock/unlock when the touch sensor is operated?

Yes

Check the access key that does not operate. [Go to 3.](#)

No

[Go to 4.](#)

3. CHECK ACCESS KEY.



Measure the battery voltage of the access key that does not operate.

Is the voltage 2.5 — 3.2 V?



Yes Replace the access key.


No Replace the battery.

4. CHECK DOOR LOCK.

Operate the driver's center door lock switch.

Does the door lock operate?

Yes  [Go to 5.](#)

No Check the door lock control system.  [Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION.](#)

5. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the receiver connector (R296).
2. Using a tester, measure the resistance between receiver and chassis ground.

Connector & terminal

(R296) No. 1 — Chassis ground:

Is the resistance less than 10 Ω ?

Yes  [Go to 6.](#)

No Repair or replace the open circuit of harness.

6. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector.
2. Using a tester, measure the resistance between receiver and keyless access CM.

Connector & terminal

(R296) No. 4 — (B573) No. 5:

(R296) No. 5 — (B573) No. 17:

(R296) No. 2 — (B573) No. 19:

Is the resistance less than 10 Ω ?

Yes  [Go to 7.](#)

No

Repair or replace the open circuit of harness.

7. CHECK RECEIVER.



Replace with a receiver that is operating normally. [Ref. to SECURITY AND LOCKS>Receiver>REMOVAL.](#)

When the front unlock sensor and the rear gate opener button are operated, does it lock/unlock?

Yes

Malfunction occurred in receiver.

No

[Go to 8.](#)

8. CHECK HARNESS.



Using a tester, measure the voltage between the keyless access CM connector and chassis ground.

Connector & terminal

(B572) No. 2 (+) — Chassis ground (-):

Is the voltage 10 V or more when the ignition switch is turned to ON?

Yes

[Go to 9.](#)

No

Check the keyless access CM power supply circuit.

9. CHECK HARNESS (OPEN CIRCUIT).



Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(B572) No. 11 — Chassis ground:

Is the resistance less than 10 Ω ?

Yes

Replace the keyless access CM. [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

No

Repair or replace the open circuit of harness.

2. CANNOT LOCK WITH KEYLESS ACCESS FROM THE DRIVER'S DOOR

Caution:

- Check that there are no other registered access keys inside the vehicle.
- Inspect LAN system according to the basic diagnostic procedure, and make sure that there is no fault.
- Check that the keyless access function is not stopped.
- When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK DOOR LOCK SWITCH.


Check that the lock/unlock operates with the driver's door lock switch.

Does it lock/unlock normally?


Yes

 [Go to 2.](#)

No

Check the door lock circuit.  [Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > SYMPTOM CHART.](#)

2. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, display the data monitor [Driver's seat lock status SW input] of Body Control.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Data Monitor.](#)
2. Read the data when locking/unlocking the driver's side lock actuator.

Does the data change from ON/OFF?


Yes

 [Go to 3.](#)Keyless Access & Start Link 1 Memorized

No

Check the door lock switch circuit.

3. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, display the data monitor [Driver's lock touch sensor SW] of [Keyless Access with Push Button Start].  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Data Monitor.](#)
2. Read the data when operating the touch sensor (lock) of the door outer handle.


Does the data change from ON/OFF according to the sensor operation?

 Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless](#)

Yes

[Access CM>REMOVAL.](#)

No

 [Go to 4.](#)

4. CHECK HARNESS (OPEN CIRCUIT).



1. Disconnect the keyless access CM connector.
2. Disconnect the front outer handle connector.
3. Using a tester, measure the resistance between the keyless access CM connector and front outer handle connector.

Connector & terminal

(B574) No. 20 — (D66) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 5.](#)

No

Repair or replace the open circuit of harness.

5. CHECK HARNESS (GROUND SHORT CIRCUIT).



Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(B574) No. 20 — Chassis ground:

(D66) No. 1 — Chassis ground:

Is the resistance 10 k Ω or more?

Yes


 [Go to 6.](#)

No

Repair or replace the short circuit of the harness.


6. REPLACE FRONT DOOR OUTER HANDLE.



Replace the driver's side front outer handle with the passenger's side front outer handle.  [Ref. to SECURITY AND LOCKS>Front Outer Handle>REMOVAL.](#)


Does it operate properly?

Yes

Replace the driver's front outer handle.  [Ref. to SECURITY AND](#)

[LOCKS>Front Outer Handle>REMOVAL.](#)

No

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

3. CANNOT LOCK/UNLOCK WITH KEYLESS ACCESS FROM THE DRIVER'S DOOR

Caution:

- Check that there are no other registered access keys inside the vehicle.
- Inspect LAN system according to the basic diagnostic procedure, and make sure that there is no fault.
- Check that the keyless access function is not stopped.
- When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK DOOR LOCK SWITCH.


Check that the lock/unlock operates with the driver's door lock switch.

Does it lock/unlock normally?

Yes

 [Go to 2.](#)

No

Check the door lock circuit.  [Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > SYMPTOM CHART.](#)

2. CHECK FUSE.

Check the fuse.  [Ref. to SECURITY AND LOCKS>Relay and Fuse.](#)

Is the check result OK?

Yes

 [Go to 3.](#)

No

Replace the fuse.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector.
2. Disconnect the front outer handle connector.
3. Using a tester, measure the resistance between the keyless access CM connector and front outer handle connector, and between front outer handle connector and chassis

ground.

Connector & terminal

- (B574) No. 12 — (D66) No. 6:
- (B574) No. 13 — (D66) No. 3:
- (B574) No. 19 — (D66) No. 5:
- (D66) No. 2 — Chassis ground:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Repair or replace the open circuit of harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).



Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

- (B574) No. 12 — Chassis ground:
- (D66) No. 6 — Chassis ground:
- (B574) No. 13 — Chassis ground:
- (D66) No. 3 — Chassis ground:

Is the resistance 10 k Ω or more?

Yes

 [Go to 5.](#)

No

Repair or replace the short circuit of the harness.

5. CHECK KEYLESS ACCESS CM.



1. Connect the keyless access CM connector.
2. Turn the ignition switch to OFF, close all doors and take the access key out of passenger room.
3. Using the Subaru Select Monitor, measure the waveform between the front outer handle connector.

Connector & terminal


- (D66) No. 6 — (D66) No. 3:

Does pulse output change from pulse output OFF → pulse output ON by the lock operation using access key?


Yes

 [Go to 6.](#)

No


Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

6. REPLACE FRONT DOOR OUTER HANDLE.


Replace the driver's side front outer handle with the passenger's side front outer handle.  [Ref. to SECURITY AND LOCKS>Front Outer Handle>REMOVAL.](#)

Does it operate properly?

Yes

Replace the driver's front outer handle.  [Ref. to SECURITY AND LOCKS>Front Outer Handle>REMOVAL.](#)

No

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

4. CANNOT UNLOCK WITH KEYLESS ACCESS FROM THE DRIVER'S DOOR

Caution:

- Check that there are no other registered access keys inside the vehicle.
- Inspect LAN system according to the basic diagnostic procedure, and make sure that there is no fault.
- Check that the keyless access function is not stopped.
- When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK DOOR LOCK SWITCH.


Check that the lock/unlock operates with the driver's door lock switch.

Does it lock/unlock normally?


Yes

 [Go to 2.](#)

No

Check the door lock circuit.  [Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > SYMPTOM CHART.](#)

2. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, display the data monitor [Driver's seat lock status SW input] of [Body Control].  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Data Monitor.](#)
2. Read the data when locking/unlocking the driver's side lock actuator.

Does the data change from ON/OFF?


Yes

 [Go to 3.](#)

No

Check the door lock switch circuit.

3. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, display the data monitor [Driver's unlock touch sensor switch] of [Keyless Access with Push Button Start].  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Data Monitor.](#)
2. Read the data when operating the touch sensor (unlock) of the door outer handle.

Does the data change from ON/OFF according to the sensor operation?

Yes

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

No

 [Go to 4.](#)

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector.
2. Disconnect the front outer handle connector.
3. Using a tester, measure the resistance between the keyless access CM connector and front outer handle connector.

Connector & terminal

(B574) No. 22 — (D66) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 5.](#)

No

Repair or replace the open circuit of harness.

5. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.


Connector & terminal

(B574) No. 22 — Chassis ground:

(D66) No. 4 — Chassis ground:

Is the resistance 10 kΩ or more?


Yes

 [Go to 6.](#)

No


Repair or replace the short circuit of the harness.

6. REPLACE FRONT DOOR OUTER HANDLE.


Replace the driver's side front outer handle with the passenger's side front outer handle. 
[Ref. to SECURITY AND LOCKS>Front Outer Handle>REMOVAL.](#)

Does it operate properly?

Yes

Replace the driver's front outer handle.  [Ref. to SECURITY AND LOCKS>Front Outer Handle>REMOVAL.](#)

No

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

5. CANNOT LOCK WITH KEYLESS ACCESS FROM THE PASSENGER'S DOOR

Caution:

- Check that there are no other registered access keys inside the vehicle.
- Inspect LAN system according to the basic diagnostic procedure, and make sure that there is no fault.
- Check that the keyless access function is not stopped.
- When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK DOOR LOCK SWITCH.


Check that the lock/unlock operates with the driver's door lock switch.

Does it lock/unlock normally?

Yes

 [Go to 2.](#)

No

Check the door lock circuit.  [Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > SYMPTOM CHART.](#)

2. CHECK DATA MONITOR.



1. Using the Subaru Select Monitor, display the data monitor [Passenger's seat lock status SW input] of [Body Control]. [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Data Monitor.](#)
2. Read the data when locking/unlocking the passenger's side lock actuator.

Does the data change from ON/OFF?

Yes

[Go to 3.](#)

No

Check the door lock switch circuit.

3. CHECK DATA MONITOR.



1. Using the Subaru Select Monitor, display the data monitor [Passenger's lock touch sensor SW] of [Keyless Access with Push Button Start]. [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Data Monitor.](#)
2. Read the data when operating the touch sensor (lock) of the door outer handle.

Does the data change from ON/OFF according to the sensor operation?

Yes

Replace the keyless access CM. [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

No

[Go to 4.](#)

4. CHECK HARNESS (OPEN CIRCUIT).



1. Disconnect the keyless access CM connector.
2. Disconnect the front outer handle connector.
3. Using a tester, measure the resistance between the keyless access CM connector and front outer handle connector.

Connector & terminal

(B574) No. 8 — (D56) No. 1:

Is the resistance less than 1 Ω?

Yes

[Go to 5.](#)

No

Repair or replace the open circuit of harness.

5. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(B574) No. 8 — Chassis ground:

(D56) No. 1 — Chassis ground:

Is the resistance 10 kΩ or more?


Yes

 [Go to 6.](#)

No


Repair or replace the short circuit of the harness.

6. REPLACE FRONT DOOR OUTER HANDLE.

Replace the passenger's side front outer handle with the driver's side front outer handle.  [Ref. to SECURITY AND LOCKS>Front Outer Handle>REMOVAL.](#)

Does it operate properly?

Yes

Replace the passenger's front outer handle.  [Ref. to SECURITY AND LOCKS>Front Outer Handle>REMOVAL.](#)

No

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

6. CANNOT LOCK/UNLOCK WITH KEYLESS ACCESS FROM THE PASSENGER'S DOOR

Caution:

- Check that there are no other registered access keys inside the vehicle.
- Inspect LAN system according to the basic diagnostic procedure, and make sure that there is no fault.
- Check that the keyless access function is not stopped.
- When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK DOOR LOCK SWITCH.


Check that the lock/unlock operates with the driver's door lock switch.

Does it lock/unlock normally?

Yes

 [Go to 2.](#)

No

Check the door lock circuit.  [Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > SYMPTOM CHART.](#)

2. CHECK FUSE.



Check the fuse.  [Ref. to SECURITY AND LOCKS>Relay and Fuse.](#)

Is the check result OK?

Yes

 [Go to 3.](#)

No

Replace the fuse.

3. CHECK HARNESS (OPEN CIRCUIT).



1. Disconnect the keyless access CM connector.
2. Disconnect the front outer handle connector.
3. Using a tester, measure the resistance between the keyless access CM connector and front outer handle connector, and between front outer handle connector and chassis ground.

Connector & terminal

- (B574) No. 11 — (D56) No. 6:
- (B574) No. 10 — (D56) No. 3:
- (B574) No. 23 — (D56) No. 4:
- (D56) No. 2 — Chassis ground:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Repair or replace the open circuit of harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).



Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

- (B574) No. 11 — Chassis ground:
- (D56) No. 6 — Chassis ground:

(B574) No. 10 — Chassis ground:

(D56) No. 3 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes

 [Go to 5.](#)

No

Repair or replace the short circuit of the harness.

5. CHECK KEYLESS ACCESS CM.

1. Connect the keyless access CM connector.
2. Turn the ignition switch to OFF, close all doors and take the access key out of passenger room.
3. Using the Subaru Select Monitor, measure the waveform between the front outer handle connector.

Connector & terminal


(D56) No. 6 — (D56) No. 3:

Does pulse output change from pulse output OFF → pulse output ON by the lock operation using access key?


Yes

 [Go to 6.](#)

No


Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

6. REPLACE FRONT DOOR OUTER HANDLE.


Replace the passenger's side front outer handle with the driver's side front outer handle.  [Ref. to SECURITY AND LOCKS>Front Outer Handle>REMOVAL.](#)

Does it operate properly?

Yes

Replace the passenger's front outer handle.  [Ref. to SECURITY AND LOCKS>Front Outer Handle>REMOVAL.](#)

No

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

7. CANNOT UNLOCK WITH KEYLESS ACCESS FROM THE PASSENGER'S DOOR

Caution:


- Check that there are no other registered access keys inside the vehicle.
- Inspect LAN system according to the basic diagnostic procedure, and make sure that there is no fault.
- Check that the keyless access function is not stopped.
- When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK DOOR LOCK SWITCH.


Check that the lock/unlock operates with the driver's door lock switch.

Does it lock/unlock normally?

 [Go to 2.](#)

Check the door lock circuit.  [Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > SYMPTOM CHART.](#)

2. CHECK DATA MONITOR.


1. Using the Subaru Select Monitor, display the data [Passenger's seat lock status SW input] of [Body Control].  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Data Monitor.](#)
2. Read the data when locking/unlocking the passenger's side lock actuator.

Does the data change from ON/OFF?

 [Go to 3.](#)

Check the door lock switch circuit.

3. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, display the data monitor [Passenger's unlock touch sensor switch] of [Keyless Access with Push Button Start].  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Data Monitor.](#)
2. Read the data when operating the touch sensor (unlock) of the door outer handle.

Does the data change from ON/OFF according to the sensor operation?

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

No

 [Go to 4.](#)

4. CHECK HARNESS (OPEN CIRCUIT).




1. Disconnect the keyless access CM connector.
2. Disconnect the front outer handle connector.
3. Using a tester, measure the resistance between the keyless access CM connector and front outer handle connector.

Connector & terminal

(B574) No. 23 — (D56) No. 4:

Is the resistance less than 1 Ω ?

Yes

 [Go to 5.](#)

No

Repair or replace the open circuit of harness.

5. CHECK HARNESS (GROUND SHORT CIRCUIT).



Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(B574) No. 23 — Chassis ground:

(D56) No. 4 — Chassis ground:

Is the resistance 10 k Ω or more?

Yes


 [Go to 6.](#)

No

Repair or replace the short circuit of the harness.


6. REPLACE FRONT DOOR OUTER HANDLE.




Replace the passenger's side front outer handle with the driver's side front outer handle.  [Ref. to SECURITY AND LOCKS>Front Outer Handle>REMOVAL.](#)

Does it operate properly?

Yes

Replace the passenger's front outer handle.  [Ref. to SECURITY AND LOCKS>Front Outer Handle>REMOVAL.](#)

No


Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

8. KEYLESS ACCESS PASSENGER ROOM BUZZER DOES NOT SOUND

Caution:


- **Inspect LAN system according to the basic diagnostic procedure, and make sure that there is no fault.**
- **Check that the keyless access function is not stopped.**
- **When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**

1. CHECK COMBINATION METER.

Check the combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is the check result OK?

Yes


Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter>REMOVAL.](#)

9. KEYLESS ACCESS EXTERNAL BUZZER DOES NOT BEEP

1. CHECK BODY INTEGRATED UNIT SETTING.


Using the Subaru Select Monitor, check the data of [Answer-back Buzzer] of [Body Control].  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Data Monitor.](#)

Is the setting "ON"?


Yes

 [Go to 2.](#)

No

Change the setting to "ON".  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Customize.](#)

2. CHECK BUZZER OPERATION.


Using the Subaru Select Monitor, perform the active test [Keyless Buzzer Output] of [Body Control].  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Active Test.](#)

Does the buzzer sound?

Yes

 [Go to 3.](#)

No


 [Go to 5.](#)

3. CHECK KEYLESS ACCESS SYSTEM.


1. Turn to IGN ON.
2. With all doors closed and the access key carried, touch the touch sensor (lock) on the driver's door handle.

Does the door lock?

Yes

 [Go to 4.](#)

No

Refer to "CANNOT LOCK WITH KEYLESS ACCESS FROM THE DRIVER'S DOOR" and perform inspection.  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > CANNOT LOCK WITH KEYLESS ACCESS FROM THE DRIVER'S DOOR.](#)

4. CHECK KEYLESS ACCESS SYSTEM.


1. Open the door glass.
2. Place the access key on the driver's seat, and close the door.
3. Touch the touch sensor (lock) on the driver's door handle.

Does the buzzer sound? (Lockout prevention alert)

Yes

System is normal.

No

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

5. CHECK HARNESS (OPEN CIRCUIT).


1. Turn to IGN OFF.
2. Disconnect the connectors of the body integrated unit and keyless buzzer.
3. Measure the resistance between body integrated unit connector and keyless buzzer connector.

Connector & terminal

(B280) No. 20 — (B164) No. 1:

Is the resistance less than 10 Ω ?

Yes

 [Go to 6.](#)

No

Repair or replace the open circuit of harness.

6. CHECK HARNESS (GROUND SHORT CIRCUIT).


Measure the resistance between keyless buzzer connector and chassis ground.

Connector & terminal

(B164) No. 1 — Chassis ground:

Is the resistance 10 k Ω or more?

Yes

 [Go to 7.](#)

No

Repair or replace the short circuit of the harness.

7. CHECK HARNESS (OPEN CIRCUIT).

Measure the resistance between keyless buzzer connector and chassis ground.

Connector & terminal

(B164) No. 2 — Chassis ground:

Is the resistance less than 10 Ω ?


Yes

 [Go to 8.](#)

No

Repair or replace the open circuit of harness.

8. CHECK BODY INTEGRATED UNIT.


1. Connect the connector of body integrated unit.
2. Using the Subaru Select Monitor, perform the active test [Keyless Buzzer Output] of [Body Control].  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Active Test.](#)
3. Measure the voltage between body integrated unit connector and chassis ground using an oscilloscope.

Connector & terminal

(B280) No. 20 (+) — Chassis ground (-):

Is the frequency 2kHz, voltage 9 V or more?

Yes

Replace the keyless buzzer.  [Ref. to SECURITY AND LOCKS>Access Buzzer>REMOVAL.](#)

No

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

10. INTERIOR COLLATION DOES NOT FUNCTION

Caution:

When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK ACCESS KEY.

Check the battery of the access key.  [Ref. to SECURITY AND LOCKS>Access Key>INSPECTION.](#)

Is the check result OK?


Yes

 [Go to 2.](#)

No

Replace the battery.

2. CHECK INTERIOR ANTENNA.

1. Using the Subaru Select Monitor, select the system check [Front interior transmitter, interior tuner] of [Keyless Access with Push Button Start].  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Keyless Access System Check.](#)

2. Using a tester, check the output between keyless access CM connector terminals while performing the Keyless access system check.

Connector & terminal

(B574) No. 2 — (B574) No. 3:

Is a pulse output?

Yes

 [Go to 3.](#)

No

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

3. CHECK INTERIOR ANTENNA.



1. Using the Subaru Select Monitor, select the system check [Rear interior transmitter, interior tuner] of [Keyless Access with Push Button Start]. [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Keyless Access System Check.](#)
2. Using a tester, check the output between keyless access CM connector terminals while performing the Keyless access system check.

Connector & terminal

(B573) No. 10 — (B573) No. 11:

Is a pulse output?

Yes

[Go to 4.](#)

No

Replace the keyless access CM. [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

4. CHECK INTERIOR ANTENNA.



1. Using the Subaru Select Monitor, select the system check [Trunk internal transmitter, interior tuner] or [Rear gate internal transmitter, interior tuner] of [Keyless Access with Push Button Start]. [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Keyless Access System Check.](#)
2. Using a tester, check the output between keyless access CM connector terminals while performing the Keyless access system check.

Connector & terminal

(B573) No. 8 — (B573) No. 9:

Is a pulse output?

Yes

[Go to 5.](#)

No

Replace the keyless access CM. [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

5. CHECK WIRING HARNESS (OPEN).



1. Disconnect the front interior antenna connector and the keyless access CM connector.
2. Using a tester, check continuity between the front interior antenna connector and the keyless access CM connector.

Connector & terminal

(B579) No. 1 — (B574) No. 3:

(B579) No. 3 — (B574) No. 2:

Is there continuity?

Yes

 [Go to 6.](#)

No

Repair or replace the open circuit of harness.

6. CHECK WIRING HARNESS (OPEN).

1. Disconnect the center interior antenna connector and the keyless access CM connector.
2. Using a tester, check continuity between the center interior antenna connector and the keyless access CM connector.

Connector & terminal

(R298) No. 1 — (B573) No. 11:

(R298) No. 3 — (B573) No. 10:

Is there continuity?

Yes

 [Go to 7.](#)

No

Repair or replace the open circuit of harness.

7. CHECK WIRING HARNESS (OPEN).

1. Disconnect the rear interior antenna connector and the keyless access CM connector.
2. Using a tester, check continuity between the rear interior antenna connector and the keyless access CM connector.

Connector & terminal

(R297) No. 1 — (B573) No. 9:

(R297) No. 3 — (B573) No. 8:

Is there continuity?


Yes

 [Go to 8.](#)

No


Repair or replace the open circuit of harness.

8. CHECK ANTENNA.

Replace the front interior antenna with a new or properly functioning part.  [Ref. to SECURITY AND LOCKS>Keyless Access Indoor Antenna>REMOVAL.](#)

Does it operate properly?

Yes


Replace the front interior antenna.  [Ref. to SECURITY AND LOCKS>Keyless Access Indoor Antenna>REMOVAL.](#)

No

 [Go to 9.](#)


9. CHECK ANTENNA.




Replace the center passenger room antenna with a new or properly functioning part.  [Ref. to SECURITY AND LOCKS>Keyless Access Indoor Antenna>REMOVAL.](#)

Does it operate properly?

Yes


Replace the center passenger room antenna.  [Ref. to SECURITY AND LOCKS>Keyless Access Indoor Antenna>REMOVAL.](#)

No

 [Go to 10.](#)

10. CHECK ANTENNA.




Replace the rear interior antenna with a new or properly functioning part.  [Ref. to SECURITY AND LOCKS>Keyless Access Indoor Antenna>REMOVAL.](#)

Does it operate properly?

Yes

Replace the rear interior antenna.  [Ref. to SECURITY AND LOCKS>Keyless Access Indoor Antenna>REMOVAL.](#)

No

 [Go to 11.](#)

11. CHECK WIRING HARNESS (OPEN).



1. Disconnect the receiver connector and the keyless access CM connector.
2. Using a tester, check continuity between the receiver connector and keyless access CM connector.

Connector & terminal


(R296) No. 4 — (B573) No. 5:

(R296) No. 5 — (B573) No. 17:

(R296) No. 2 — (B573) No. 19:

Is there continuity?


Yes

 [Go to 12.](#)

No

Repair or replace the open circuit of harness.

12. CHECK RECEIVER.


Replace the receiver with a new or properly functioning part.  [Ref. to SECURITY AND LOCKS>Receiver>REMOVAL.](#)

Does it operate properly?


Yes

Replace the receiver.  [Ref. to SECURITY AND LOCKS>Receiver>REMOVAL.](#)

No


 [Go to 13.](#)

13. CHECK KEYLESS ACCESS SYSTEM CHECK.


1. Using the Subaru Select Monitor, select the system check [Front interior transmitter, interior tuner] of [Keyless Access with Push Button Start].  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Keyless Access System Check.](#)
2. Hold the access key 1 m or more away from the audio panel, then come closer to within 0.8 m.

Does the buzzer sound?


Yes

 [Go to 14.](#)

No

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

14. CHECK KEYLESS ACCESS SYSTEM CHECK.


1. Using the Subaru Select Monitor, select the system check [Rear interior transmitter, interior tuner] of [Keyless Access with Push Button Start].  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Keyless Access System Check.](#)
2. Hold the access key 1 m or more away from the center of the second row seats, then come closer to within 0.8 m.

Does the buzzer sound?


Yes

 [Go to 15.](#)

No

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

15. CHECK KEYLESS ACCESS SYSTEM CHECK.


1. Using the Subaru Select Monitor, select the system check [Trunk internal transmitter, interior tuner] or [Rear gate internal transmitter, interior tuner] of [Keyless Access with Push Button Start].  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Keyless Access System Check.](#)
2. Hold the access key 1 m or more away from the back of the rear seat, then come closer to within 0.8 m.

Does the buzzer sound?

Yes

System is normal.

No

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

11. REAR GATE CANNOT BE UNLOCKED WITH THE REAR GATE OPENER BUTTON

Caution:

- Check that there are no other registered access keys inside the rear gate.
- Inspect LAN system according to the basic diagnostic procedure, and make sure that there is no fault.
- Check that the keyless access function is not stopped.
- When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK KEYLESS OPERATION.



Check that the rear gate unlocks when the rear gate unlock button of the access key is pressed.

Does it operate properly?


Yes

 [Go to 6.](#)

No

For vehicles without power rear gate  [Go to 2.](#)
For vehicles with power rear gate  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > PRG OPENER BUTTON DOES NOT FUNCTION.](#)

2. CHECK REAR GATE UNLOCK OPERATION.

1. Using the Subaru Select Monitor, select the active test [R gate/trunk UNLK output] of [Body Control].  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Active Test.](#)
2. Check that the rear gate unlocks when [R gate/trunk UNLK output] is output.

Does it operate properly?

Yes

 [Go to 6.](#)

No

 [Go to 3.](#)

3. CHECK HARNESS.

1. Disconnect the body integrated unit connector and rear gate lock actuator connector.
2. Check the continuity between body integrated unit connector and rear gate lock actuator connector.

Connector & terminal

(i171) No. 7 — (D46) No. 1:

Is there continuity?

Yes

 [Go to 4.](#)

No

Repair or replace the open circuit of harness.

4. CHECK HARNESS.

1. Check the continuity between the rear gate lock actuator connector and chassis ground.

Connector & terminal

(D46) No. 2 — Chassis ground:

Is there continuity?


Yes

 [Go to 5.](#)

No

Repair or replace the open circuit of harness.

5. CHECK REAR GATE LOCK ACTUATOR.


1. Check the rear gate lock actuator.  [Ref. to SECURITY AND LOCKS>Rear Gate Latch and Actuator Assembly>INSPECTION.](#)

Is the check result OK?

Yes

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

No

Replace the rear gate latch and actuator assembly.  [Ref. to SECURITY AND LOCKS>Rear Gate Latch and Actuator Assembly.](#)

6. CHECK ACCESS KEY.


1. Prepare all access keys registered to the vehicle.
2. Check that the rear gate lock can be unlocked with each access key.

Does it operate properly?


Yes

 [Go to 7.](#)

No


Replace the access key.  [Ref. to SECURITY AND LOCKS>Access Key>REPLACEMENT.](#)

7. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, display the data monitor [R Gate Release SW input] of [Body Control].  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Data Monitor.](#)
2. Read the data when pressing the rear gate opener button.

Does the data display ON?

Yes

 [Go to 14.](#)

No

 [Go to 8.](#)

8. CHECK WIRING HARNESS.


1. Disconnect the rear gate opener button connector and body integrated unit connector.
2. Using a tester, check the continuity between the rear gate opener button connector and body integrated unit connector.

Connector & terminal

(D77) No. 5 — (i84) No. 10:

Is there continuity?

Yes

 [Go to 9.](#)

No

Repair or replace the open circuit of harness.

9. CHECK WIRING HARNESS.


1. Using a tester, check the continuity between the rear gate opener button connector and chassis ground.

Connector & terminal

(D77) No. 6 — Chassis ground:

Is there continuity?

Yes

 [Go to 10.](#)

No

Repair or replace the open circuit of harness.

10. CHECK REAR GATE OPENER BUTTON.


Using a tester, check the continuity between rear gate opener button connector terminals.

Connector & terminal


(D77) No. 5 — (D77) No. 6:

Is there continuity when pressing the switch?

Yes

 [Go to 11.](#)

No

Replace the rear gate opener button.  [Ref. to SECURITY AND LOCKS>Rear Gate Opener Button>REMOVAL.](#)

11. CHECK WIRING HARNESS.

1. Disconnect the exterior rear antenna connector and the keyless access CM connector.
2. Using a tester, check continuity between the exterior rear antenna connector and keyless access CM connector.


Connector & terminal

(AD23) No. 1 — (B573) No. 2:

(AD23) No. 2 — (B573) No. 1:

Is there continuity?


Yes

 [Go to 12.](#)

No

Repair or replace the open circuit of harness.

12. CHECK OUTSIDE REAR ANTENNA.


Replace the outside rear antenna with new or properly working parts.  [Ref. to SECURITY AND LOCKS>Keyless Access Outdoor Antenna>REMOVAL.](#)

Does it operate properly?


Yes

The outside rear antenna has a failure.

No


 [Go to 13.](#)

13. CHECK DATA MONITOR.


1. Display the data monitor R gate lock status SW of body integrated unit using Subaru Select Monitor.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Data Monitor.](#)
2. Read the data when locking/unlocking the rear gate lock actuator.

Does the data change as ON ↔ OFF?


Yes

 [Go to 14.](#)


No

Check body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL.](#)

14. CHECK KEYLESS ACCESS SYSTEM CHECK.


1. Using the Subaru Select Monitor, select the system check Rear gate external transmitter, interior tuner of [Keyless Access with Push Button Start].  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Keyless Access System Check.](#)
2. Hold the access key 1 m or more away from the trunk, then come closer to within 0.8 m.

Does the outside buzzer sound?

 System is normal.

Yes

No

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

12. CAN NOT LOCK WHEN USING THE REAR LOCK BUTTON

Caution:


- Check that there are no other registered access keys inside the vehicle.
- Check that the keyless access function is not stopped.
- Inspect LAN system or keyless access system according to the basic diagnostic procedure, and make sure that DTC is not input.
- When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK REAR GATE ACTUATOR.


While carrying the access key, operate the touch sensor (lock) and touch sensor (unlock).

When the switch is operated, does the rear gate lock/unlock?

Yes

 [Go to 2.](#)

No

 [Go to 10.](#)

2. CHECK REAR LOCK BUTTON.

1. Using the Subaru Select Monitor, display the data monitor [Rear Gate Request SW] of [Keyless Access with Push Button Start].
2. Read the data when operating the rear lock button.

Does the data change between ON/OFF?

Yes

 [Go to 8.](#)

No

 [Go to 3.](#)

3. CHECK HARNESS.

1. Disconnect the rear lock button connector and the keyless access CM connector.
2. Using a tester, measure the resistance between harness.

Connector & terminal

(D77) No. 3 — (B573) No. 27:

Is the resistance less than 10 Ω ?

Yes

 [Go to 4.](#)

No

Repair or replace the open circuit of the harness.

4. CHECK HARNESS.



Using a tester, measure the resistance between harness and chassis ground.

Connector & terminal

(D77) No. 3 — Chassis ground:

Is the resistance 10 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair or replace the short of harness.

5. CHECK HARNESS.




Using a tester, measure the resistance between harness and chassis ground.

Connector & terminal

(D77) No. 4 — Chassis ground:

Is the resistance less than 10 Ω ?

Yes

 [Go to 6.](#)

No

Repair or replace the open circuit of the harness.

6. CHECK REAR LOCK BUTTON.



Measure the resistance when the rear lock button is operated using the tester.

Connector & terminal

(D77) No. 3 — (D77) No. 4:


Did the resistance change from 1 M Ω or more to less than 10 Ω ?



 [Go to 7.](#)

Yes

No

Replace the rear lock button.  [Ref. to SECURITY AND LOCKS>Rear Lock Button>REMOVAL.](#)

7. CHECK REAR LOCK BUTTON.


1. Using the Subaru Select Monitor, display the data monitor [Rear Gate Request SW] of [Keyless Access with Push Button Start].
2. Read the data when operating the rear lock button.

Does the data change between ON/OFF?

Yes

 [Go to 8.](#)

No

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

8. CHECK WIRING HARNESS.

1. Disconnect the exterior rear antenna connector and the keyless access CM connector.
2. Using a tester, check continuity between the exterior rear antenna connector and keyless access CM connector.

Connector & terminal

(AD23) No. 1 – (B573) No. 2:

(AD23) No. 2 – (B573) No. 1:

Is there continuity?


Yes

 [Go to 9.](#)

No

Repair or replace the open circuit of harness.

9. CHECK OUTSIDE REAR ANTENNA.


Replace the outside rear antenna with new or properly working parts.  [Ref. to SECURITY AND LOCKS>Keyless Access Outdoor Antenna>REMOVAL.](#)

Does it operate properly?


Yes

The outside rear antenna has a failure.

No

 [Go to 10.](#)

10. CHECK BODY INTEGRATED UNIT.


1. Connect the disconnected connectors.
2. Using the Subaru Select Monitor, perform the active test [lock actuator LOCK output] of [Body Control].  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Active Test.](#)

Does the rear gate lock actuator lock?

Yes

It is possible that temporary poor communication occurs.

No

 [Go to 11.](#)

11. CHECK HARNESS.


1. Disconnect the body integrated unit connector and rear gate lock actuator connector.
2. Check the continuity between body integrated unit connector and rear gate lock actuator connector.

Connector & terminal

(i171) No. 7 — (D46) No. 1:

Is there continuity?

Yes

 [Go to 12.](#)

No

Repair or replace the open circuit of harness.

12. CHECK HARNESS.


1. Check the continuity between the rear gate lock actuator connector and chassis ground.

Connector & terminal

(D46) No. 2 — Chassis ground:

Is there continuity?

Yes

 [Go to 13.](#)

No

Repair or replace the open circuit of harness.

13. CHECK REAR GATE LOCK ACTUATOR.



1. Check the rear gate lock actuator. [Ref. to SECURITY AND LOCKS>Rear Gate Latch and Actuator Assembly>INSPECTION.](#)

Is the check result OK?

Yes

Replace the body integrated unit. [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

No

Replace the rear gate latch and actuator assembly. [Ref. to SECURITY AND LOCKS>Rear Gate Latch and Actuator Assembly.](#)

13. THE STEERING LOCK IS NOT RELEASED

Caution:

When the steering lock CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK OPERATION.



1. Depress the brake pedal (except for MT model) or clutch pedal (MT model).
2. While turning the steering wheel lightly to the left and right, press the push button ignition switch.
3. Confirm that the steering lock is released and the engine start.

Does the engine fail to start with the steering lock released?

Yes

Perform the diagnosis for engine system. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostics for Engine Starting Failure.](#) [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostics for Engine Starting Failure.](#)

No

[Go to 2.](#)

2. CHECK DTC.



Read the DTC of Keyless Access with Push Button Start using the Subaru Select Monitor. [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC displayed?


Yes

Perform the diagnosis according to the procedures for the DTC.

No

 [Go to 3.](#)

3. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, display the data monitor [Steering lock unlock request reception status] and [Steering lock lock/unlock command reception history] of [Keyless Access with Push Button Start].  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Data Monitor.](#)
2. Read the data when the push button ignition switch is pressed while in possession of the access key. (Maintain for 10 seconds after switch operation)

Does the data change from "Not yet received" to "Reception", and from "OFF" to "ON"?

Yes

 [Go to 4.](#)

No

 [Go to 7.](#)

4. CHECK STEERING LOCK CM.

1. Disconnect the steering lock CM connector.
2. Using a tester, measure the voltage between the steering lock CM connector and chassis ground.

Connector & terminal

(B424) No. 7 (+) — Chassis ground (—):

Is the voltage 10 V or more?

Yes

 [Go to 5.](#)

No

Repair or replace the open circuit of harness.

5. CHECK STEERING LOCK CM.

Using a tester, check continuity between the steering lock CM connector and chassis ground.

Connector & terminal

(B424) No. 1 — Chassis ground:

Is there continuity?

Yes

 [Go to 6.](#)

No

Repair or replace the open circuit of harness.

6. CHECK STEERING LOCK CM.


1. Connect the disconnected connectors.
2. Using a tester, measure the voltage between steering lock CM terminals right after the ignition switch is turned to ON.

Connector & terminal

(B424) No. 3 (+) — (B424) No. 1 (-):

Does the voltage remain 1 V or less immediately after the ignition ON?


Yes

Replace the steering lock CM.  [Ref. to SECURITY AND LOCKS>Steering Lock CM>REMOVAL.](#)

No


Repair or replace the open circuit of harness.

7. CHECK STEERING LOCK CM.


1. Replace with a properly functioning or new steering lock CM.  [Ref. to SECURITY AND LOCKS>Steering Lock CM>REMOVAL.](#)
2. After registering, the steering lock operates when the ignition is turned to OFF and the driver's door is opened and closed.
3. Turn the ignition to ON.
4. Operate the steering and check for whether the steering lock is released.

Is the steering lock released, and does the engine start?

Yes

Replace the steering lock CM.  [Ref. to SECURITY AND LOCKS>Steering Lock CM>REMOVAL.](#)

No

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)


14. THE STEERING LOCK DOES NOT OPERATE

Caution:

When the keyless access CM or steering lock CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK DTC.

Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor.

 [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC displayed?


Yes

Perform the diagnosis according to the corresponding DTC.

No

 [Go to 2.](#)

2. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, display the data monitor [Driver's door SW input] of [Body Control].  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Data Monitor.](#)
2. Read the data when opening and closing the driver's door.

Does the data change from ON to OFF according to the opening and closing?


Yes

 [Go to 3.](#)

No

Inspect door switch circuit.

3. CHECK DATA MONITOR.

Using the Subaru Select Monitor, display the data monitor [Shift P Signal] of [Keyless Access with Push Button Start].  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Data Monitor.](#)

Is the status displayed correctly when the shift lever is shifted from P to other than P?


Yes

 [Go to 4.](#)

No

Check the P range switch and harness.

4. CHECK DATA MONITOR.


Using the Subaru Select Monitor, display the data monitor [Code collation result between smart ECM and ID code box] of [Keyless Access with Push Button Start].  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Data Monitor.](#)

Is the status normal?


Yes

 [Go to 5.](#)

No

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

5. CHECK DATA MONITOR.


Using the Subaru Select Monitor, display the data monitor [Code collation result between steering locked ECM and ID code box] of [Keyless Access with Push Button Start].  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Data Monitor.](#)

Is the status normal?


Yes

 [Go to 6.](#)

No

Replace the steering lock CM.  [Ref. to SECURITY AND LOCKS>Steering Lock CM>REMOVAL.](#)

6. CHECK DATA MONITOR.


1. Using the Subaru Select Monitor, display the data monitor [Steering lock lock/unlock command reception history] of [Keyless Access with Push Button Start].  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Data Monitor.](#)
2. While in possession of the access key, perform engine start operations, and read data within 10 seconds after starting.

Is data displayed as ON?

Yes

 [Go to 7.](#)

No

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

7. CHECK STEERING LOCK CM.

Using a tester, measure the waveform between steering lock CM terminals immediately after the following operations.


Perform ignition ON, driver's side door close → shift lever "P" range, ignition OFF, and close → open the driver's side door.

Connector & terminal

(B424) No. 3 — (B424) No. 1:

Is the waveform immediately after opening the driver's side door abnormal?

Yes

Replace the steering lock CM.  [Ref. to SECURITY AND LOCKS>Steering Lock CM>REMOVAL.](#)

No

 [Go to 8.](#)

8. CHECK WIRING HARNESS (OPEN).

1. Disconnect the keyless access CM connector and the steering lock CM connector.
2. Using a tester, check continuity between the keyless access CM connector and steering lock CM connector.

Connector & terminal

(B424) No. 3 — (B574) No. 29:

Is there continuity?

Yes

 [Go to 9.](#)

No

Repair or replace the open circuit of harness.

9. CHECK WIRING HARNESS (OPEN).

Using a tester, check continuity between the keyless access CM connector and chassis ground.

Connector & terminal

(B572) No. 11 — Chassis ground:

Is there continuity?

Yes

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

No

Repair or replace the open circuit of harness.

15. POWER WILL NOT TURN ON (BOTH ACCESSORY AND IGNITION)

Caution:


- When the keyless access CM is replaced with a new unit, and the battery ground terminal is connected, it will become ignition ON. Also, if the battery is disconnected, it will resume to a condition with the battery cut off.
- When the keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR

IMMOBILIZER” provided as a separate volume.

1. CHECK FUSE.

Check the fuse.  [Ref. to SECURITY AND LOCKS>Relay and Fuse.](#)

Is the check result OK?

 [Go to 2.](#)

Replace the fuse.

2. CHECK POWER SUPPLY.

1. Remove IG relay 1 (push button start), IG relay 2 (push button start) and accessory relay (push button start).
2. Using a tester, measure the voltage between the relay block connector and chassis ground.

Is the voltage 10 V or more?

 [Go to 3.](#)

Check the DC power supply circuit.

3. CHECK CONNECTOR.

Check the engagement of each connector and for any deformation or looseness.

Is the check result OK?

 [Go to 4.](#)

Repair the connector, or replace harness.

4. CHECK WIRING HARNESS.

1. Disconnect the keyless access CM connector.
2. Using a tester, measure the voltage between the keyless access CM connector and chassis ground.

Connector & terminal

(B572) No. 2 (+) — Chassis ground (-):

Is the voltage between 8 V and 16 V?

Yes

 [Go to 5.](#)

No

Repair or replace the open circuit of harness.

5. CHECK WIRING HARNESS (OPEN).

Using a tester, check continuity between the keyless access CM connector and chassis ground.

Connector & terminal

(B572) No. 11 — Chassis ground:

Is there continuity?


Yes

 [Go to 6.](#)

No

Repair or replace the open circuit of harness.

6. CHECK DTC.

1. Connect the keyless access CM connector.
2. Carrying the access key, depress the brake pedal (except for MT model) or clutch pedal (MT model), and push the push button ignition switch.
3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor.  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC output?


Yes

Perform the diagnosis according to DTC.

No

 [Go to 7.](#)

7. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, display the data monitor [Push start SW 1] and [Push start SW 2] of [Keyless Access with Push Button Start].  [Ref. to KEYLESS ACCESS](#)

[WITH PUSH BUTTON START\(DIAGNOSTICS\)>Data Monitor.](#)


2. Read the data when pressing the push button ignition switch.

Does it change from OFF to ON along with the operation?


Yes

 [Go to 8.](#)

No

 [Go to 15.](#)

8. CHECK RELAY (PUSH BUTTON START).

Check IG relay 1 and 2 (push button start), and accessory relay (push button start).  [Ref. to SECURITY AND LOCKS>IG Relay1 \(Push Button Start\)>INSPECTION.](#)

Is the check result OK?

Yes

 [Go to 9.](#)

No

Replace the faulty relay.

9. CHECK WIRING HARNESS (OPEN).

1. Disconnect the keyless access CM connector, IG relay 1 (push button start), IG relay 2 (push button start) and accessory relay (push button start).
2. Using a tester, check continuity between terminals of keyless access CM connector, IG relay 1 (push button start), IG relay 2 (push button start) and accessory relay (push button start).

Connector & terminal


(B574) No. 6 — (B225) No. 38:

(B572) No. 9 — (B225) No. 34:

(B574) No. 4 — (B426) No. 1:

Is there continuity?

Yes

 [Go to 10.](#)

No

Repair or replace the open circuit of harness.

10. CHECK WIRING HARNESS (GROUND SHORT CIRCUIT).

Using a tester, check continuity between the keyless access CM connector and chassis ground.

Connector & terminal

(B572) No. 9 — Chassis ground:

(B574) No. 4 — Chassis ground:


(B574) No. 6 — Chassis ground:

Is there continuity?

Yes

Repair or replace the short circuit of the harness.

No

 [Go to 11.](#)

11. CHECK WIRING HARNESS (OPEN).




Using a tester, check the continuity between the IG relay 1 (push button start) connector and chassis ground.

Connector & terminal

(B225) No. 39 — Chassis ground:

Is there continuity?

Yes

 [Go to 12.](#)

No

Repair or replace the open circuit of harness.

12. CHECK WIRING HARNESS (OPEN).




Using a tester, check the continuity between the IG relay 2 (push button start) connector and chassis ground.

Connector & terminal

(B225) No. 35 — Chassis ground:

Is there continuity?

Yes

 [Go to 13.](#)

No

Repair or replace the open circuit of harness.

13. CHECK WIRING HARNESS (OPEN).




Using a tester, check continuity between the accessory relay (push button start) connector and chassis ground.

Connector & terminal

(B426) No. 3 — Chassis ground:

Is there continuity?

Yes

 [Go to 14.](#)

No

Repair or replace the open circuit of harness.

14. CHECK KEYLESS ACCESS CM.



1. Connect all the disconnected connectors.
2. Using a tester, measure the voltage between the keyless access CM connector and chassis ground when the ignition is turned from OFF to ON.

Connector & terminal


(B572) No. 9 (+) — Chassis ground (-):

(B574) No. 4 (+) — Chassis ground (-):


(B574) No. 6 (+) — Chassis ground (-):

Did the voltage change from 1 V or less to +B-2 V or more?

Yes

 [Go to 15.](#)

No

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

15. CHECK PUSH BUTTON IGNITION SWITCH.



1. Disconnect the push button ignition switch connector.
2. Using a tester, check the continuity between the push button ignition switch terminals.


Connector & terminal

(i150) No. 7 — (i150) No. 5:


(i150) No. 2 — (i150) No. 5:

Did it change to continuity exists, when the button was pressed? (No continuity when button is released)

Yes

 [Go to 16.](#)

No

Replace the push button ignition switch.  [Ref. to SECURITY AND LOCKS>Push Button Ignition Switch>REMOVAL.](#)

16. CHECK WIRING HARNESS (OPEN).

Using a tester, check the continuity between the push button ignition switch connector and chassis ground.


Connector & terminal

(i150) No. 4 — Chassis ground:

(i150) No. 5 — Chassis ground:

Is there continuity?

Yes

 [Go to 17.](#)

No

Repair or replace the open circuit of harness.

17. CHECK WIRING HARNESS (OPEN).

1. Disconnect the keyless access CM connector.
2. Using a tester, check continuity between the keyless access CM connector and the push button ignition switch connector.

Connector & terminal

(i150) No. 7 — (B574) No. 28:

(i150) No. 2 — (B574) No. 30:

Is there continuity?

Yes

System is normal.

No


Repair or replace the open circuit of harness.

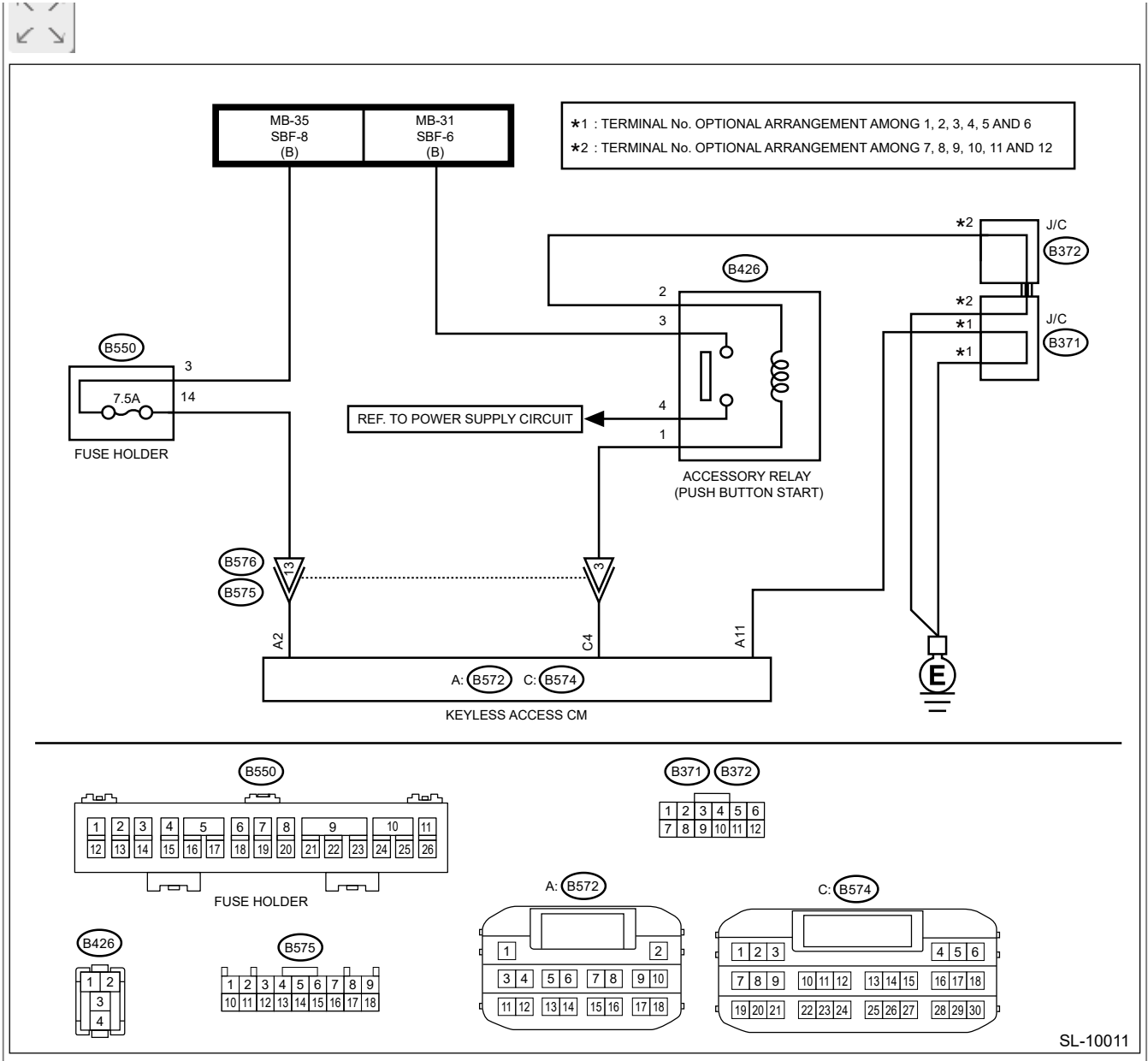
16. POWER WILL NOT TURN ON (ACCESSORY DOES NOT TURN ON, BUT IGNITION TURNS ON)

Caution:

- When the keyless access CM is replaced with a new unit, and the battery ground terminal is connected, it will become ignition ON. Also, if the battery is disconnected, it will resume to a condition with the battery cut off.
- When the keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Wiring diagram:

Push button start system  [Ref. to WIRING SYSTEM>Push Button Start System>WIRING DIAGRAM.](#)



SL-10011

1. CHECK FUSE.

Check the fuse. [Ref. to SECURITY AND LOCKS>Relay and Fuse.](#)

Is the check result OK?

Yes

[Go to 2.](#)

No

Replace the fuse.

2. CHECK CONNECTOR.

Check the engagement of each connector and for any deformation or looseness.

Is the check result OK?

Yes

 [Go to 3.](#)

No

Repair the connector, or replace harness.

3. CHECK WIRING HARNESS.

1. Disconnect the keyless access CM connector.
2. Using a tester, measure the voltage between the keyless access CM connector and chassis ground.

Connector & terminal

(B572) No. 2 (+) — Chassis ground (-):

Is the voltage between 8 V and 16 V?

Yes

 [Go to 4.](#)

No

Repair or replace the open circuit of harness.

4. CHECK WIRING HARNESS (OPEN).

Using a tester, check continuity between the keyless access CM connector and chassis ground.

Connector & terminal

(B572) No. 11 — Chassis ground:

Is there continuity?


Yes

 [Go to 5.](#)

No


Repair or replace the open circuit of harness.

5. CHECK ACCESSORY RELAY (PUSH BUTTON START).

Check the accessory relay (push button start).  [Ref. to SECURITY AND LOCKS>Accessory Relay \(Push Button Start\)>INSPECTION.](#)

Is the check result OK?

Yes

 [Go to 6.](#)

No

Replace the relay.

6. CHECK WIRING HARNESS (OPEN).

1. Disconnect the keyless access CM connector and the accessory relay (push button start).
2. Using a tester, check continuity between the keyless access CM connector and the accessory relay (push button start) connector.

Connector & terminal

(B574) No. 4 — (B426) No. 1:

Is there continuity?

Yes

 [Go to 7.](#)

No

Repair or replace the open circuit of harness.

7. CHECK WIRING HARNESS (OPEN).

Using a tester, check continuity between the keyless access CM connector and chassis ground.

Connector & terminal

(B574) No. 4 — Chassis ground:

Is there continuity?

Yes

Repair or replace the short circuit of the harness.

No

 [Go to 8.](#)


8. CHECK KEYLESS ACCESS CM.

1. Connect the keyless access CM connector.
2. Using a tester, measure the voltage between the keyless access CM connector and chassis ground when the ignition is turned from OFF to ON.

Connector & terminal

(B574) No. 4 (+) — Chassis ground (-):

Did the voltage change from 1 V or less → +B-2 V or more?


Yes	System is normal.
No	Replace the keyless access CM.  Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.

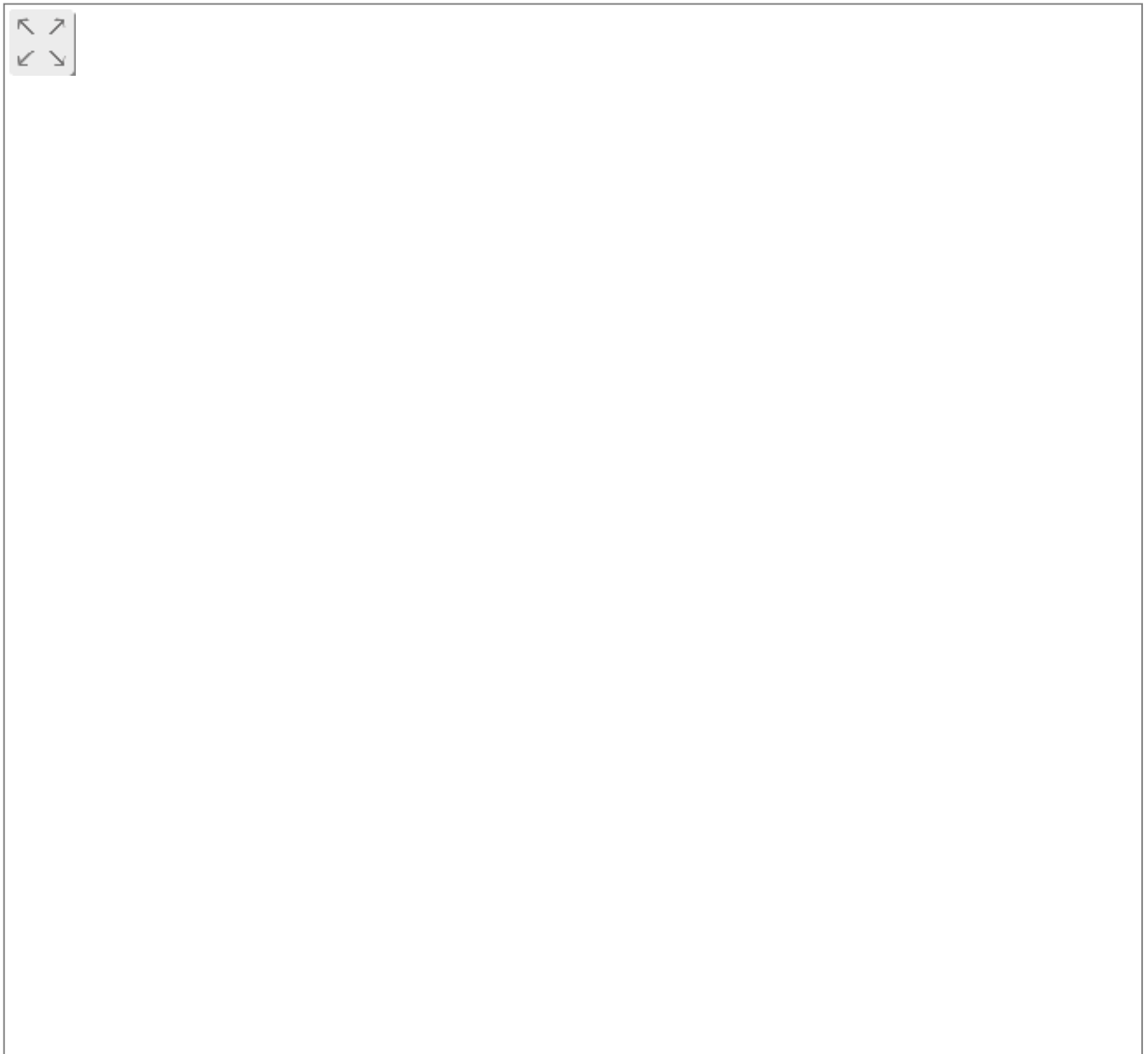
17. POWER WILL NOT TURN ON (ACCESSORY TURNS ON, BUT IGNITION DOES NOT TURN ON)

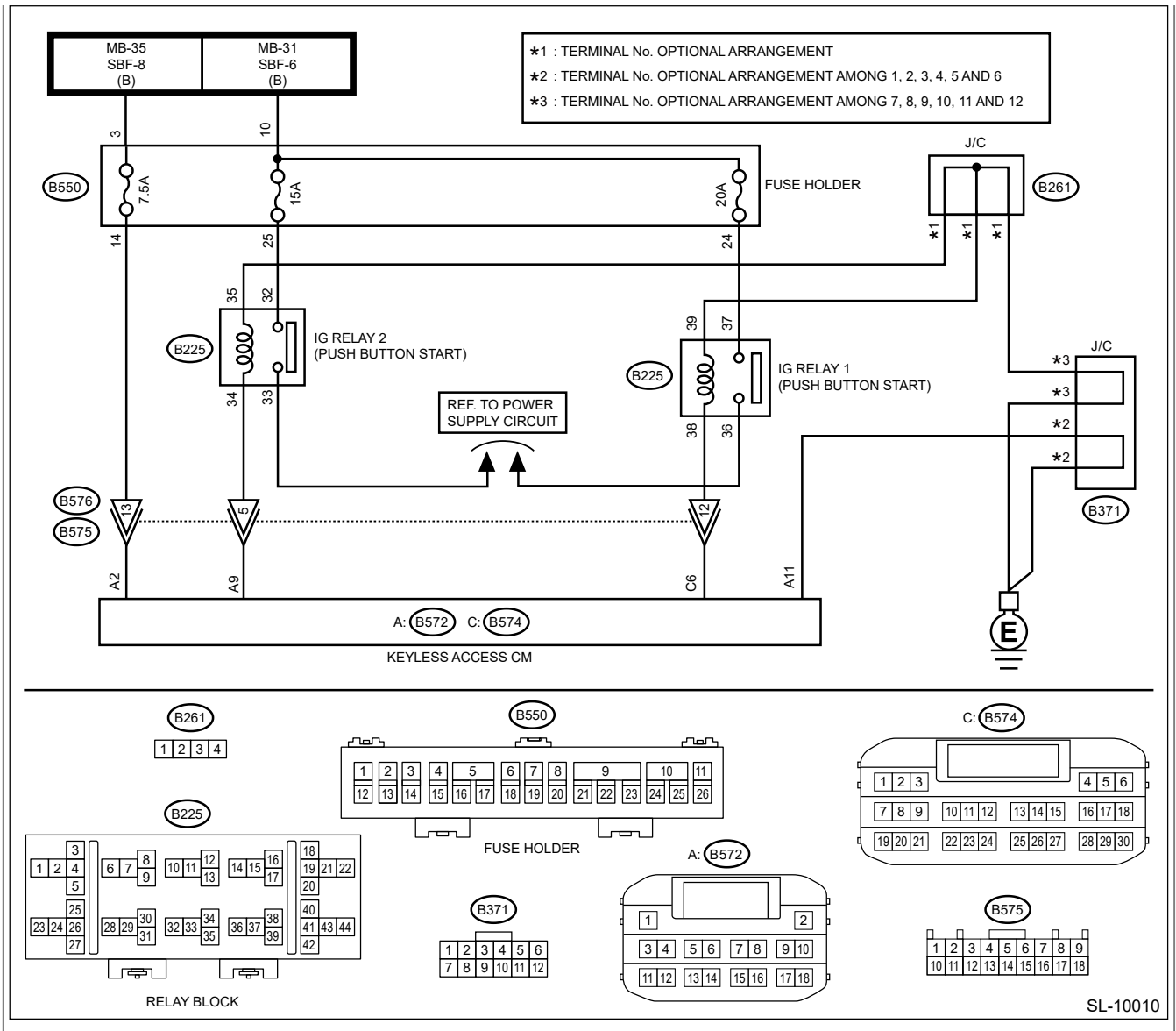
Caution:

When the keyless access CM is replaced with a new unit, and the battery ground terminal is connected, it will become ignition ON. Also, if the battery is disconnected, it will resume to a condition with the battery cut off.

Wiring diagram:

Push button start system  [Ref. to WIRING SYSTEM>Push Button Start System>WIRING DIAGRAM.](#)





1. CHECK FUSE.

Check the fuse. [Ref. to SECURITY AND LOCKS>Relay and Fuse.](#)

Is the check result OK?

Yes

[Go to 2.](#)

No

Replace the fuse.

2. CHECK CONNECTOR.

Check the engagement of each connector and for any deformation or looseness.

Is the check result OK?

Yes

 [Go to 3.](#)

No

Repair the connector, or replace harness.

3. CHECK WIRING HARNESS.



1. Disconnect the keyless access CM connector.
2. Using a tester, measure the voltage between the keyless access CM connector and chassis ground.

Connector & terminal

(B572) No. 2 (+) — Chassis ground (—):

Is the voltage between 8 V and 16 V?

Yes

 [Go to 4.](#)

No

Repair or replace the open circuit of harness.

4. CHECK WIRING HARNESS (OPEN).



Using a tester, check continuity between the keyless access CM connector and chassis ground.

Connector & terminal

(B572) No. 11 — Chassis ground:

Is there continuity?

Yes


 [Go to 5.](#)

No

Repair or replace the open circuit of harness.

5. CHECK IG RELAY 1 AND 2 (PUSH BUTTON START).



Check IG relay 1 (push button start) and IG relay 2 (push button start).  [Ref. to SECURITY AND LOCKS>IG Relay1 \(Push Button Start\)>INSPECTION.](#)

Is the check result OK?

Yes

 [Go to 6.](#)

No

Replace the relay.

6. CHECK WIRING HARNESS (OPEN).

1. Disconnect the keyless access CM connector and the IG relay 1 and 2 (push button start).
2. Using a tester, check continuity between the keyless access CM connector and the IG relay 1 (push button start) or IG relay 2 (push button start) connectors.

Connector & terminal

(B572) No. 9 — (B225) No. 34:

(B574) No. 6 — (B225) No. 38:

Is there continuity?

Yes

 [Go to 7.](#)

No

Repair or replace the open circuit of harness.

7. CHECK WIRING HARNESS (GROUND SHORT CIRCUIT).

Using a tester, check continuity between the keyless access CM connector and chassis ground.

Connector & terminal

(B572) No. 9 — Chassis ground:

(B574) No. 6 — Chassis ground:

Is there continuity?

Yes

Repair or replace the short circuit of the harness.

No

 [Go to 8.](#)

8. CHECK KEYLESS ACCESS CM.

1. Connect the keyless access CM connector.
2. Using a tester, measure the voltage between the keyless access CM connector and chassis ground when the ignition is turned from OFF to ON.

Connector & terminal

(B572) No. 9 (+) — Chassis ground (-):

(B574) No. 6 (+) — Chassis ground (-):

Did the voltage change from 1 V or less → +B-2 V or more?

Yes

System is normal.

No

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

18. ENGINE DOES NOT START

Caution:

- When the keyless access CM is replaced with a new unit, and the battery ground terminal is connected, it will become ignition ON. Also, if the battery is disconnected, it will resume to a condition with the battery cut off.
- When the keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. INITIALIZE STEERING LOCK.

1. Shift the shift lever to parking (except for MT model), or neutral for MT model.
2. Operate the driver's door switch ON/OFF with the ignition switch OFF.
3. Wait for 10 seconds.
4. Place the access key on the driver's seat.
5. Depress the brake pedal (except for MT model) or clutch pedal (MT model), and push the push button ignition switch.

Can the engine start?

Yes


System is normal.

No

 [Go to 2.](#)


2. CHECK DTC.

Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor.

 [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC detected?

Yes

Perform the diagnosis according to the DTC.  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 3.](#)

3. CHECK POWER SUPPLY SWITCHING.


1. Place the access key on the driver's seat.
2. Without depressing the brake pedal (except for MT model) or clutch pedal (MT model), push the push button ignition switch.

When the switch is operated, does it change as <IG-OFF> → <ACC-ON> → <IG-ON> → <IG-OFF>?


Yes

 [Go to 4.](#)

No

Perform the diagnostics according to the symptom for power supply switching system in General Diagnostic Table.  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>General Diagnostic Table>INSPECTION > POWER SUPPLY SWITCHING SYSTEM.](#)

4. CHECK DATA MONITOR.


1. Place the access key on the driver's seat.
2. Depress the brake pedal (except for MT model) or clutch pedal (MT model), and push the push button ignition switch.
3. Using the Subaru Select Monitor, confirm the data monitor [STSW signal monitor] of [Keyless Access with Push Button Start] when pressing the push button ignition switch.
 [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Data Monitor.](#)

Note:

If it is difficult to confirm, press the push button ignition switch for approximately five seconds longer.

Does the data change from OFF → ON?


Yes

 [Go to 10.](#)

No


 [Go to 5.](#)

5. CHECK DATA MONITOR.


Using the Subaru Select Monitor, check the data monitor [Shift P Signal] of [Keyless Access with Push Button Start].  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Data Monitor.](#)

Is ON displayed in parking position, and OFF displayed in other positions?

Yes


 [Go to 6.](#)

No

 [Go to 11.](#)


6. CHECK DATA MONITOR.




Using the Subaru Select Monitor, check the data monitor [Stop Light Switch] of [Keyless Access with Push Button Start].  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Data Monitor.](#)

Is ON displayed when brake pedal depressed, and OFF displayed when brake pedal not depressed?

Yes


 [Go to 7.](#)

No

 [Go to 13.](#)

7. CHECK DATA MONITOR.




Using the Subaru Select Monitor, check the data monitor [Neutral SW/Clutch SW] of [Keyless Access with Push Button Start].  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Data Monitor.](#)

Except for MT model: is ON displayed in parking and neutral position and OFF displayed in other positions? MT model: is ON displayed when clutch pedal depressed and OFF displayed when clutch pedal not depressed?

Yes

 [Go to 8.](#)

No

 [Go to 15.](#)


8. CHECK STEERING LOCK.



Operate the push button ignition switch to perform the power supply switching and check steering lock condition during ACC-ON condition.

Is the steering lock in unlocked condition?

Yes

 [Go to 9.](#)

No

Perform the diagnostics according to the symptom for steering lock system in General Diagnostic Table. [🔗 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>General Diagnostic Table>INSPECTION > STEERING LOCK SYSTEM.](#)

9. CHECK KEYLESS ACCESS CM.

1. Turn the ignition switch to OFF.
2. Disconnect the ECM connector.
3. Using a tester, measure the voltage between the ECM connector and chassis ground in the following procedures.
 1. Press the push button ignition switch with the brake pedal depressed (MT model: clutch pedal depressed). (Measure within 10 seconds.)
 2. Release the push button ignition switch from the condition of step 1. above.

Connector & terminal

(B572) No. 13 (+) — Chassis ground (-):

Does the value change from 1 V or less to +B-2 V or more in the step 1, and return to 1 V or less in the step 2?

Yes

Perform the diagnosis for engine system. [🔗 Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostics for Engine Starting Failure.](#) [🔗 Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostics for Engine Starting Failure.](#)

No

Replace the keyless access CM. [🔗 Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

10. CHECK DATA MONITOR.

1. Connect the disconnected connectors.
2. Using the Subaru Select Monitor, check the data monitor [Engine start permission request reception status] of [Keyless Access with Push Button Start]. [🔗 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Data Monitor.](#)

Is "Reception" displayed with ignition switch ON, and "Not yet received" displayed in other positions?

Yes

Perform the diagnosis for engine system. [🔗 Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Diagnostics for Engine Starting Failure.](#) [🔗 Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Diagnostics for Engine Starting Failure.](#)

No

Replace the keyless access CM. [🔗 Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

11. CHECK "P" RANGE SWITCH.


1. Turn the ignition switch to OFF.
2. Disconnect the AT shift lever connector.
3. Using a tester, check the continuity of "P" range switch.

Connector & terminal


(B116) No. 1 — (B116) No. 2:

Does it change from continuity \longleftrightarrow no continuity according to shift lever operation?

Yes

 [Go to 12.](#)

No

Replace the "P" range switch.  [Ref. to CONTROL SYSTEMS>AT Shift Lock Solenoid and "P" Range Switch>REMOVAL.](#)

12. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the keyless access CM connector.
3. Using a tester, check continuity between the keyless access CM connector and the AT select lever connector, and between the AT select lever connector and chassis ground.


Connector & terminal

(B116) No. 1 — (B574) No. 25:

(B116) No. 2 — Chassis ground:

Is there continuity?

Yes

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

No

Repair or replace the harness.

13. CHECK STOP LIGHT SWITCH.

1. Turn the ignition switch to OFF.
2. Disconnect the stop light switch connector.
3. Using a tester, check continuity of the stop light switch connector.


Connector & terminal

(B65) No. 1 — No. 2:


Does it change from continuity \longleftrightarrow no continuity according to brake pedal operation?



Yes

 [Go to 14.](#)

No

Replace the stop light switch.  [Ref. to BRAKE>Stop Light Switch>REMOVAL.](#)

14. CHECK HARNESS.



1. Turn the ignition switch to OFF.
2. Using a tester, check continuity between the keyless access CM connector and the stop light switch connector, and between the stop light switch connector and fuse.


Connector & terminal

(B572) No. 18 — (B65) No. 2:

(B65) No. 1 — F/B fuse No. 8:

Is there continuity?

Yes

Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

No

Repair or replace the harness.


15. CHECK INHIBITOR SWITCH.



Check the inhibitor switch.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Inhibitor Switch>INSPECTION.](#)

Is the check result OK?

Yes

 [Go to 16.](#)

No

Replace the inhibitor switch.

16. CHECK HARNESS.



1. Turn the ignition switch to OFF.
2. Disconnect the inhibitor switch connector.
3. Using a tester, check continuity between the keyless access CM connector and inhibitor switch connector.

Connector & terminal

Non-turbo model

(B572) No. 5 — (B12) No. 16:

(B12) No.15 — Starter motor:


Turbo model

(B572) No. 5 — (B12) No. 12:

(B12) No.11 — Starter motor:

Is there continuity?

Yes

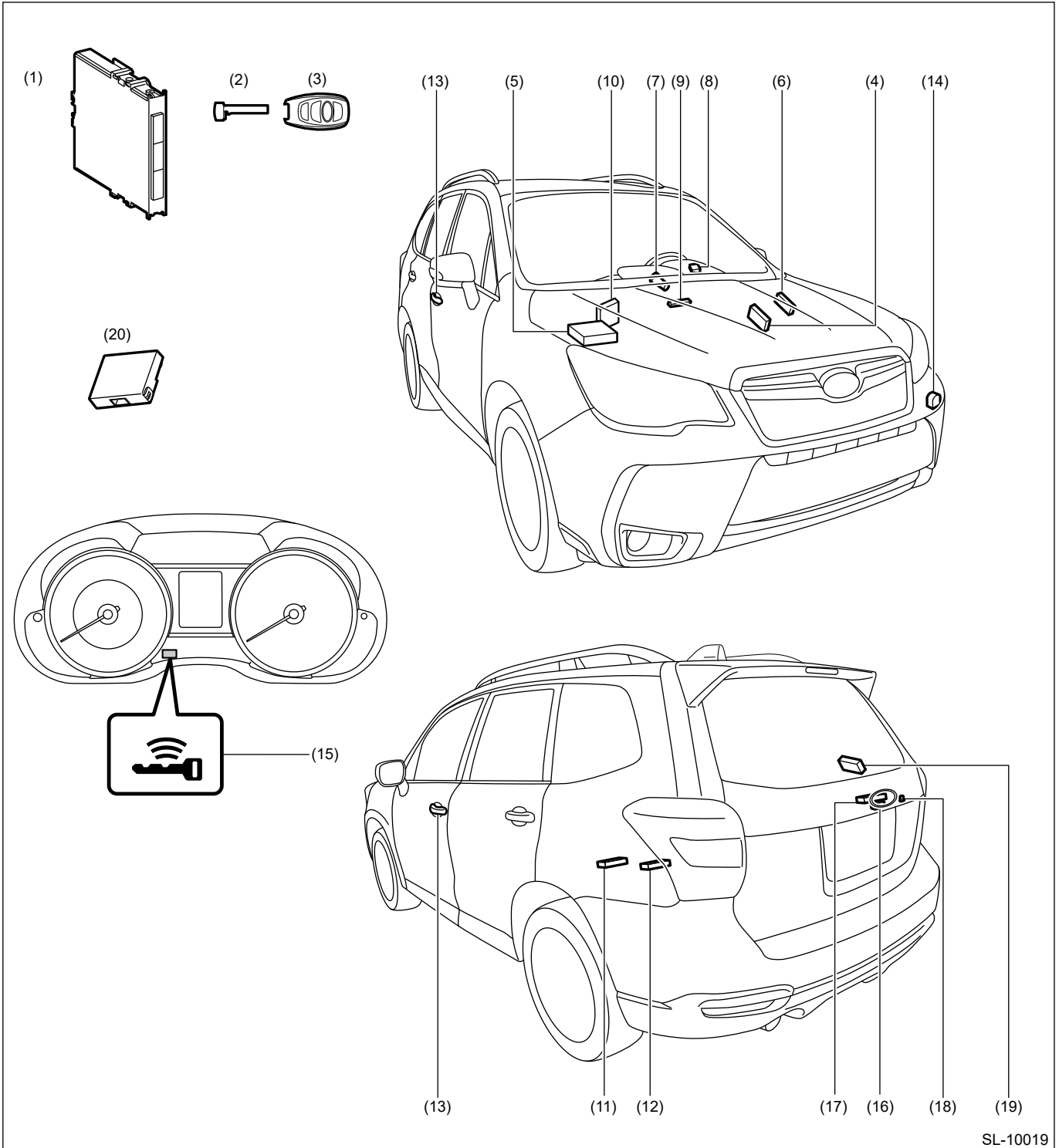
Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.](#)

No

Repair or replace the harness.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Electrical Component Location

LOCATION



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- | | | |
|-----------------------|----------------------------|-------------------------------|
| (1) Keyless access CM | (8) Steering lock CM | (15) Access key warning light |
| (2) Mechanical key | (9) Front interior antenna | (16) Rear gate opener button |
| (3) Access key | (10) ECM (non-turbo model) | (17) Rear exterior antenna |

- | | | |
|---------------------------------|--|--|
| (4) TCM | (11) Center interior antenna | (18) Rear lock button |
| (5) ECM (turbo model) | (12) Rear interior antenna | (19) Receiver |
| (6) Body integrated unit | (13) Front outer handle (front exterior antenna)
- Touch sensor (lock)
- Touch sensor (unlock) | (20) ID code box
(For C0 and C5 only) |
| (7) Push button ignition switch | (14) Access buzzer | |

CAUTION

1. SRS AIRBAG SYSTEM


The airbag system wiring harness is routed near the keyless access with push button start system.

Caution:

- **Do not use the electrical test equipment on all airbag system wiring harnesses and connectors.**
- **Be careful not to damage the wiring harness of the airbag system when servicing the keyless access with push button start system.**

2. KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM

Note:

- **Using the function setting (ECM customizing), check that the keyless access system is not OFF.**  [Ref. to SECURITY AND LOCKS>Function Setting \(Customize\)>OPERATION.](#)
- **The dark current is approx. 400 mA if there is communication between the vehicle and access key.**
- **The dark current is approx. 40 mA if there is no communication between the vehicle and access key.***

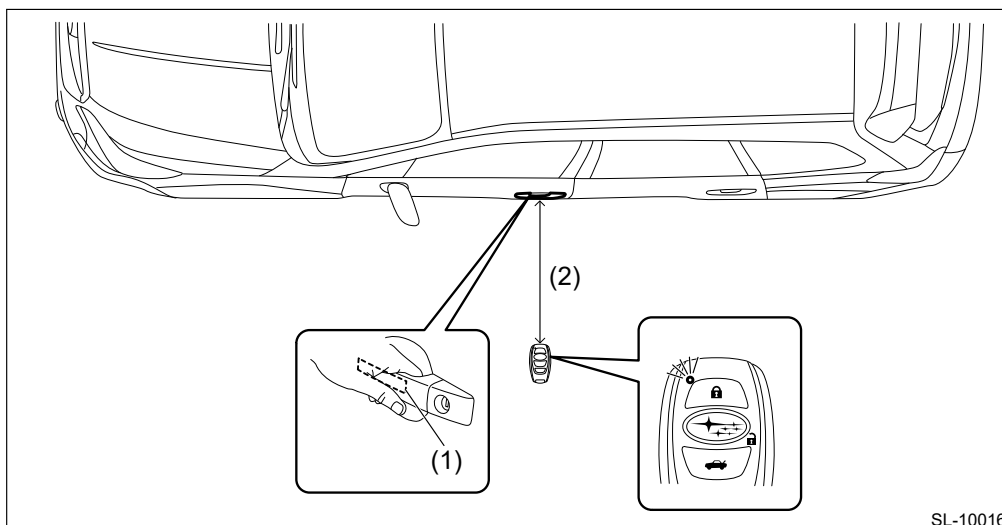
* **No communication with the vehicle means that the keyless access function has been cancelled or that the access key has not been near the vehicle for 15 minutes or more after door locking.**

1. Keyless access door unlock function check

- (1) While carrying the access key with all doors locked by keyless lock operation, check the followings: When you grip the outer handle of the driver's front door, the door unlocks; When you grip the outer handle of the passenger's front door, all doors unlock, and then the answer-back function operates (hazard lights blink twice). (Setting can be changed by customizing of the body integrated unit.)
- (2) In the keyless access door unlock detection area, hold the access key at the same height as the outer handle (approx. 80 cm from the ground) and in the direction shown in the figure, and check that the vehicle becomes unlock mode [access key LED (red) blinks] at 40 to 80 cm from the vehicle.

Note:

Check the access key battery if the LED (red) does not illuminates when the access key button is pressed.  [Ref. to SECURITY AND LOCKS>Access Key>INSPECTION.](#)



2. Keyless access door lock function check

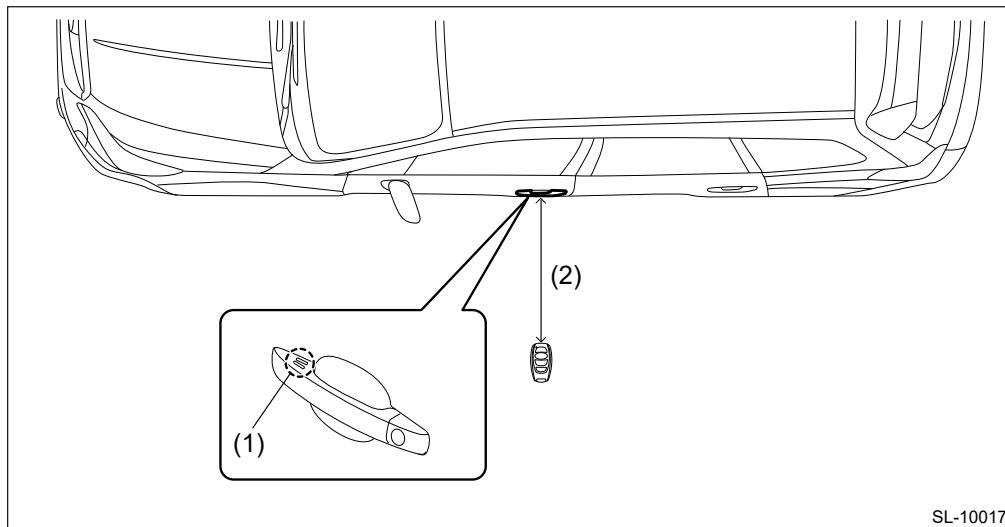
- (1) When carrying the access key outside of the vehicle with all doors closed and unlocked, check that when

the touch sensor (lock) on the surface of door outer handle of front door is touched, all doors will lock and the answer-back function operates (hazard light blinks once).

Caution:

If the access key is within the vehicle but not within the detection area (in the instrument panel, on the rear tray, in the glove box, on the floor, in the door trim pocket or in the luggage room), then lockout protection will not function when the doors are locked and the access key will be locked into the vehicle.

- (2) To check the operating range of keyless access door lock, hold the access key at a height of 10 cm below the bottom edge of the door glass (approx. 80 cm above the ground), point it in the direction shown in the figure at a distance of approx. 30 cm from the vehicle, and check that all doors lock and the answer-back function operates (hazard light blinks once) when you touch the touch sensor (lock).



- (3) Check the passenger's side door in the same manner.

Note:

- **When the door does not lock even if the touch sensor (lock) is touched, touch the touch sensors (lock) located at the upper and lower part of the door handle by holding with your hand.**
- **Since communication is not possible within close range (20 cm or less) of the door outer handle, the access key may not operate if you touch the touch sensor (lock) with the same hand you are holding the access key.**
- **If the lockout prevention buzzer sounds, it is possible that the interior transmitter has radio wave leakage.**

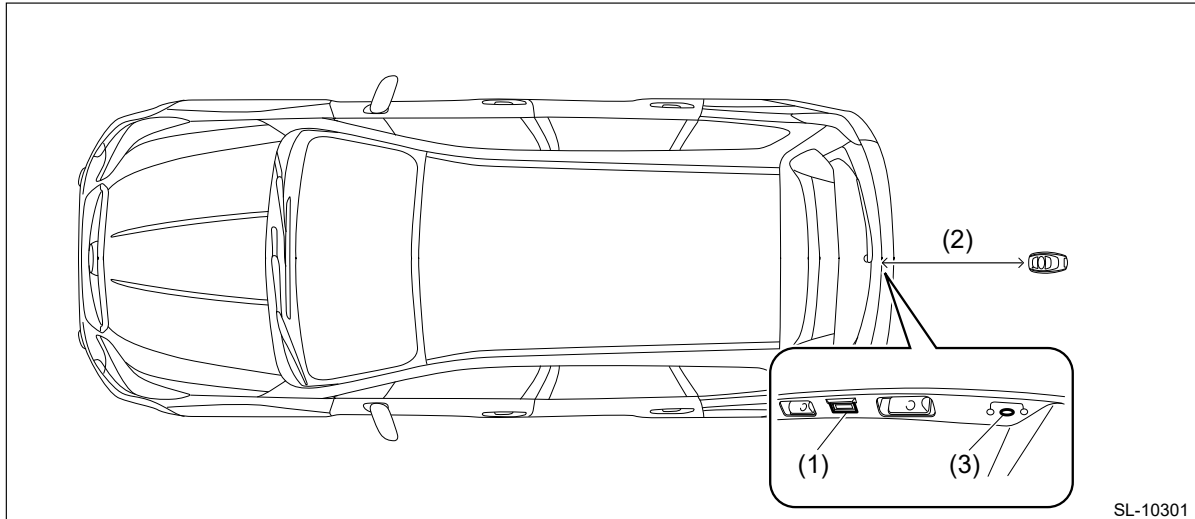
3. Check of the keyless access rear gate function

- (1) With the rear gate locked, check that the all doors unlock and rear gate opens simultaneously and the answer-back function operates (hazard light blinks twice) when you press the rear gate opener button while carrying the access key.

Note:

- **For vehicles with power rear gate, the rear gate opens automatically. Holding down the button switches the operation to manual mode.**
- **The hazard light for the answer-back function blinks twice on vehicles without power rear gate, and four times on vehicles with power rear gate.**

- (2) To check the range of keyless access rear gate open operation, hold the access key behind and in the center of the vehicle at the same height as the rear gate opener button (90 cm from the ground), point it in the direction shown in the figure at a distance of 40 to 80 cm from the vehicle, and check that all doors unlock, the rear gate opens, and the answer-back function operates (hazard light blinks twice) when you press the rear gate opener button.



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(3) With the rear gate unlocked, check that all doors lock and the answer-back function operates (hazard light blinks once) when you press the rear lock button while carrying the access key.

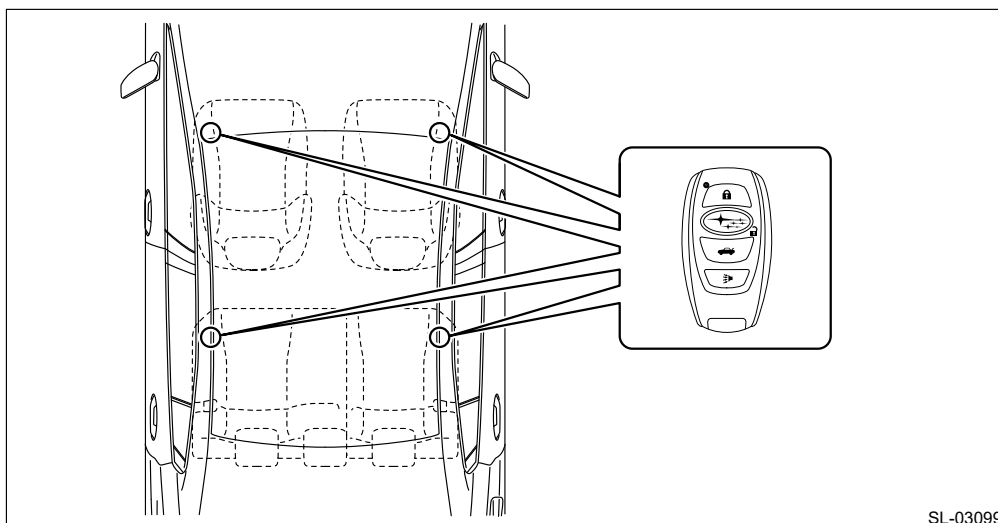
4. Keyless access ignition switching function check

(1) With the ignition OFF, enter the vehicle while carrying the access key. With the shift lever in the P range, check that the push button ignition switch indicator is illuminated in green when you depress the brake pedal, and check that the engine starts when you press the push button ignition switch while the indicator illuminated in green.

(2) While carrying the access key, check that the status changes as follows each time you press the push button ignition switch without depressing the brake pedal: 'Ignition OFF'→'ACC ON'→'Ignition ON'→'Ignition OFF'. However, if the shift lever is a range other than the P range and the push button ignition switch is pressed from ignition ON, then the status does not change to ignition OFF and instead will change to ACC ON.

(3) After the vehicle has stopped, press the push button ignition switch and ignition is turned OFF (engine stopped • all power supplies OFF). However, if the shift lever is in any range except for the P range and the push button ignition switch is pressed with the vehicle stopped, then the ignition is not turned OFF and instead the power supplies changes to ACC ON. Check that the steering lock operates if the door is opened in the ignition OFF state (shift P range).

(4) To check the range of the keyless access ignition operation, check that the engine can start when you set the access key at the check position on the seat in the direction indicated in the figure.



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Caution:

The access key may not be correctly detected even though it is within the detection area within the passenger room, if it is in the instrument panel, on the rear tray, in the glove box, on the floor, in the door trim pocket or in the luggage room.

Note:

Perform the check multiple times, once each with the access key positioned on the driver's seat, on the passenger's seat, and on the rear seat in 2 locations.


5. Lockout protection function check (in the passenger room)

Caution:

Open one of the windows before performing this check in order to prevent the key from being locked inside the vehicle.

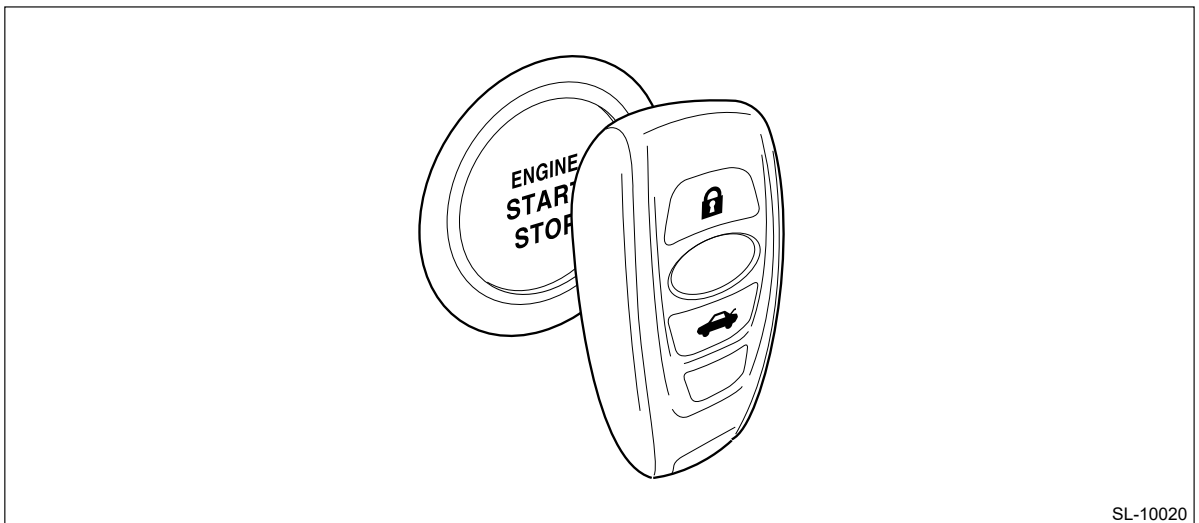
- (1) Position the access key on the driver's or passenger's seat.
- (2) Close all doors. (With all doors unlocked)
- (3) Check that the doors do not lock and the lockout protection buzzer (exterior) sounds for 2 seconds when you touch the touch sensor (lock) of either the driver's or passenger's door.

6. Keyless access cancel function check

- (1) After setting the keyless access cancel function, check that all keyless access and start system (keyless access) functions are inoperable. (For cancel setting, refer to  [Ref. to SECURITY AND LOCKS>Function Setting_\(Customize\)>OPERATION..](#))

Note:

When keyless access is cancelled, door lock and unlock can be operated by access key button operation and the starter system can be operated by passing the access key over the push button ignition switch with the access key button toward you.



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7. Access key diagnostic mode

- (1) Connect the Subaru Select Monitor and select [Diagnosis] on [Start] display.
- (2) On [Vehicle selection] display, input the target vehicle information and select [OK].
- (3) On [Main Menu] display, select [Each System].
- (4) On [Select System] display, select [Keyless Access with Push Button Start], and then select [Enter].
- (5) On [Select Function] display, select [Work Support].
- (6) On [Work Support] display, select [Keyless access system check].
- (7) Select the transmitter to check from the items.
- (8) Check that the door lock buzzer sounds (short blips, a continuous beeping sound for the center room antenna) when the access key is near the selected transmitter or antenna.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>STSSM4</p>	<p>— (Newly adopted tool)</p>	<p>SUBARU SELECT MONITOR 4</p>	<p>Used for setting of each function and troubleshooting for electrical system.</p> <p>Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".</p>








2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.
Oscilloscope	Used for measuring the waveform.



KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > General Diagnostic Table

INSPECTION

1. IMMOBILIZER SYSTEM


Symptoms	Note
Engine does not start	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > ENGINE DOES NOT START.
	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2784 ANTENNA CIRCUIT (PUSH ENGINE SWITCH).
	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B278A PUSH ENGINE SWITCH POWER SUPPLY CIRCUIT.
	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2785 LIN COMMUNICATION.
	Check the brake switch.  Ref. to BRAKE>Stop Light Switch>INSPECTION.
	Check the parking switch signal.  Ref. to CONTROL SYSTEMS>AT Shift Lock Solenoid and "P" Range Switch>INSPECTION.
	Check DTC of ECM.
Cannot register the immobilizer.	Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER".
Engine does not start with the remote engine starter.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2779 REMOTE CONTROL ENGINE STARTER COLLATION.


2. KEYLESS ACCESS SYSTEM

Symptoms	Reference
All doors cannot be locked/unlocked with keyless access.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > KEYLESS ACCESS LOCK/UNLOCK CANNOT BE PERFORMED FROM ANY OF THE DOORS.
Cannot lock with keyless access from the driver's door.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CANNOT LOCK WITH KEYLESS ACCESS FROM THE DRIVER'S DOOR.




Cannot lock/unlock from the driver's door with keyless access.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CANNOT LOCK/UNLOCK WITH KEYLESS ACCESS FROM THE DRIVER'S DOOR.
Cannot unlock from the driver's door with keyless access.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CANNOT UNLOCK WITH KEYLESS ACCESS FROM THE DRIVER'S DOOR.
Cannot unlock from the passenger's door with keyless access.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CANNOT UNLOCK WITH KEYLESS ACCESS FROM THE PASSENGER'S DOOR.
Cannot lock/unlock from the passenger's door with keyless access.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CANNOT LOCK/UNLOCK WITH KEYLESS ACCESS FROM THE PASSENGER'S DOOR.
Cannot lock from the passenger's door with keyless access.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CANNOT LOCK WITH KEYLESS ACCESS FROM THE PASSENGER'S DOOR.
Keyless access passenger room buzzer does not sound.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > KEYLESS ACCESS PASSENGER ROOM BUZZER DOES NOT SOUND.
Keyless access external buzzer does not beep.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > KEYLESS ACCESS EXTERNAL BUZZER DOES NOT BEEP.
Interior collation does not function.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > INTERIOR COLLATION DOES NOT FUNCTION.
Rear gate cannot be unlocked with the rear gate opener button.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > REAR GATE CANNOT BE UNLOCKED WITH THE REAR GATE OPENER BUTTON.
Rear gate can not be locked when using the rear lock button.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CAN NOT LOCK WHEN USING THE REAR LOCK BUTTON.

3. STEERING LOCK SYSTEM

Symptoms	Reference
The steering lock cannot be	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON

released (Cannot start the engine).	START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE STEERING LOCK IS NOT RELEASED.
The steering lock does not operate.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE STEERING LOCK DOES NOT OPERATE.

4. POWER SUPPLY SWITCHING SYSTEM

Symptoms	Reference
Power will not turn ON (both accessory and ignition).	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > POWER WILL NOT TURN ON (BOTH ACCESSORY AND IGNITION).
Power will not turn ON (accessory only).	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > POWER WILL NOT TURN ON (ACCESSORY DOES NOT TURN ON, BUT IGNITION TURNS ON).
Power will not turn ON (ignition only).	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > POWER WILL NOT TURN ON (ACCESSORY TURNS ON, BUT IGNITION DOES NOT TURN ON).

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Keyless Access System Check

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Keyless Access with Push Button Start], and then select [Enter].
5. On [Select Function] display, select [Work Support].
6. On [Work Support] display, select [Keyless access system check].
7. Select a transmitter to be checked.

Data	Customize setting	Remarks
Keyless access system check	Driver's External Transmitter + Interior Tuner	When the setting content on the left is selected, the access key is neared to the selected transmitter (access antenna) and collation matches, the buzzer will sound.
	Passenger's External Transmitter + Interior Tuner	
	Fr Interior Transmitter + Interior Tuner	
	Rr internal transmitter - internal tuner	
	R gate internal transmitter - internal tuner	
	R gate external transmitter - internal tuner	
	Immobilizer amplifier transmission	
Collation result history Clear	Execution	
	—	

Note:







For detailed operation procedures, refer to "Application help".





KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > List of Diagnostic Trouble Code (DTC)






LIST






1. KEYLESS ACCESS SYSTEM

DTC	Item	Content of diagnosis	Note
U0073	CAN FAILURE, BUS 'OFF' DETECTION	Detected when CAN line abnormality is detected.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	Detected when CAN data from the engine control module (ECM) does not arrive.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0101	LOST COMMUNICATION WITH TCM	Detected when CAN data from TCM does not arrive.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Detected when CAN data from VDC does not arrive.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	Detected when CAN data from BIU does not arrive.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Detected when CAN data from meter does not arrive.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST




			COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	Detected when there is malfunction in CAN data from the engine control module (ECM).	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".
U0422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE	Detected when CAN data from BIU is abnormal.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE.
B1242	WIRELESS TUNER	When short circuit occurs in harness between keyless access CM and receiver.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1242 WIRELESS TUNER.
B2271	IGN RELAY CONTROL CIRCUIT	<ul style="list-style-type: none"> • When malfunction is detected in IG1 and IG2 drive circuits in the keyless access CM. • When malfunction is detected in IG hold circuit in the keyless access CM. 	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2271 IGN RELAY CONTROL CIRCUIT.
B2274	ACC RELAY CONTROL CIRCUIT	When malfunction is detected in ACC relay drive circuit in the keyless access CM or external circuit.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2274 ACC RELAY CONTROL CIRCUIT.
B2275	ENGINE START REQUEST CONTROL CIRCUIT	<ul style="list-style-type: none"> • When malfunction is detected in engine start permission signal 	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble

		<p>output circuit in the keyless access CM.</p> <ul style="list-style-type: none"> When malfunction is detected in external engine start permission signal circuit. 	Code (DTC)>DTC B2275 ENGINE START REQUEST CONTROL CIRCUIT.
B2276	ACC RELAY OFF SIGNAL	<p>When input error occurs in accessory relay cut input signal of keyless access CM.</p>	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2276 ACC RELAY OFF SIGNAL.
B2277	SUBMERGING CIRCUIT	<p>When the water-submersion detection circuit integrated into the keyless access CM detects the water submersion.</p>	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2277 SUBMERGING CIRCUIT.
B2282	VEHICLE SPEED SIGNAL CORRELATION	<p>When the vehicle speed signal transmitted from the combination meter via solid line and the vehicle speed signal transmitted via CAN communication line do not match.</p>	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2282 VEHICLE SPEED SIGNAL CORRELATION.
B2283	VEHICLE SPEED SENSOR	<p>Either of the following malfunctions is detected. (Vehicle speed sensor failure is detected.)</p> <ul style="list-style-type: none"> Vehicle speed signal failure detection 1: Excessive deceleration detection Vehicle speed signal failure detection 2: Engine speed 	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2283 VEHICLE SPEED SENSOR.




		interlock detection	
B2284	BRAKE SIGNAL CORRELATION	When the brake signal transmitted via solid line and the brake signal transmitted via CAN communication line do not match. (AT model only)	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2284 BRAKE SIGNAL CORRELATION.
B2285	STEERING LOCK POSITION SIGNAL CORRELATION	When the steering lock position signal transmitted from the steering lock CM via solid line and the steering lock position signal transmitted via LIN communication system do not match.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2285 STEERING LOCK POSITION SIGNAL CORRELATION.
B2286	ENGINE SPEED SIGNAL(WITHOUT AUTO START STOP)	When the engine speed signal transmitted from the ECM via solid line and the engine speed signal transmitted via CAN communication line do not match. (Without Auto Start Stop)	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2286 ENGINE SPEED SIGNAL(WITHOUT AUTO START STOP).
B2779	REMOTE CONTROL ENGINE STARTER COLLATION	When the keyless access CM does not respond to engine start even when the remote control engine starter is ON, or when there is a code mismatch.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2779 REMOTE CONTROL ENGINE STARTER COLLATION.
B2781	STEERING LOCK CM CONTROL CIRCUIT	<ul style="list-style-type: none"> When malfunction is detected in lock/unlock position detection sensor. 	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2781 STEERING LOCK CM CONTROL CIRCUIT.


		<ul style="list-style-type: none"> When the open or short circuit in the steering lock motor drive circuit is detected. 	
B2782	STEERING LOCK DRIVE REQUEST SIGNAL CORRELATION	When the open or short circuit in the steering lock motor power supply circuit is detected.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2782 STEERING LOCK DRIVE REQUEST SIGNAL CORRELATION.
B2784	ANTENNA CIRCUIT (PUSH ENGINE SWITCH)	When open or short circuit occurs in the antenna coil.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2784 ANTENNA CIRCUIT (PUSH ENGINE SWITCH).
B2785	LIN COMMUNICATION	When the keyless access CM detected the collation system LIN bus communication error three times in a row.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2785 LIN COMMUNICATION.
B2786	STEERING LOCK CM COMMUNICATION	When communication between keyless access CM and steering lock CM is interrupted for a set amount of time.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2786 STEERING LOCK CM COMMUNICATION.
B2788	IGN SIGNAL CORRELATION (STEERING LOCK CM)	When mismatch occurs in the IG1 input of the steering lock CM for both LIN communication line input and solid line input.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2788 IGN SIGNAL CORRELATION (STEERING LOCK CM).
B2789	ID CODE BOX COMMUNICATION	<ul style="list-style-type: none"> When communication between keyless access CM and ID code box is interrupted for a 	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2789 ID CODE BOX COMMUNICATION.

		<p>set amount of time.</p> <ul style="list-style-type: none"> • Open or short circuit in the wiring harness between keyless access CM and ID code box 	
B278A	PUSH ENGINE SWITCH POWER SUPPLY CIRCUIT	When the power supply circuit of the push button ignition switch is shorted to ground.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B278A PUSH ENGINE SWITCH POWER SUPPLY CIRCUIT.
B278D	ID CODE BOX JUDGMENT CIRCUIT	When ID code box setting is set to OFF, ID code box LIN signal is received.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B278D ID CODE BOX JUDGMENT CIRCUIT.
B2790	ID CODE BOX CIRCUIT	An error has occurred inside the ID code box.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2790 ID CODE BOX CIRCUIT.
B27A1	DRIVER SIDE EXTERNAL ANTENNA OPEN	When open circuit occurs in the harness between keyless access CM and driver's side front door outer handle.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B27A1 DRIVER SIDE EXTERNAL ANTENNA OPEN.
B27A2	PASSENGER SIDE EXTERNAL ANTENNA OPEN	When open circuit occurs in the harness between keyless access CM and passenger's side front door outer handle.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B27A2 PASSENGER SIDE EXTERNAL ANTENNA OPEN.
B27A5	FRONT INTERNAL ANTENNA OPEN	When open circuit occurs in the harness between keyless access CM	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble

		and front interior antenna.	Code (DTC)>DTC B27A5 FRONT INTERNAL ANTENNA OPEN.
B27A6	REAR INTERNAL ANTENNA OPEN	When open circuit occurs in the harness between keyless access CM and rear interior antenna.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B27A6 REAR INTERNAL ANTENNA OPEN.
B27A7	TRUNK/REAR GATE INTERNAL ANTENNA OPEN	When open circuit occurs in the harness between keyless access CM and rear interior antenna.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B27A7 TRUNK/REAR GATE INTERNAL ANTENNA OPEN.
B27A8	TRUNK/REAR GATE EXTERNAL ANTENNA OPEN	When open circuit occurs in the harness between keyless access CM and rear exterior antenna.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B27A8 TRUNK/REAR GATE EXTERNAL ANTENNA OPEN.

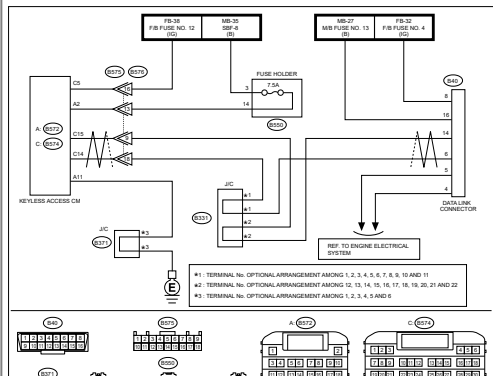
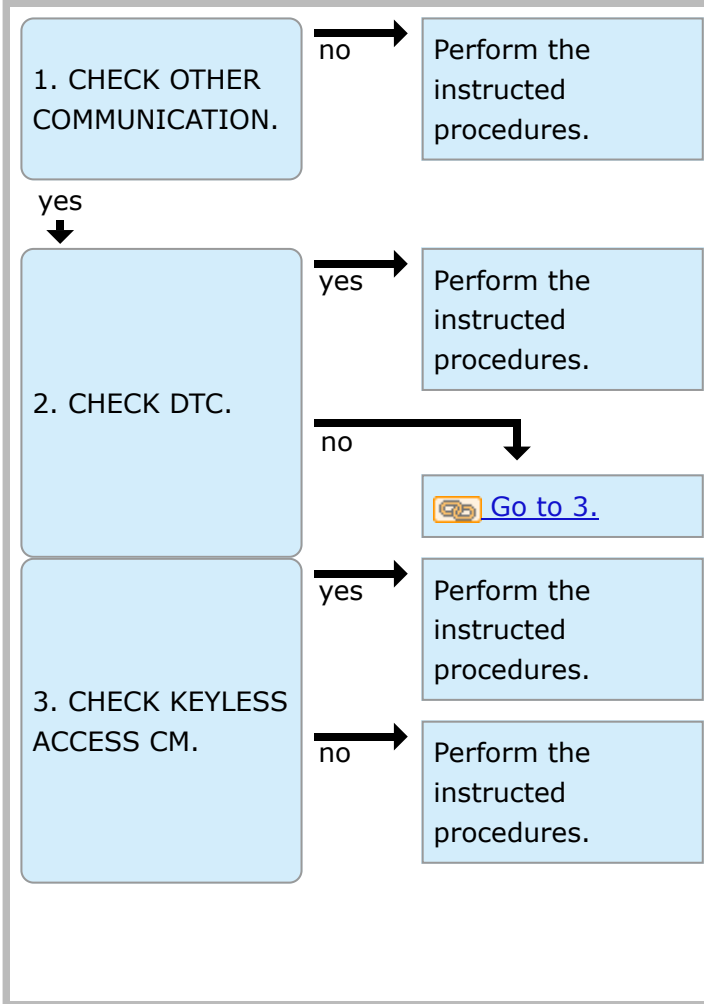
2. IMMOBILIZER CM

DTC	Item	Content of diagnosis	Note
B1571	REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM)	Reference code mismatch occurs between keyless access CM (model without ID code box) or ID code box (model with ID code box) and ECM.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1571 REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM).
B1572	IMM CIRCUIT EXCEPT ANTENNA CIRCUIT	Communication error occurs between keyless access CM (model without ID code box) or ID code box (model with ID code box) and ECM.	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1572 IMM CIRCUIT EXCEPT ANTENNA CIRCUIT.
B1576	EGI CONTROL MODULE EEPROM	ECM malfunctioning	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble

			Code (DTC)>DTC B1576 EGI CONTROL MODULE EEPROM.
B1577	IMM CONTROL MODULE EEPROM	Malfunction occurs in keyless access CM (model without ID code box) or ID code box (model with ID code box).	 Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1577 IMM CONTROL MODULE EEPROM.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Subaru Select Monitor COMMUNICATION FOR INITIALIZING IMPOSSIBLE

CAUTION/NOTE INTRO



Note:
 Confirm that the LAN system is working before the diagnosis.
 Subaru Select Monitor communication is open or shorted.

START

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Subaru Select Monitor **OPERATION**


For detailed operation procedures, refer to "Application help".

PROCEDURE

Caution:


- **Subaru Select Monitor is required for reading DTC, performing diagnosis, reading current data, customizing and active test (compulsory drive).**
- **Remove foreign matter (dust, water, oil, etc.) from each control module connector during removal and installation.**
- **For model with immobilizer or model with keyless access, registration of immobilizer may be needed after the replacement of controller etc. For detailed procedure, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER".**

Note:

- **To check harness for open or short circuits, shake the suspected trouble spot or connector.**
- **Perform the diagnosis, and when the control module is replaced as a result of judgment that malfunction is the control module, re-check that the control module was actually malfunctioning. Replace to a new control module, and confirm that the malfunction is eliminated. Then, install the previously removed control module again and check that the malfunction reproduces again.**
- **Check List for Interview  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Check List for Interview.](#)**

1. CHECK PRE-INSPECTION.



Ask the customer when and how the trouble occurred using the interview check list.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Check List for Interview.](#)

Did you interview the customer?

Yes


 [Go to 2.](#)

No

Interview the customer.

2. BASIC INSPECTION (CAN DIAGNOSTIC IS NOT USED).



Check the power supply circuit of the module which might affect CAN communication problem.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>General Description>INSPECTION > INSPECTION WITHOUT USING CAN DIAGNOSTIC.](#)

Is the power supply circuit of each module that is performing CAN communication OK?

Yes

 [Go to 3.](#)

No

Repair or replace the faulty portion.

3. BASIC INSPECTION (CAN DIAGNOSTIC IS USED).

Check the registration status of the body integrated unit which might affect CAN communication problem. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>General Description>INSPECTION > INSPECTION USING CAN DIAGNOSTIC.](#)

Does the registration status of the body integrated unit match with the vehicle specification? (When the Subaru Select Monitor and the body integrated unit cannot communicate, and the registration status cannot be checked, [Go to 5.](#))

Yes

[Go to 4.](#)

No

Match the registration status of the body integrated unit with the vehicle specification.

4. CHECK COMMUNICATION FOR INITIALIZING.

Communicate with the all systems by connecting the Subaru Select Monitor.

Is the communication for initializing finished for all modules?

Yes

[Go to 5.](#)

No

Check the error of communication for initializing. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Subaru Select Monitor>COMMUNICATION FOR INITIALIZING IMPOSSIBLE.](#)

5. CHECK DTC.

1. Start the engine and read all DTCs. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Note:

When the engine does not start, perform the diagnosis for the engine start malfunction. [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Diagnostics for Engine Starting Failure.](#)

2. Record all DTCs (current malfunction and past malfunction), time stamp and freeze frame data.

Note:


For time stamp,  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>General Description>CAUTION > TIME STAMP.](#)

Is DTC U**** displayed on Subaru Select Monitor?


Yes

 [Go to 6.](#)

No


Using the diagnostics with phenomenon, perform inspection.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostics with Phenomenon.](#)

6. CHECK USING THE DTC CHECK SHEET.


Perform the inspection using the DTC check sheet.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\)>LIST > CHECK USING THE DTC CHECK SHEET.](#)

Is CAN communication line faulty?



Yes

Repair or replace the faulty portion of the harness. And then,  [Go to 7.](#)

No

Perform the diagnosis for the displayed DTCs. And then,  [Go to 7.](#)

7. PERFORM DIAGNOSIS.

1. Perform the Clear Memory Mode.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)
2. Read the DTC.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes

Repeat the Basic Diagnostic Procedure from the beginning until DTC is not shown.

No

Finish the diagnosis.

LAN SYSTEM (DIAGNOSTICS) > CAN Communication Circuit Check

INSPECTION

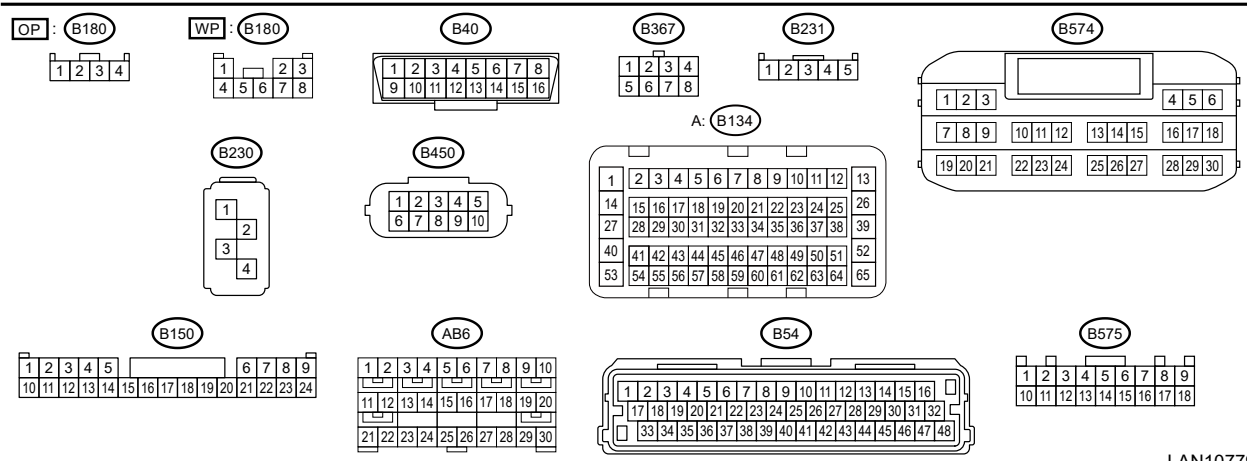
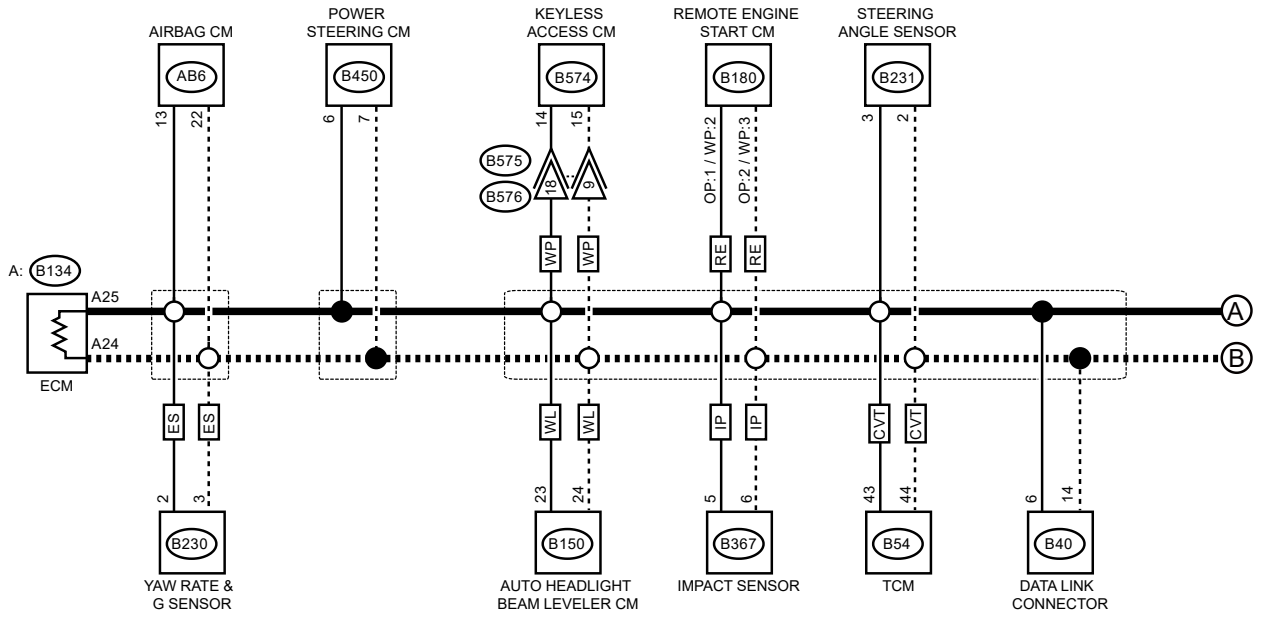
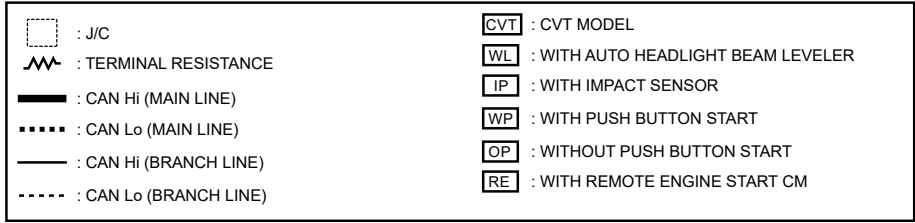
1. GROUND SHORT INSPECTION

Wiring diagram:

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)

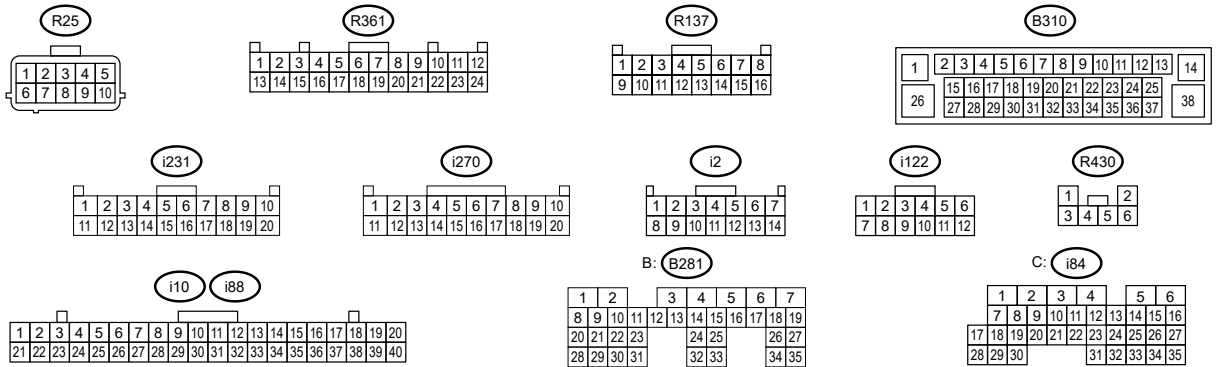
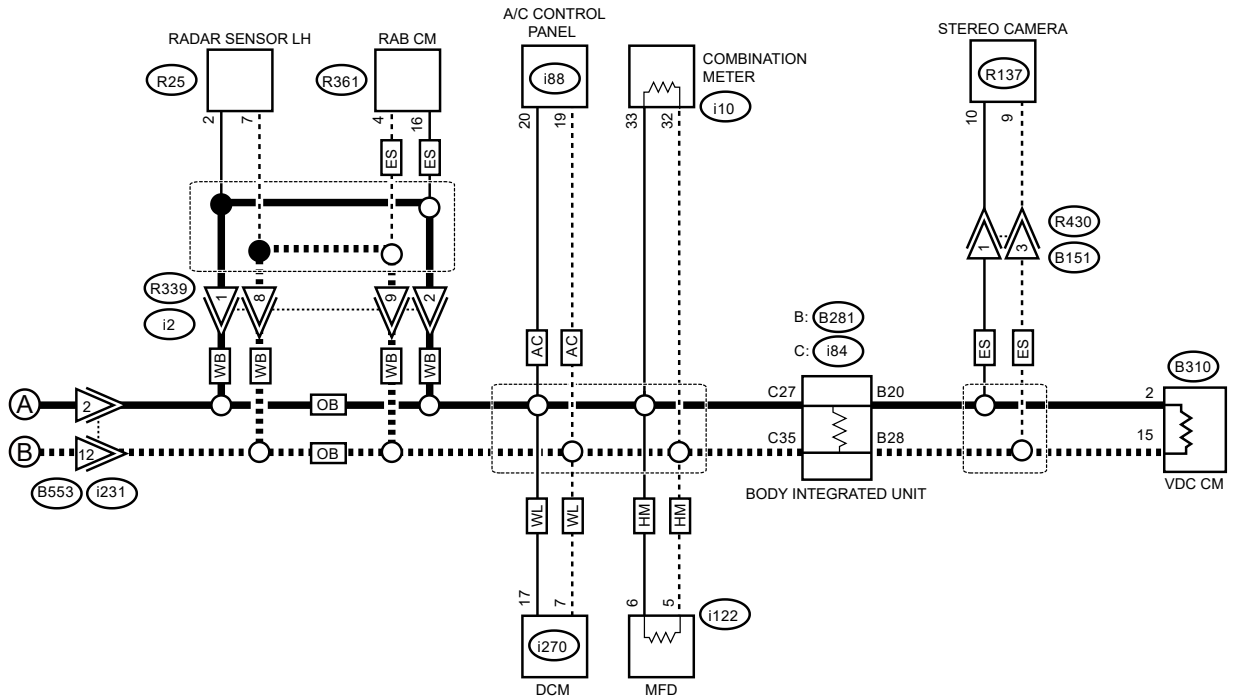
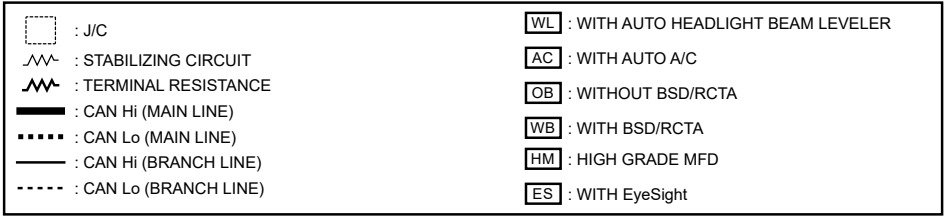
- Non-turbo model





LAN10779

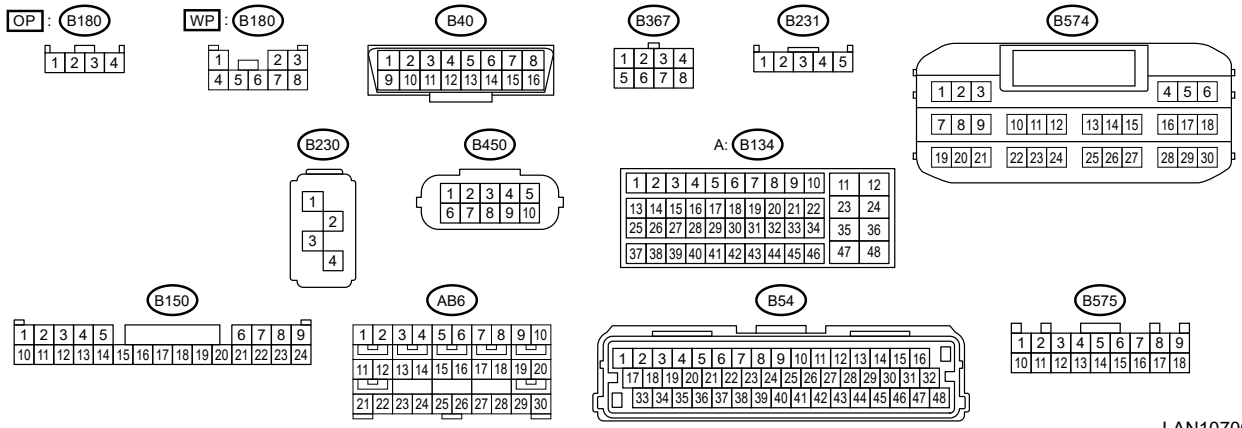
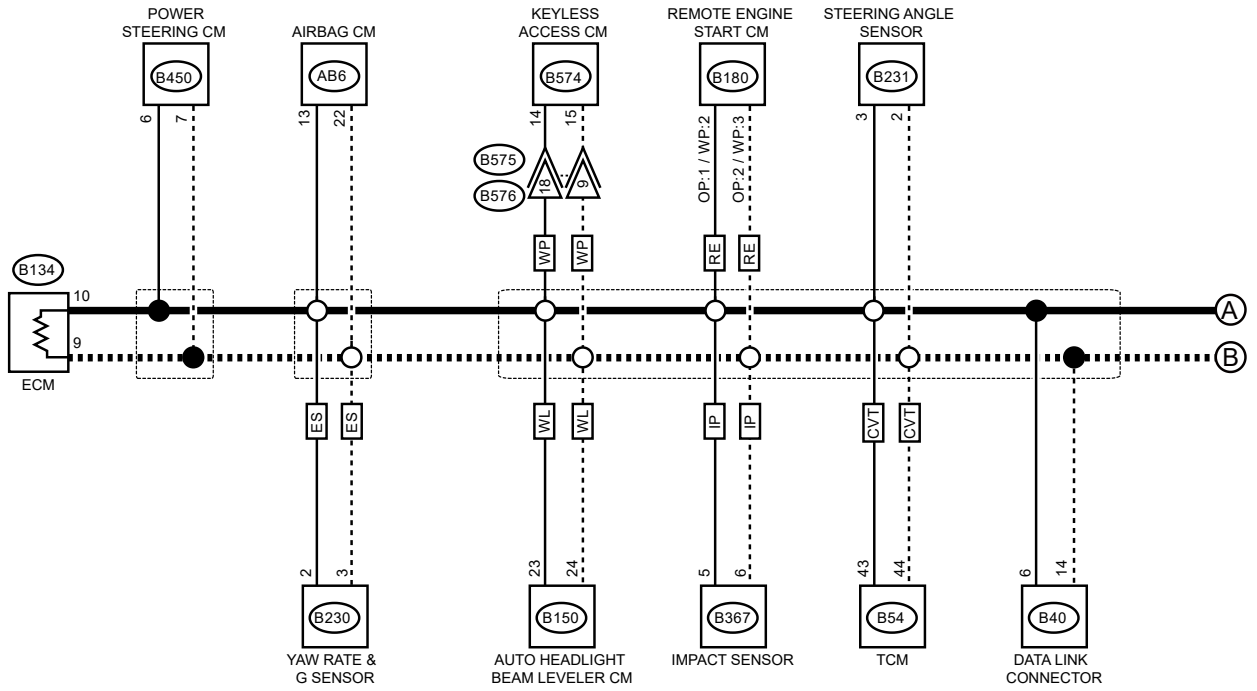
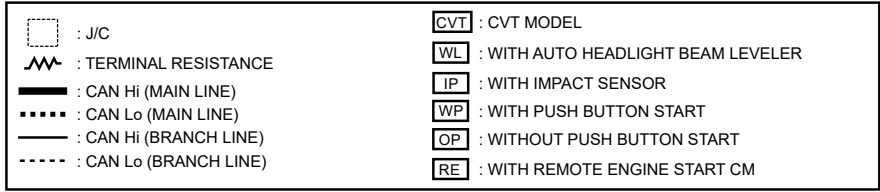




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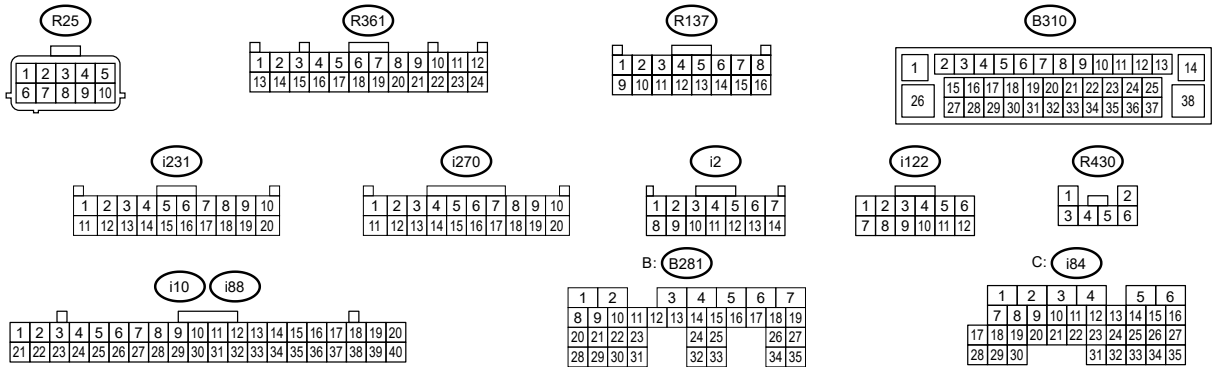
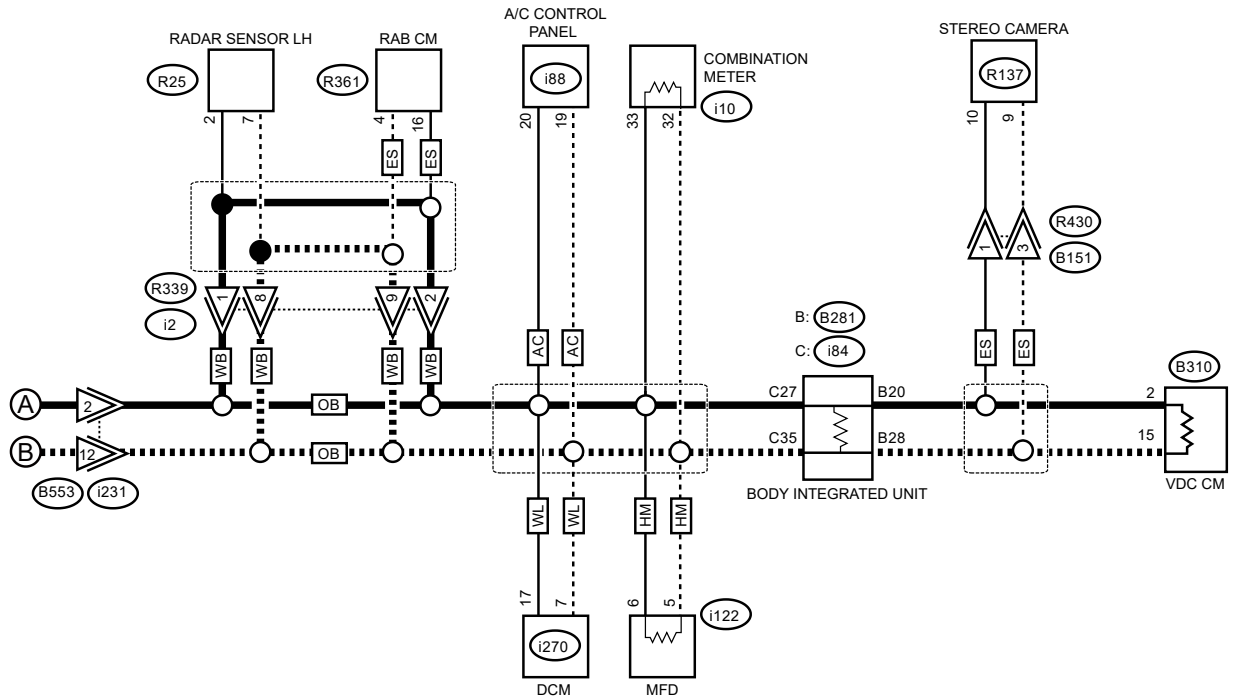
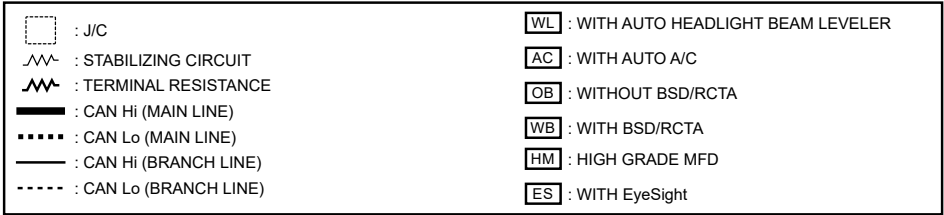
• Turbo model





LAN10706





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Note:

Main wiring harness or related lines may be shorted to ground, or shorted to ground in one of the control modules.

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.



Using the tester, measure the resistance between terminals.


Connector & terminal

(B40) No. 6 — Chassis ground:

(B40) No. 14 — Chassis ground:

Is the resistance less than 10 Ω?

Yes

 [Go to 2.](#)

No

Currently, it is normal.

2. CHECK CONTROL MODULE.

With the tester connected, disconnect control module.

Note:

Disconnect the body integrated unit at the end.

Connector & terminal

(B40) No. 6 — Chassis ground:

(B40) No. 14 — Chassis ground:

Did the resistance change to 10 Ω or more?

Yes

Replace the control module whose resistance has changed. When the value changed at disconnecting the body integrated unit,

 [Go to 3.](#)

No

Repair or replace the short circuit of the main wiring harness and related lines between body integrated unit and ECM.

3. CHECK BETWEEN MAIN WIRING HARNESES.

Using the tester, measure the resistance between terminals.

Connector & terminal

(B281) No. 20 — Chassis ground:

(B281) No. 28 — Chassis ground:

Is the resistance less than 10 Ω?

Yes


Repair or replace the short circuit of the main wiring harness and related lines between VDC CM and body integrated unit.

No

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL.](#)

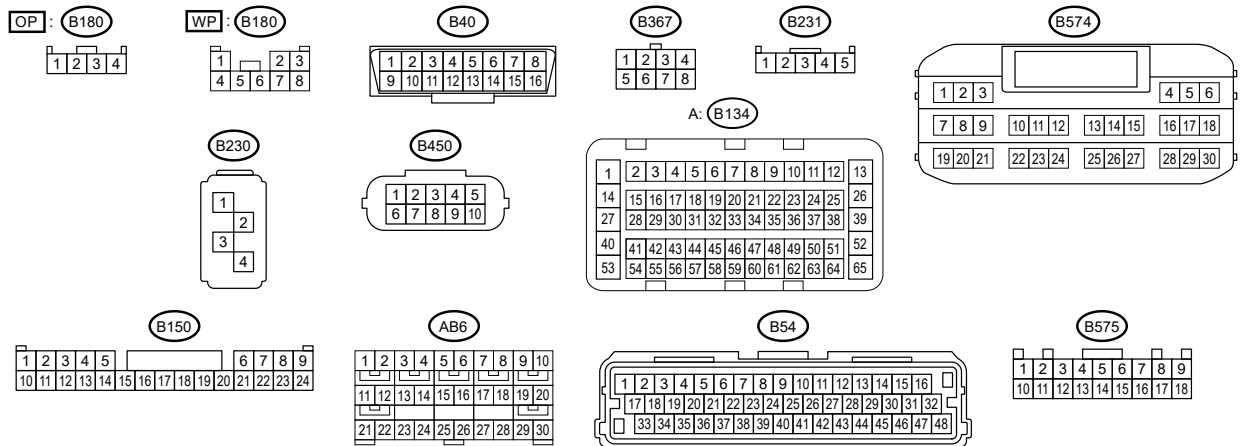
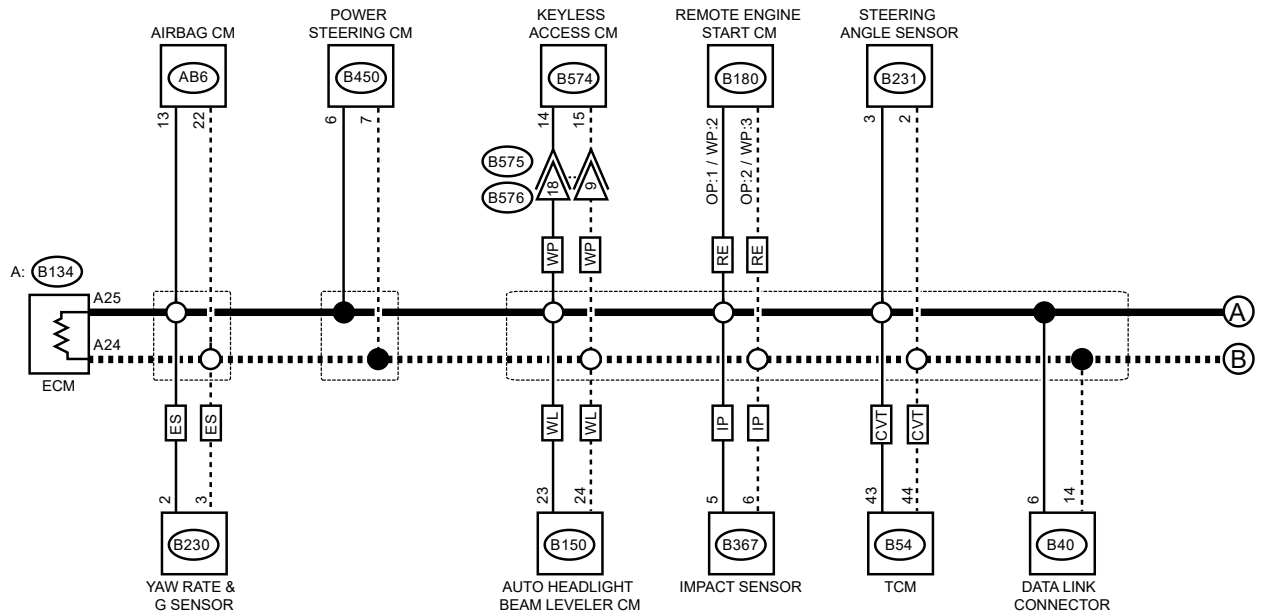
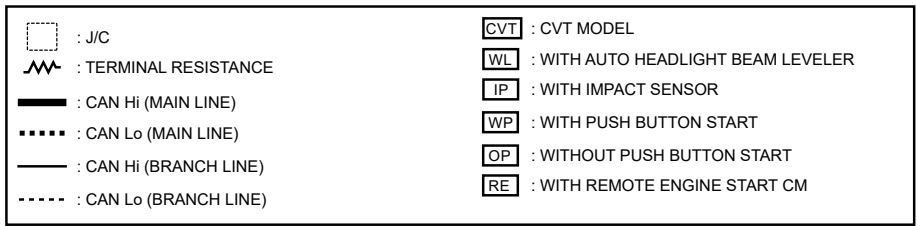
2. BATTERY SHORT INSPECTION

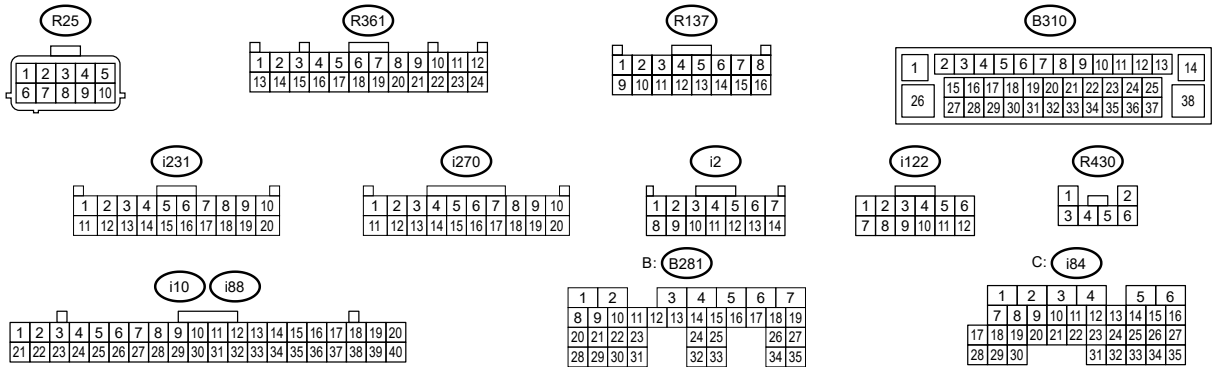
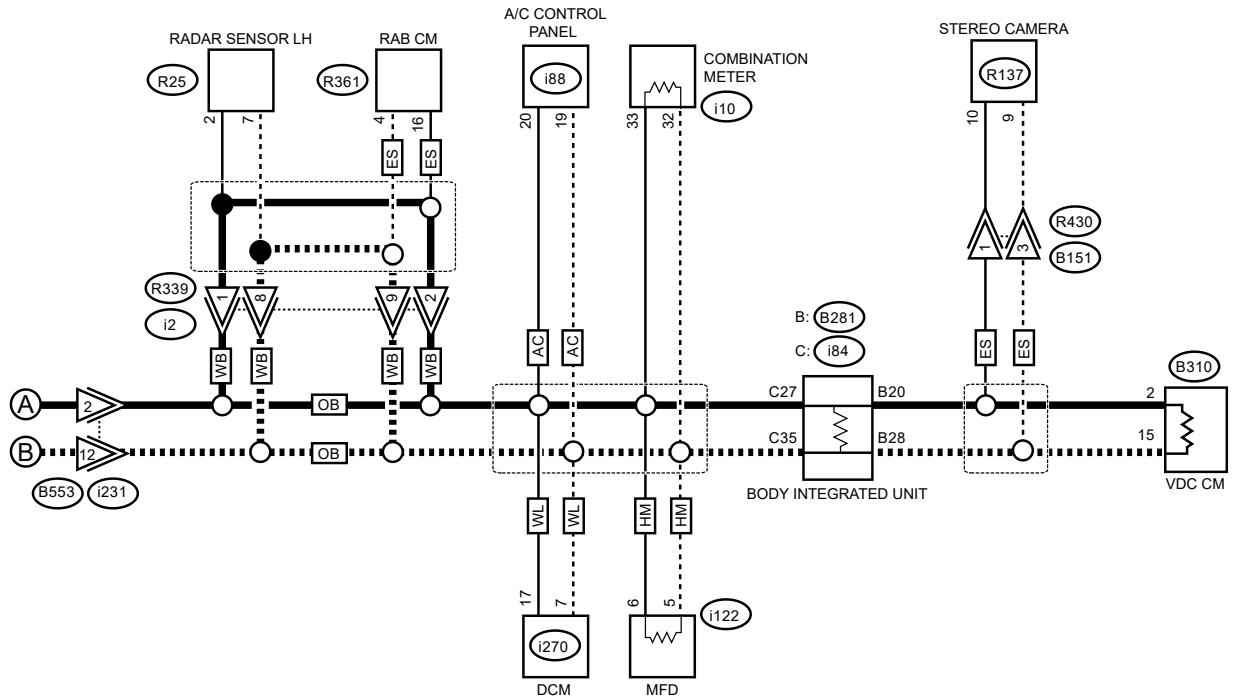
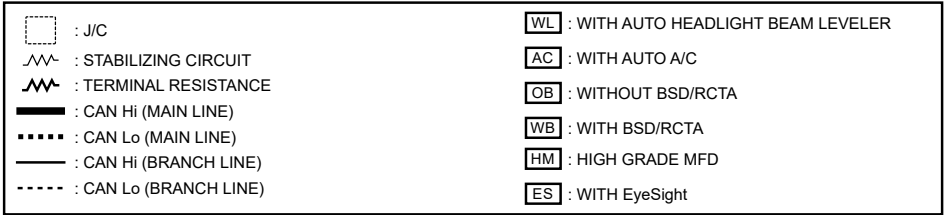
Wiring diagram:

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)

- Non-turbo model



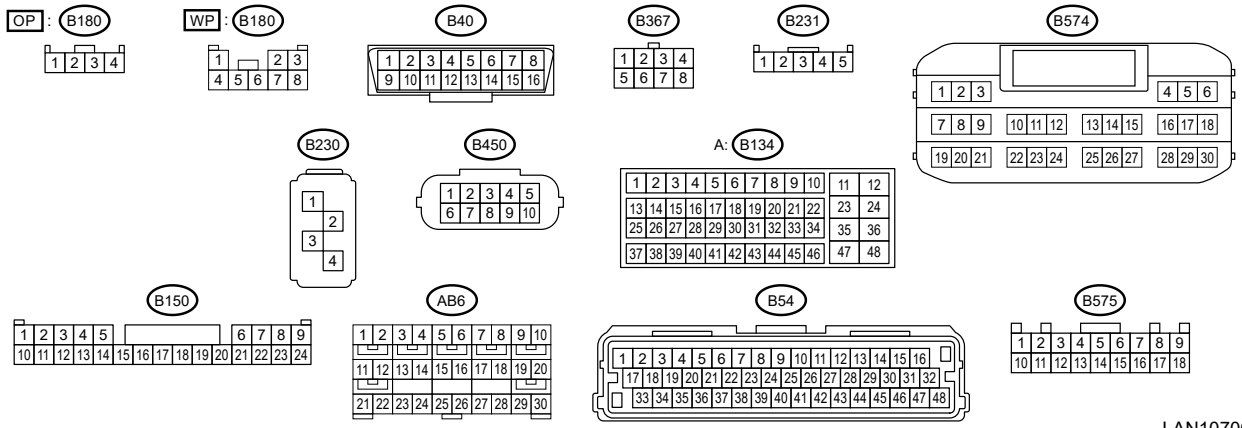
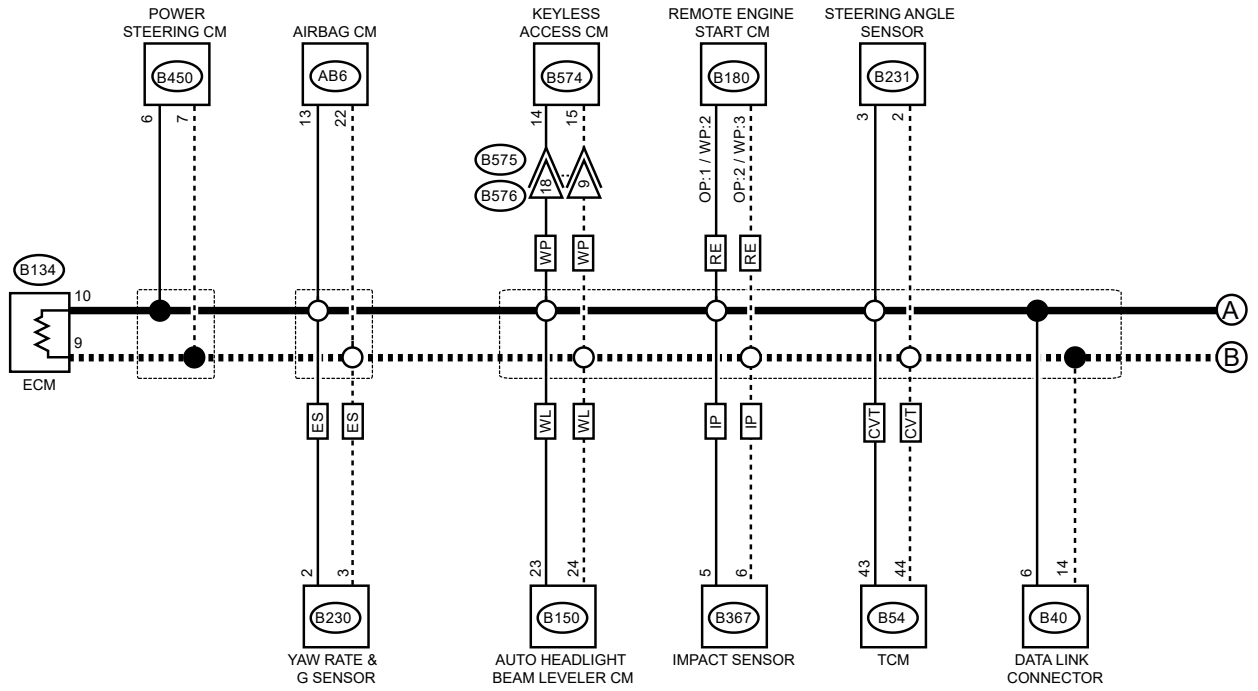
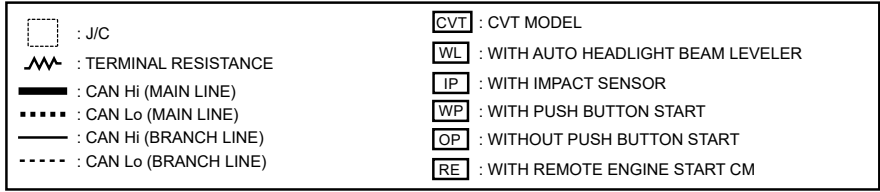




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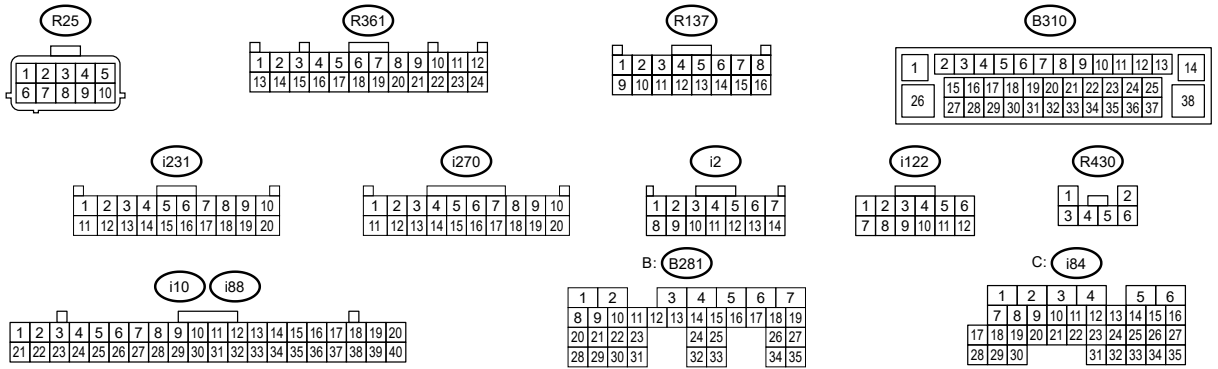
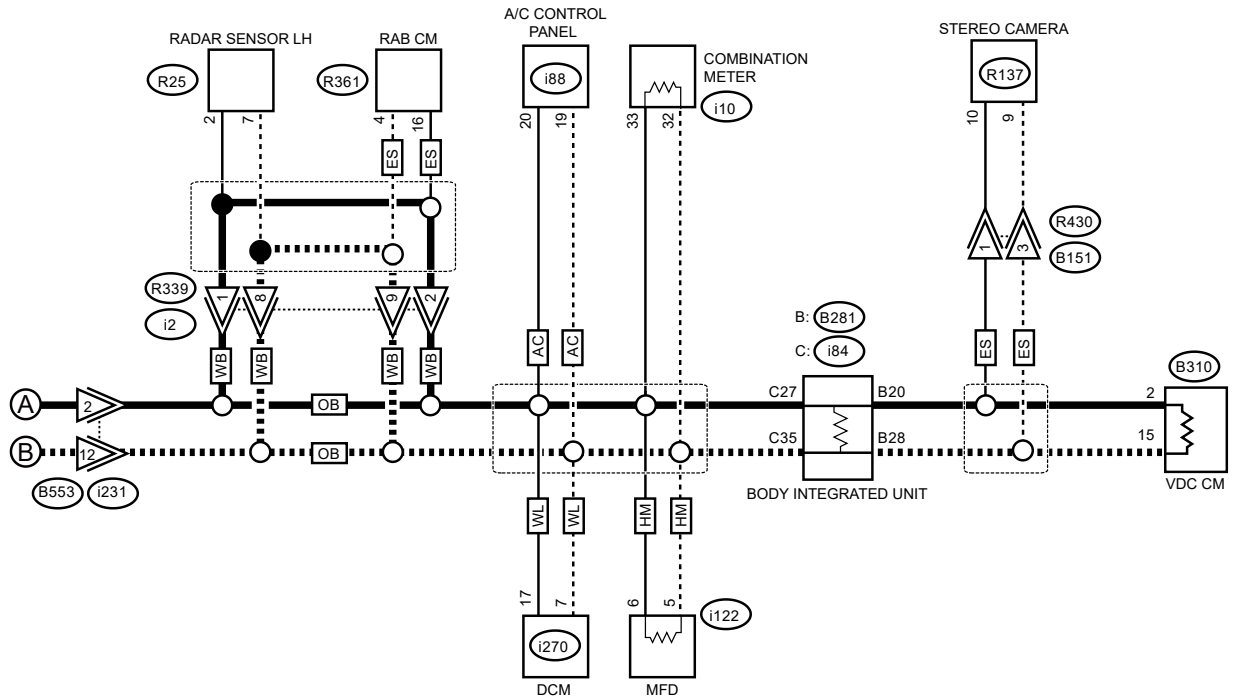
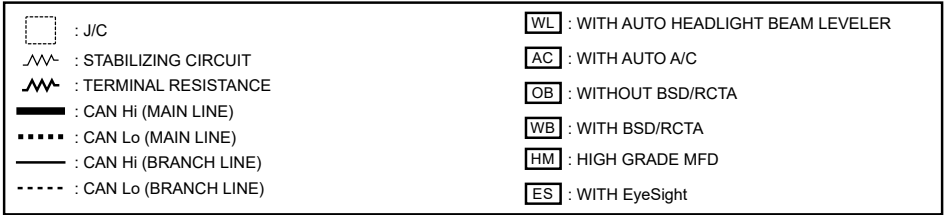
• Turbo model





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Note:

Main wiring harness or related lines may be shorted to battery circuit, or shorted to battery circuit in one of the control modules.

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between terminals.

Connector & terminal

(B40) No. 6 — Chassis ground:




(B40) No. 14 — Chassis ground:

Is the voltage less than 5 V?

Yes

Currently, it is normal.

No

 [Go to 2.](#)

2. CHECK CONTROL MODULE.

With the tester connected, disconnect control module.

Note:

Disconnect the body integrated unit at the end.

Connector & terminal

(B40) No. 6 — Chassis ground:

(B40) No. 14 — Chassis ground:

Did the voltage change less than 5 V?

Yes

Replace the control module whose voltage has changed. When the value changed at disconnecting the body integrated unit,

 [Go to 3.](#)

No

Repair or replace the short circuit of the harness between body integrated unit and ECM.

3. CHECK BETWEEN MAIN WIRING HARNESES.

Using the tester, measure the voltage between terminals.

Connector & terminal

(B281) No. 20 — Chassis ground:

(B281) No. 28 — Chassis ground:

Is the voltage less than 5 V?

Yes


Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL.](#)

No

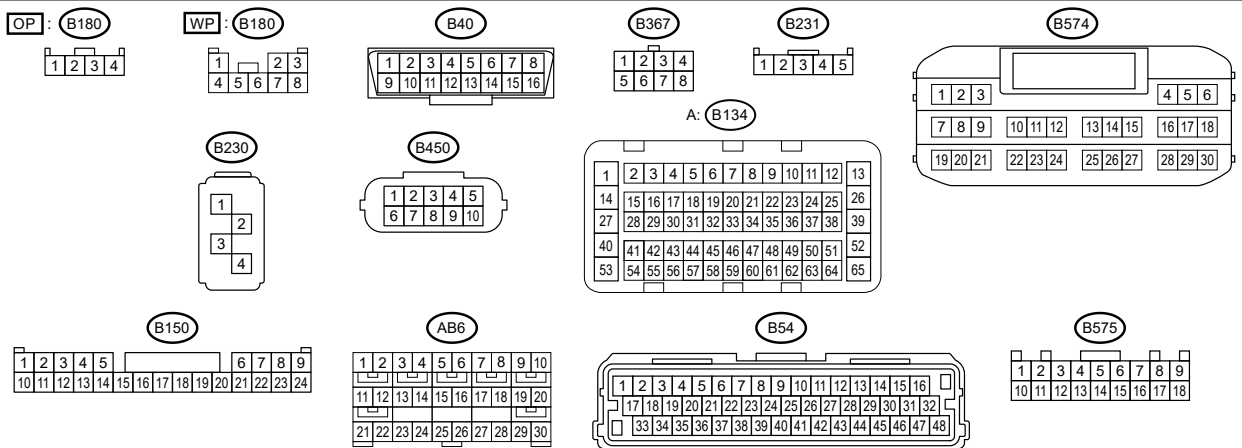
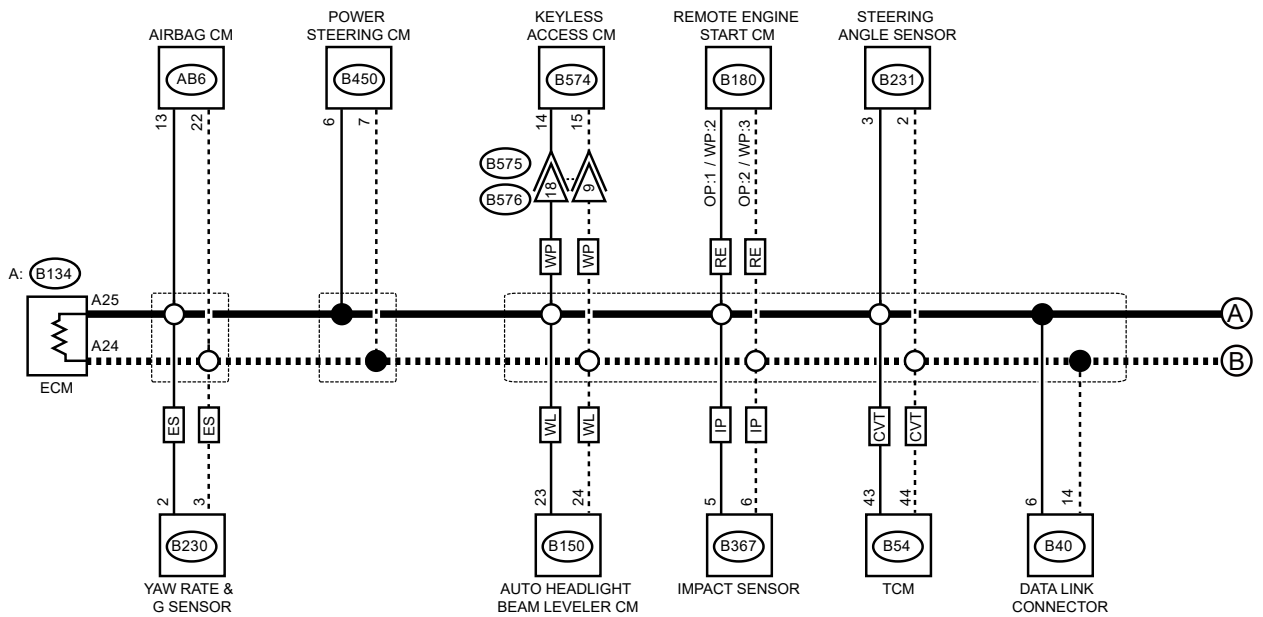
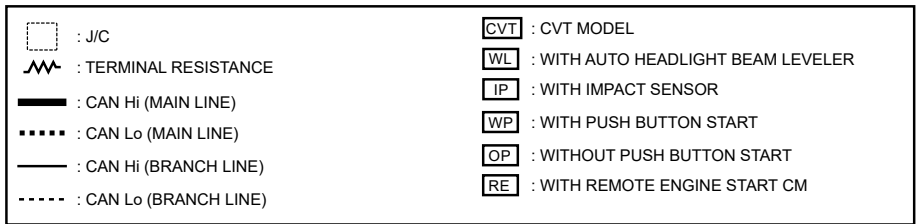
Repair or replace the short circuit of the harness between VDC CM and body integrated unit.

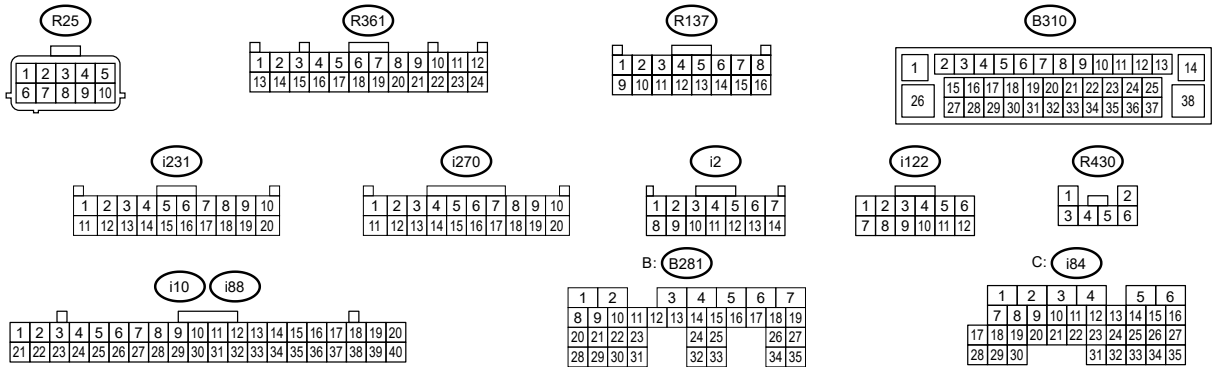
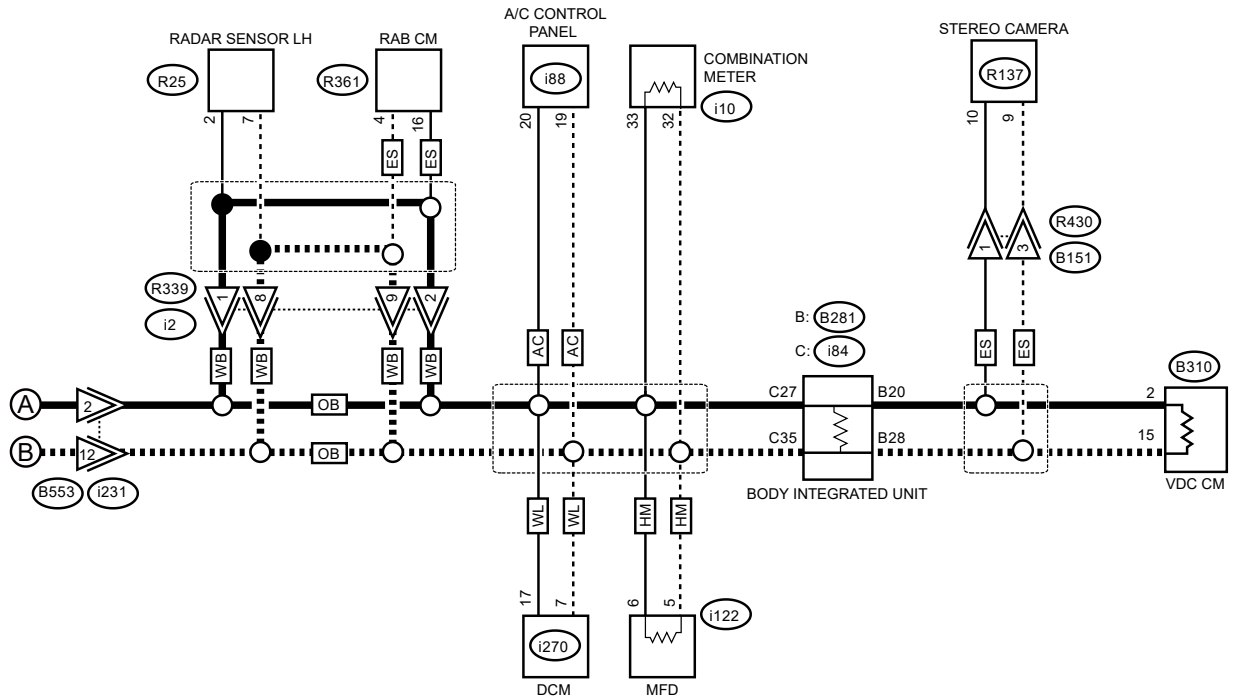
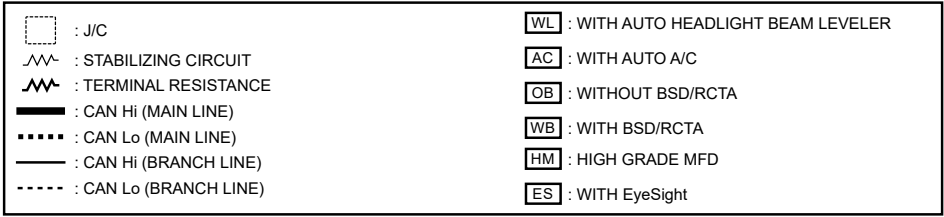
3. 53 — 61 Ω

Wiring diagram:

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)

• Non-turbo model

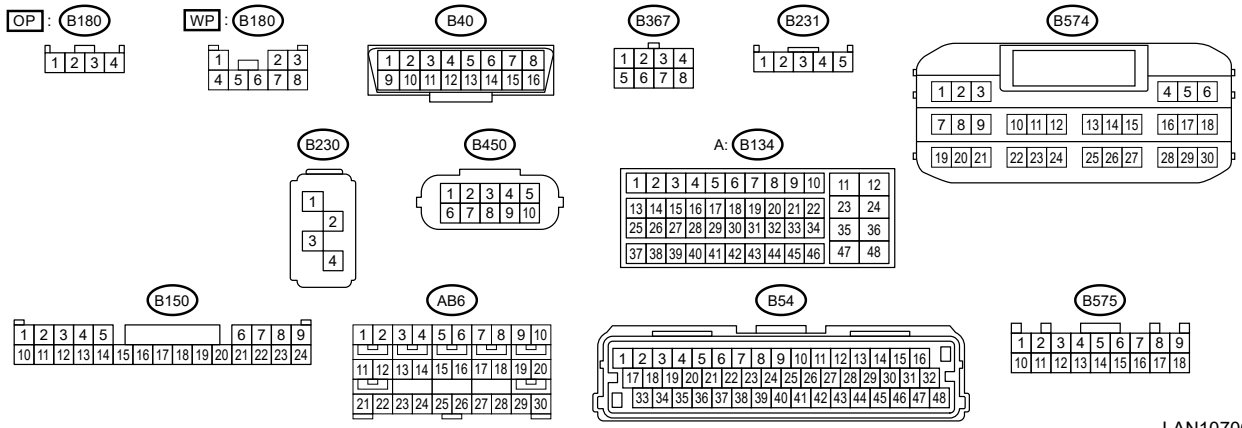
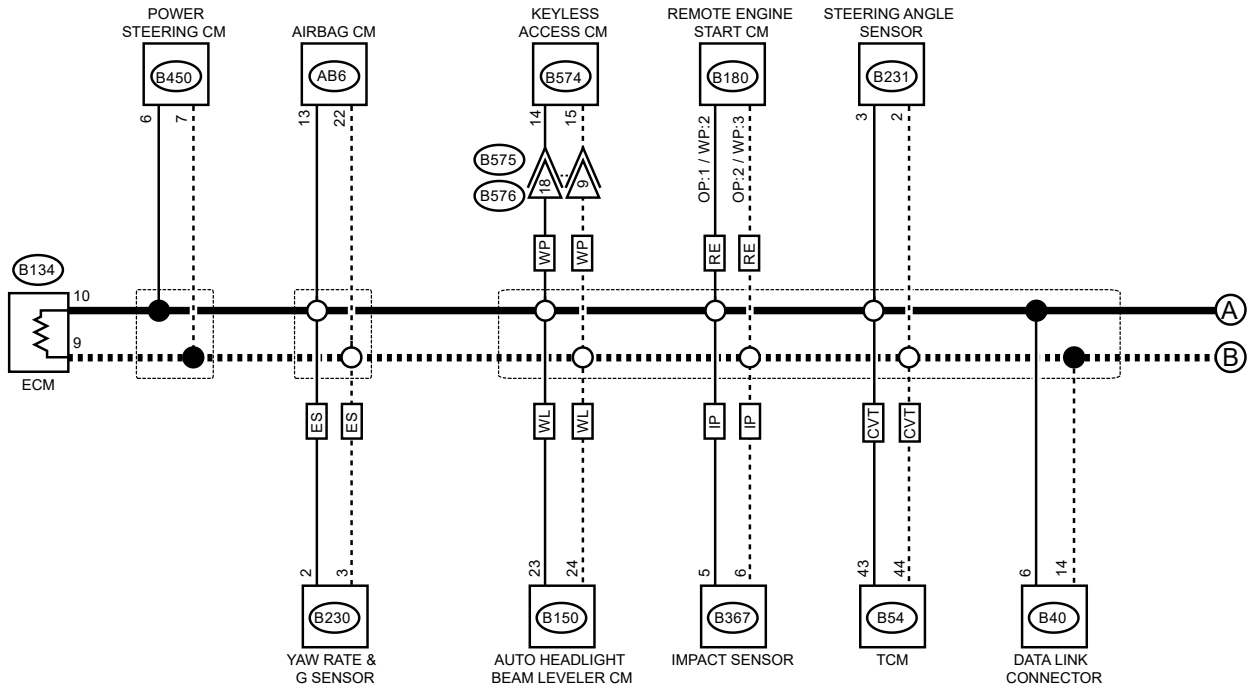
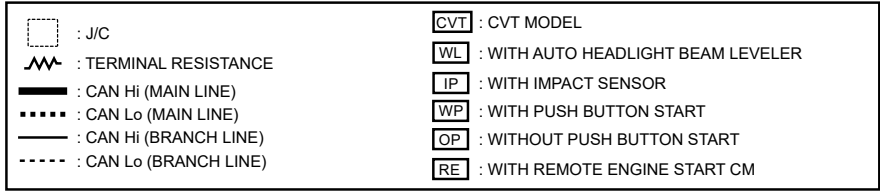




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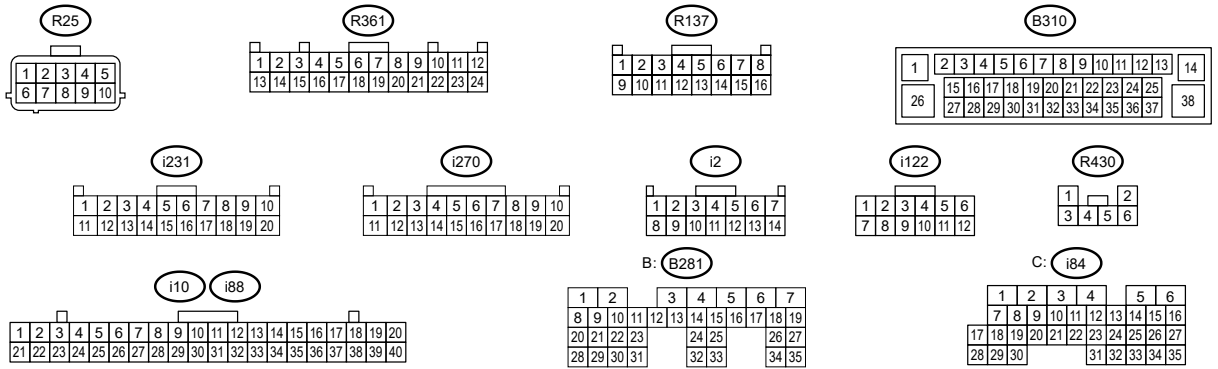
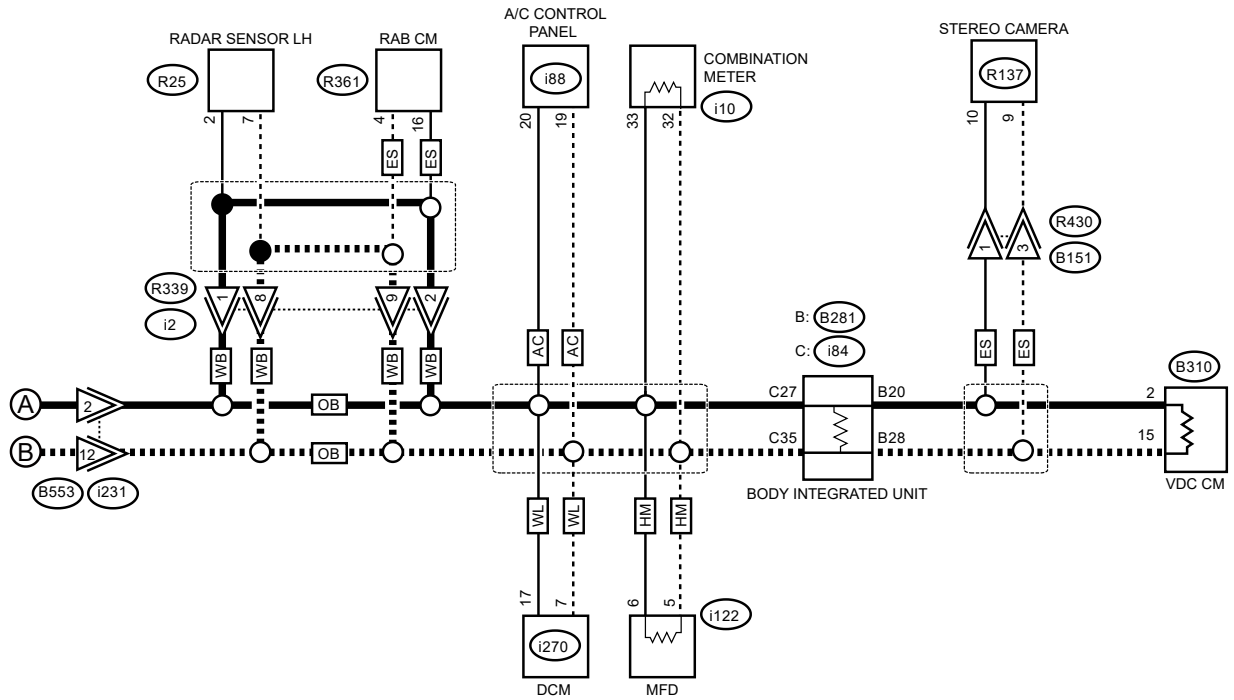
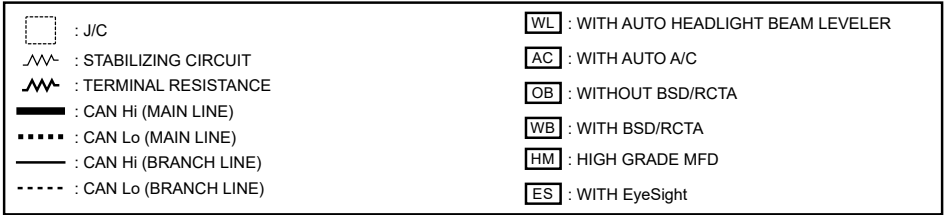
• Turbo model





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Note:

When the measured resistance value is 53 – 61 Ω, main wiring harness or related lines may be shorted to ground, or shorted to power supply line, or related line may be open.

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.



Using the tester, measure the resistance between terminals.


Connector & terminal

(B40) No. 6 – Chassis ground:


(B40) No. 14 – Chassis ground:

Is the resistance less than 10 Ω ?

Yes

 [Go to 2.](#)

No

 [Go to 4.](#)

2. CHECK CONTROL MODULE.

With the tester connected, disconnect control module.

Note:

Disconnect the body integrated unit at the end.

Connector & terminal

(B40) No. 6 — Chassis ground:

(B40) No. 14 — Chassis ground:

Did the resistance change to 10 Ω or more?

Yes

Replace the control module whose resistance has changed. When the value changed at disconnecting the body integrated unit,

 [Go to 3.](#)

No

Repair or replace the short circuit of the harness between body integrated unit and ECM.

3. CHECK MAIN WIRING HARNESS AND RELATED LINES.

Using the tester, measure the resistance between terminals.

Connector & terminal

(B281) No. 20 — Chassis ground:

(B281) No. 28 — Chassis ground:

Is the resistance less than 10 Ω ?

Yes

Repair or replace the short circuit of the harness between VDC CM and body integrated unit.

No

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL.](#)

4. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between terminals.

Connector & terminal

(B40) No. 6 — Chassis ground:
(B40) No. 14 — Chassis ground:

Is the voltage less than 5 V?

Yes

CAN communication circuit is normal.

No

 [Go to 5.](#)

5. CHECK CONTROL MODULE.

With the tester connected, disconnect control module.

Note:

Disconnect the body integrated unit at the end.

Connector & terminal

(B40) No. 6 — Chassis ground:

(B40) No. 14 — Chassis ground:

Did the voltage change less than 5 V?

Yes

Replace the control module whose voltage has changed. When the value changed at disconnecting the body integrated unit,

 [Go to 6.](#)

No

Repair or replace the short circuit of the harness between body integrated unit and ECM.

6. CHECK HARNESS.

Using a tester, measure the voltage between terminals and chassis ground.

Connector & terminal

(B281) No. 20 — Chassis ground:

(B281) No. 28 — Chassis ground:

Is the voltage less than 5 V?

Yes


Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL.](#)

No

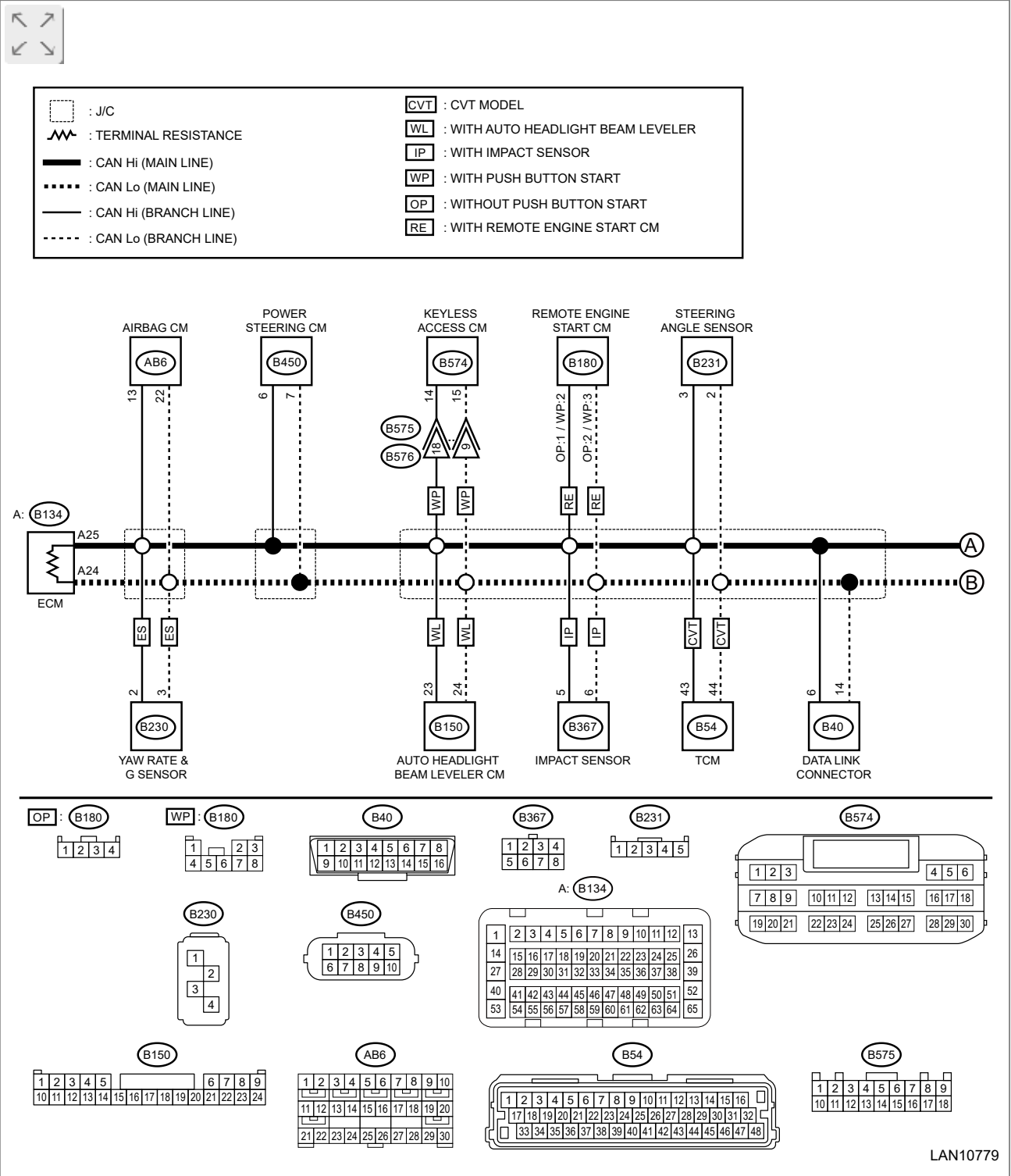
Repair or replace the short circuit of the harness between VDC CM and body integrated unit.

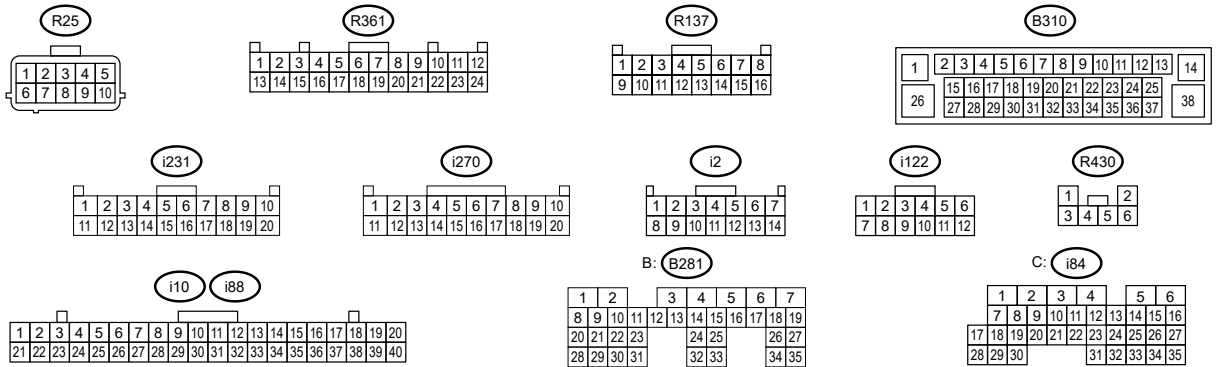
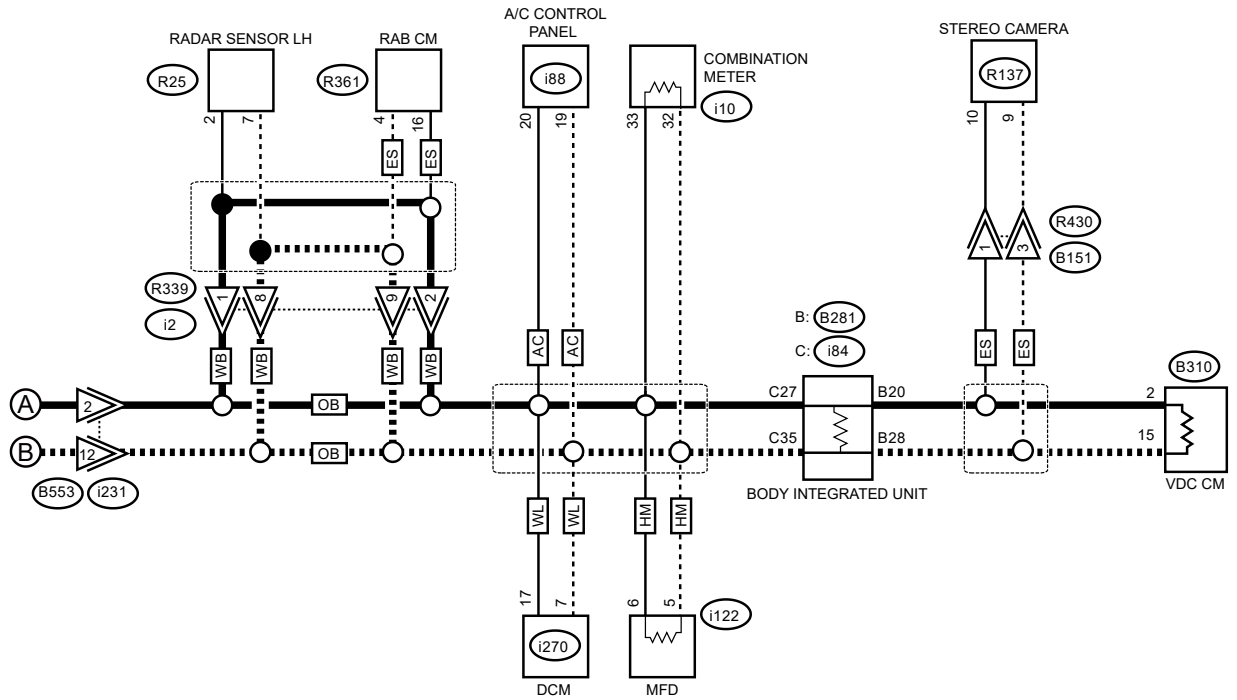
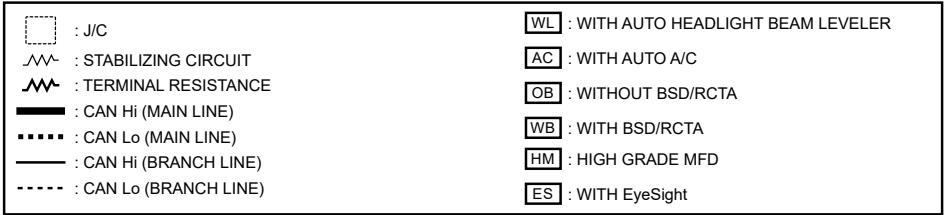
4. 52 Ω OR LESS

Wiring diagram:

CAN communication system  Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.

- Non-turbo model

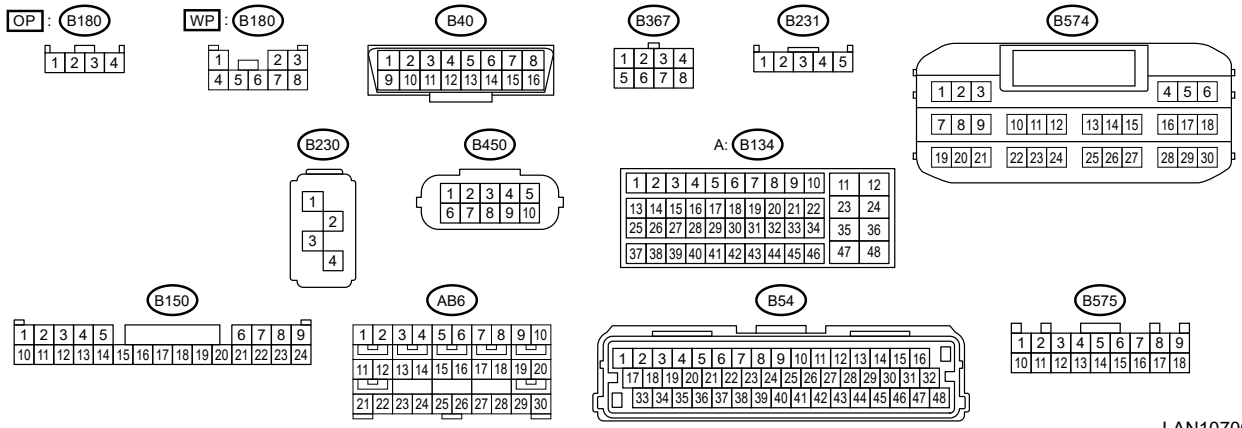
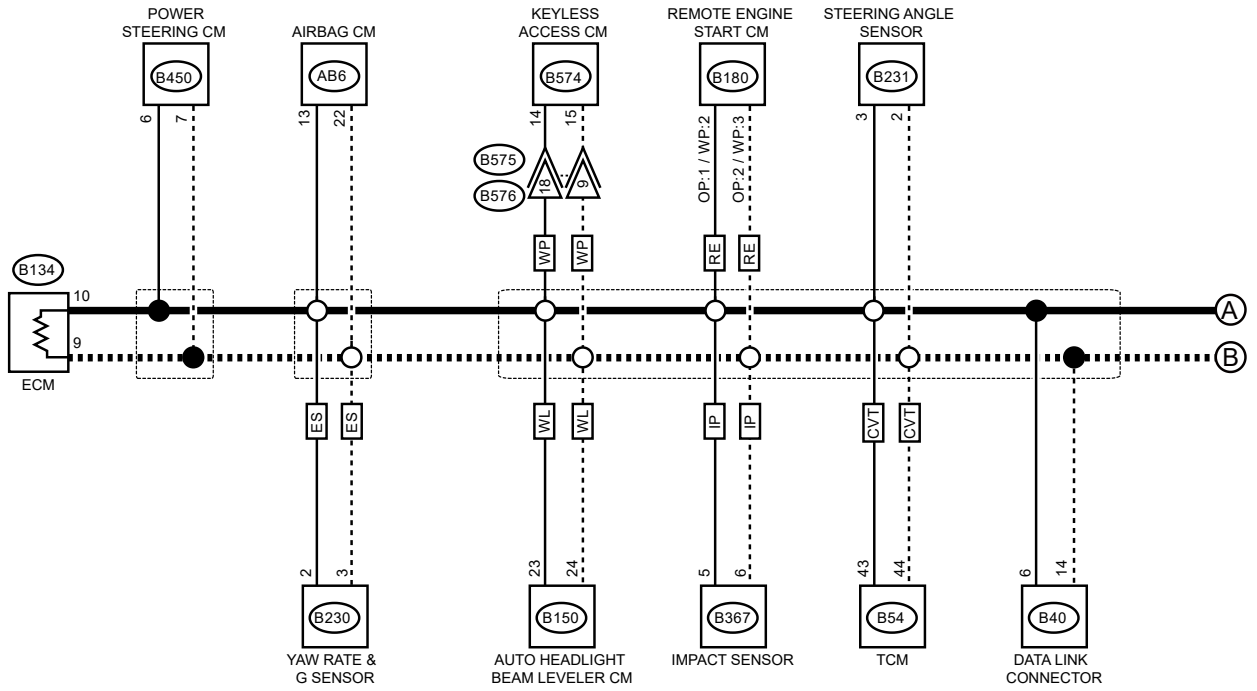
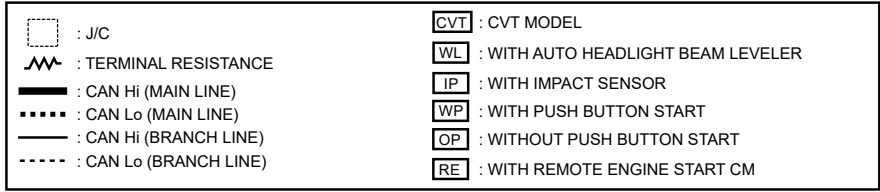




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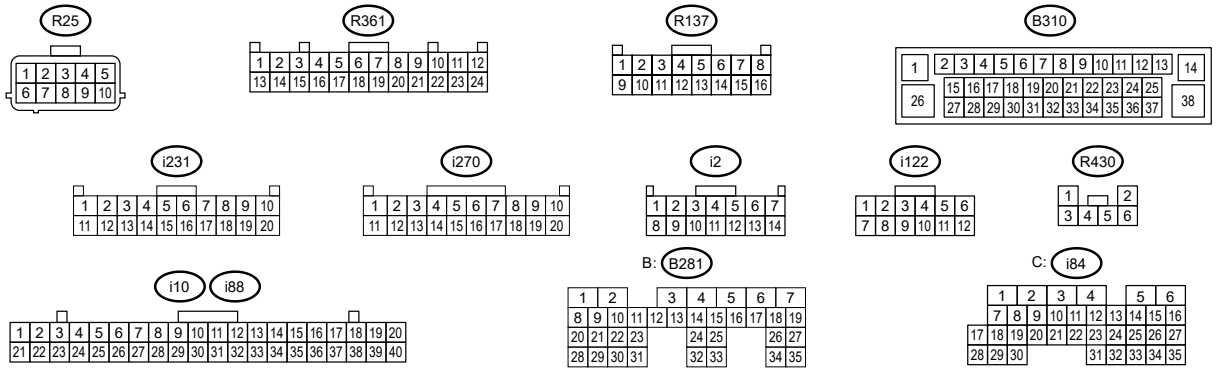
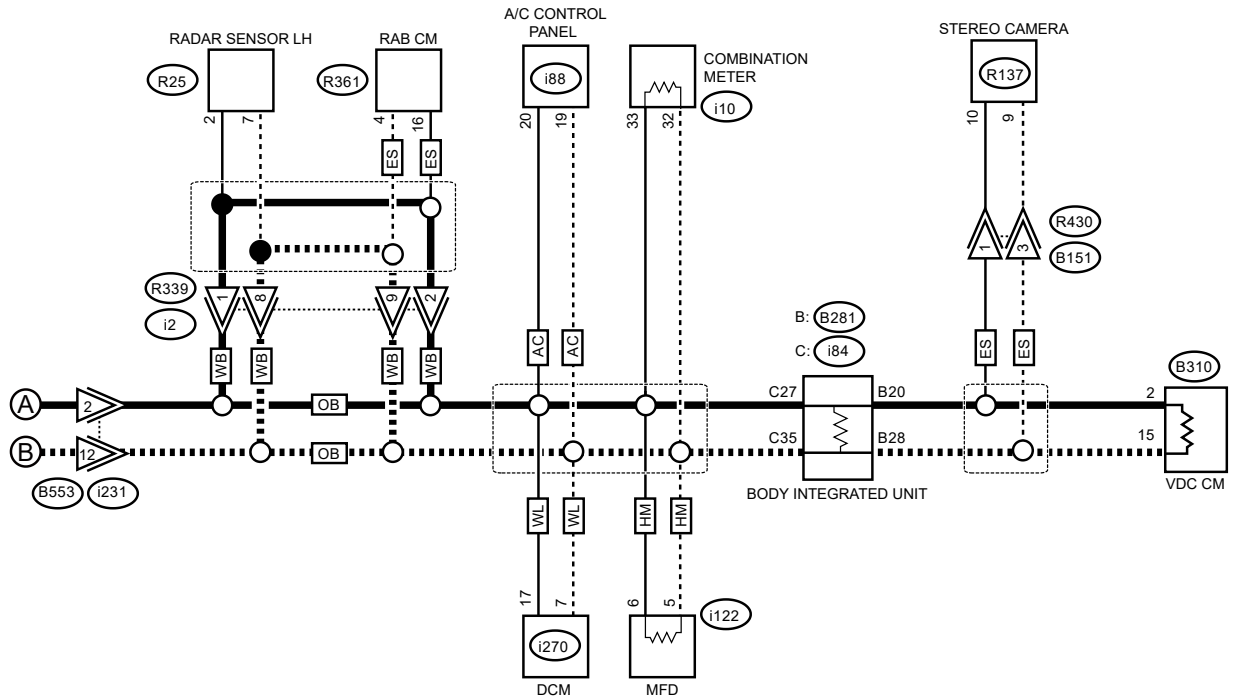
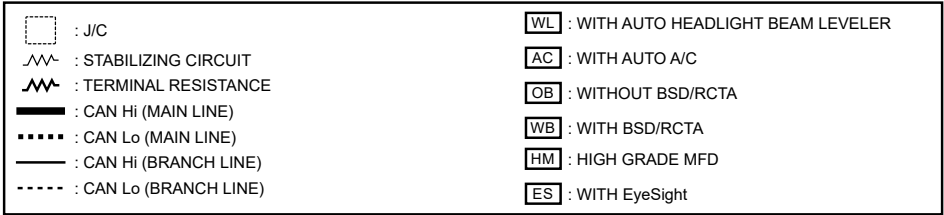
• Turbo model





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Note:

When the bus line is measured, combined resistance of end resistance (120 Ω) in ECM and end resistance (120 Ω) in VDC CM can be measured. The combined resistance is approximately 53 – 61 Ω with the stabilizing circuit included. When the measured resistance value is 52 Ω or less, main wiring harness or related lines may be shorted, or combined resistance may have changed because resistance other than end resistance is created on the circuit.

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

Using the tester, measure the resistance between terminals.

Connector & terminal

(B40) No. 6 — No. 14:

Is the resistance less than 10 Ω?

Yes

 [Go to 2.](#)

No

 [Go to 4.](#)

2. CHECK MAIN WIRING HARNESS AND RELATED LINES.

With a tester connected, disconnect control module connectors in order.

Note:

Disconnect the body integrated unit at the end.


Connector & terminal

(B40) No. 6 — No. 14:

Is there any control module whose condition has changed from short state?

Yes

Replace the control module whose resistance has changed. When the value changed at disconnecting the body integrated unit,

 [Go to 3.](#)

No

Repair or replace the short circuit of the harness between body integrated unit and ECM.

3. CHECK BETWEEN MAIN WIRING HARNESSES.

Using the tester, measure the resistance between terminals.

Connector & terminal

(B281) No. 20 — No. 28:

Is the resistance less than 10 Ω?

Yes

Repair or replace the short circuit of the harness between VDC CM and body integrated unit.

No

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL.](#)

4. CHECK CONTROL MODULE.

1. Disconnect ECM and VDC CM connectors.

2. Using a tester, measure the resistance between control module terminals.

Connector & terminal

(B137) No. 19 — No. 18 (non-turbo model):

(B134) No. 9 — No. 10 (turbo model):

(B310) No. 2 — No. 15:

Is the resistance 114 — 126 Ω ?

Yes

 [Go to 5.](#)

No

Replace the control module whose end resistance value is out of the specified range.

5. CHECK CONTROL MODULE.

1. Disconnect the connector of body integrated unit.

2. Using a tester, measure the resistance between control module terminals.

Connector & terminal

(B281) No. 28 — (i84) No. 27:

(B281) No. 20 — (i84) No. 35:

Is the resistance 2850 — 3150 Ω ?

Yes

 [Go to 6.](#)

No

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL.](#)

6. CHECK CONTROL MODULE.

Using a tester, measure the resistance between control module terminals.

Connector & terminal

(B281) No. 28 — (i84) No. 35:

(B281) No. 20 — (i84) No. 27:

Is the resistance less than 1 Ω ?

Yes

 [Go to 7.](#)

No

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL.](#)

7. CHECK CONTROL MODULE.


1. Disconnect the combination meter connector.
2. Using a tester, measure the resistance between control module terminals.

Connector & terminal


(i10) No. 32 — No. 33:

Is the resistance 2850 — 3150 Ω ?

Yes

 [Go to 8.](#)

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter>REMOVAL.](#)

8. CHECK CONTROL MODULE (ONLY FOR MODELS WITH HIGH GRADE MFD).


1. Disconnect the MFD connector.
2. Using a tester, measure the resistance between control module terminals.

Connector & terminal


(i122) No. 5 — No. 6:

Is the resistance 2850 — 3150 Ω ?

Yes

 [Go to 9.](#)

No

Replace the MFD.  [Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display_\(MFD\)>REMOVAL.](#)

9. CHECK HARNESS.

Using the tester, check the short circuit of each harness.

Connector & terminal


(B281) No. 28 — No. 20:

Is the resistance 1 M Ω or more?

Yes

 [Go to 11.](#)

No

 [Go to 10.](#)

10. CHECK CONTROL MODULE.

With a tester connected, disconnect control modules in order.

Connector & terminal

(B281) No. 28 — No. 20:

Are there any control modules whose resistance changed to 1 MΩ or more?

Yes

Replace the control module that has changed.

No

Repair or replace the harness part which has resistance component.

11. CHECK CONTROL MODULE.



With a tester connected, disconnect control modules in order.

Connector & terminal

(i84) No. 27 — No. 35:

Are there any control modules whose resistance changed to 1 MΩ or more?

Yes


Replace the control module that has changed.

No

Repair or replace the harness part which has resistance component.

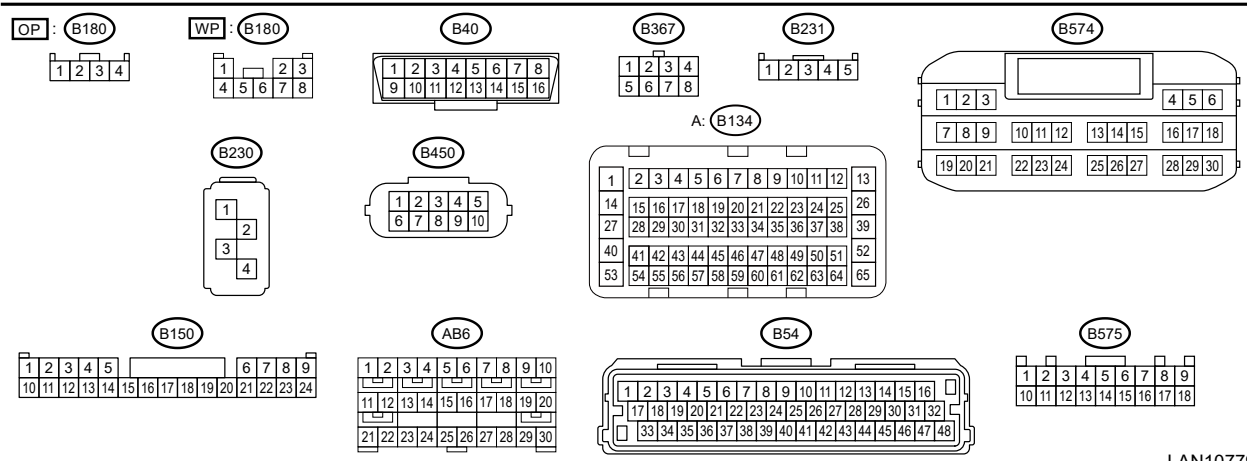
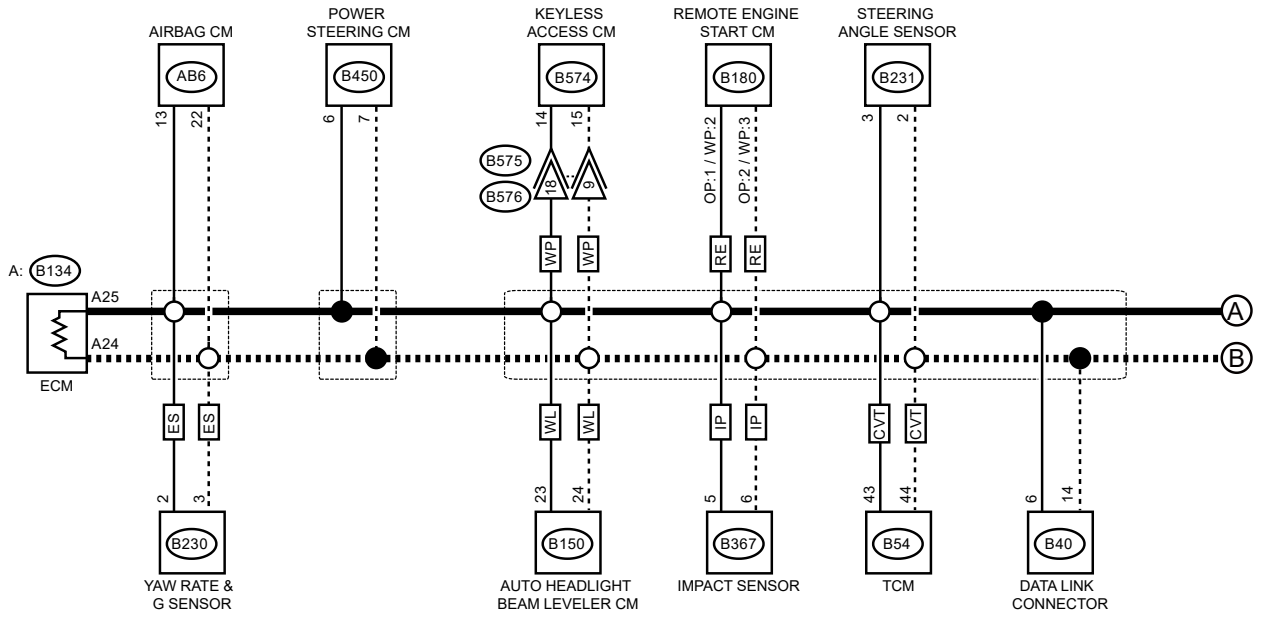
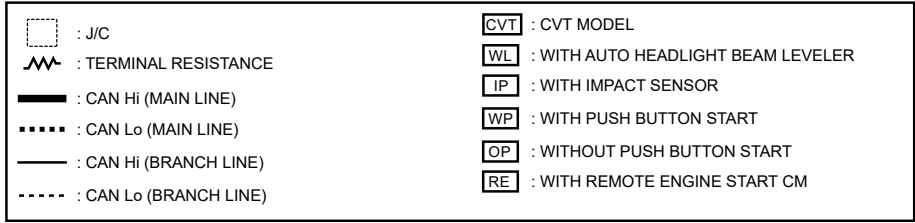
5. 62 Ω OR MORE

Wiring diagram:

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)

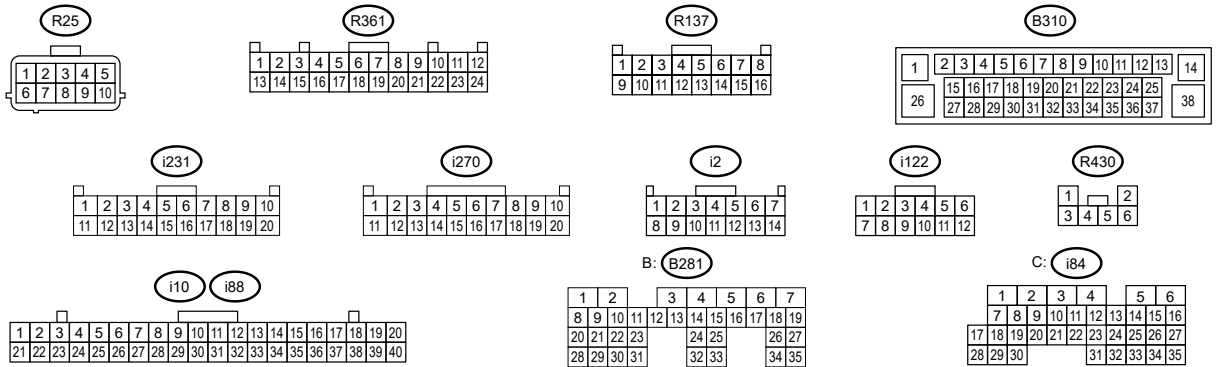
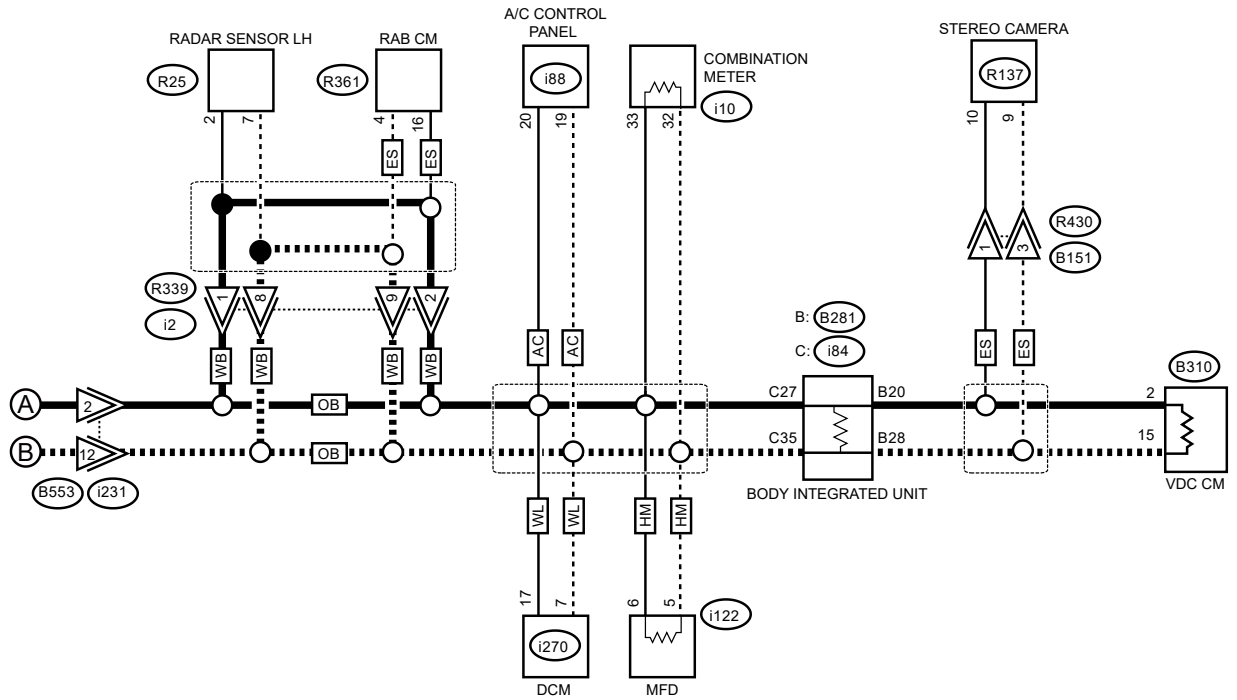
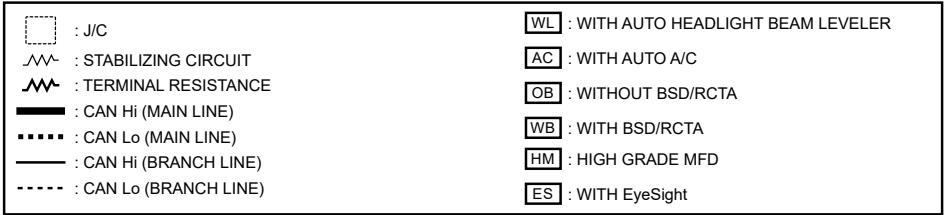
- Non-turbo model





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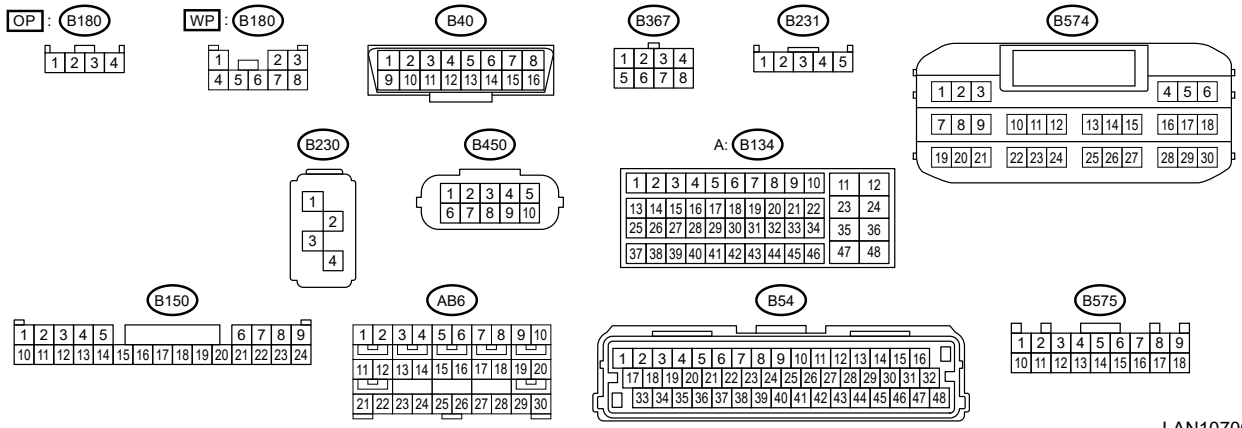
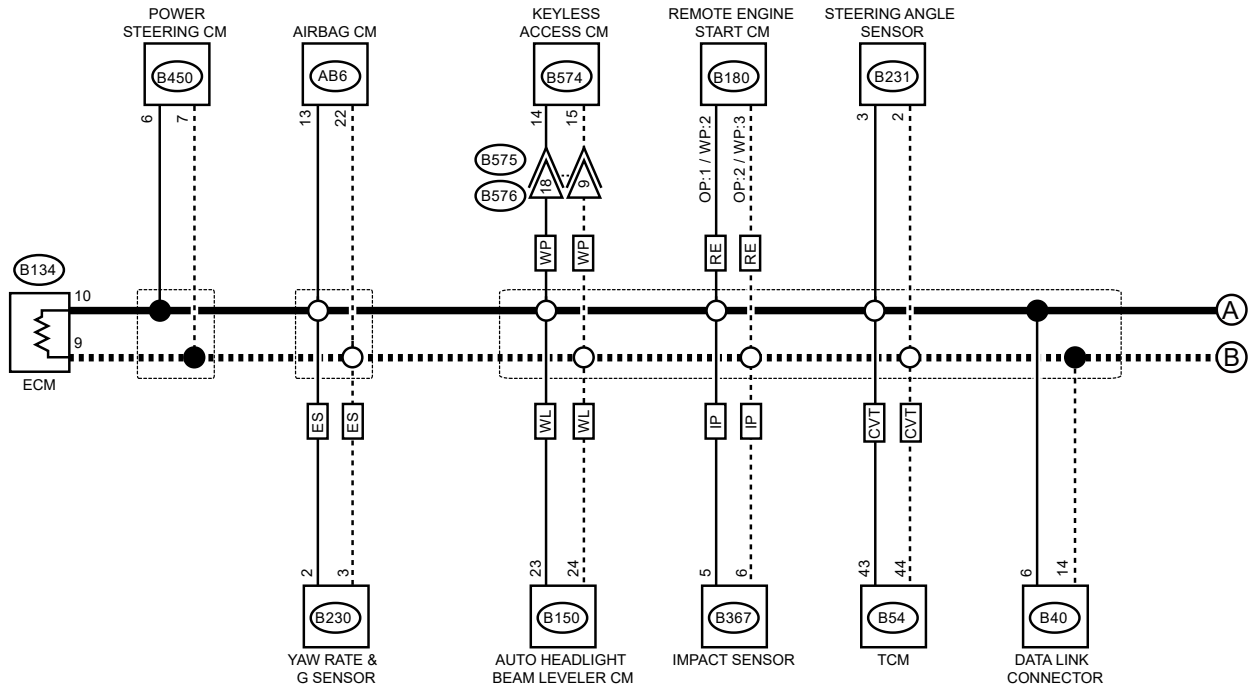
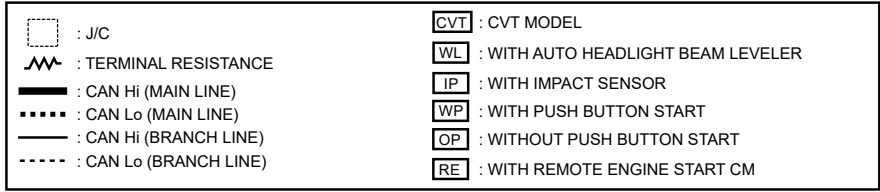




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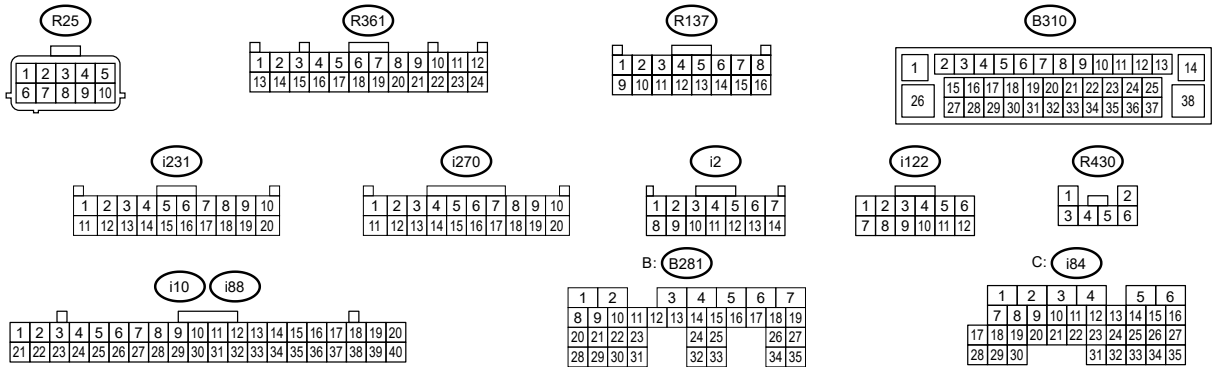
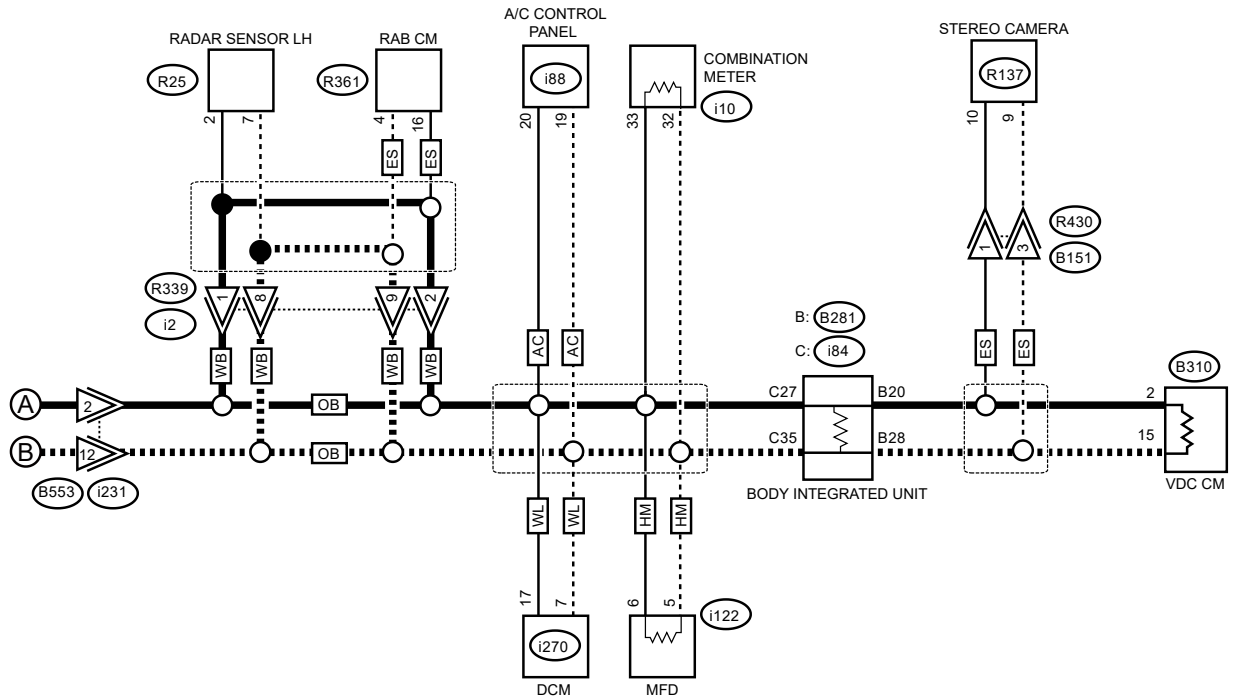
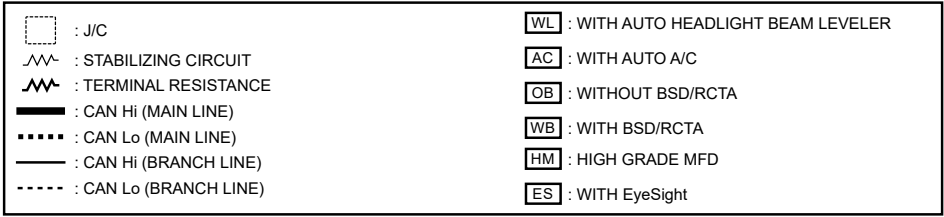
• Turbo model





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Note:

When CAN communication circuit is measured, combined resistance of end resistance (120 Ω) in ECM and end resistance (120 Ω) in VDC CM can be measured. The combined resistance is approximately 53 – 61 Ω with the stabilizing circuit included. When the measured resistance value is 62 Ω or more, either one of the end resistances, or stabilizing circuit, or main wiring harness may have malfunction such as open circuit.

1. CHECK CONTROL MODULE.

1. Disconnect ECM and VDC CM connectors.



2. Using a tester, measure the resistance between control module terminals.

Connector & terminal

(B137) No. 19 — No. 18 (non-turbo model):

(B134) No. 9 — No. 10 (turbo model):

(B310) No. 2 — No. 15:

Is the resistance 114 — 126 Ω ?

Yes

 [Go to 2.](#)

No

Replace the control module whose value is out of the specification.

2. CHECK CONTROL MODULE.

1. Disconnect the connector of body control module.

2. Using a tester, measure the resistance between control module terminals.

Connector & terminal

(B281) No. 28 — (i84) No. 27:


(B281) No. 20 — (i84) No. 35:

Is the resistance 2850 — 3150 Ω ?

Yes

 [Go to 3.](#)

No

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL.](#)

3. CHECK CONTROL MODULE.

Using the tester, measure the resistance between terminals.

Connector & terminal

(B281) No. 28 — (i84) No. 35:


(B281) No. 20 — (i84) No. 27:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL.](#)

4. CHECK CONTROL MODULE.


1. Disconnect the combination meter connector.
2. Using a tester, measure the resistance between control module terminals.

Connector & terminal


(i10) No. 32 — No. 33:

Is the resistance 2850 — 3150 Ω ?

Yes

 [Go to 5.](#)

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter>REMOVAL.](#)

5. CHECK CONTROL MODULE (ONLY FOR MODELS WITH HIGH GRADE MFD).




1. Disconnect the MFD connector.
2. Using a tester, measure the resistance between control module terminals.

Connector & terminal


(i122) No. 5 — No. 6:

Is the resistance 2850 — 3150 Ω ?

Yes

 [Go to 6.](#)

No

Replace the MFD.  [Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display_\(MFD\)>REMOVAL.](#)

6. CHECK HARNESS.



Using a tester, check continuity between terminals.

Connector & terminal

- (B40) No. 6 — (B137) No. 19 (non-turbo model):
- (B40) No. 14 — (B137) No. 18 (non-turbo model):
- (B40) No. 6 — (B134) No. 10 (turbo model):
- (B40) No. 14 — (B134) No. 9 (turbo model):
- (B40) No. 6 — (i84) No. 27:
- (B40) No. 14 — (i84) No. 35:

Is there continuity?

Yes

 [Go to 7.](#)

No

Repair or replace the open circuit of harness.

7. CHECK HARNESS.



Using a tester, check continuity between terminals.

Connector & terminal

(B281) No. 20 — (B310) No. 2:

(B281) No. 28 — (B310) No. 15:

Is there continuity?

Yes

It is possible that temporary poor communication occurs.

No

Repair or replace the open circuit of harness.

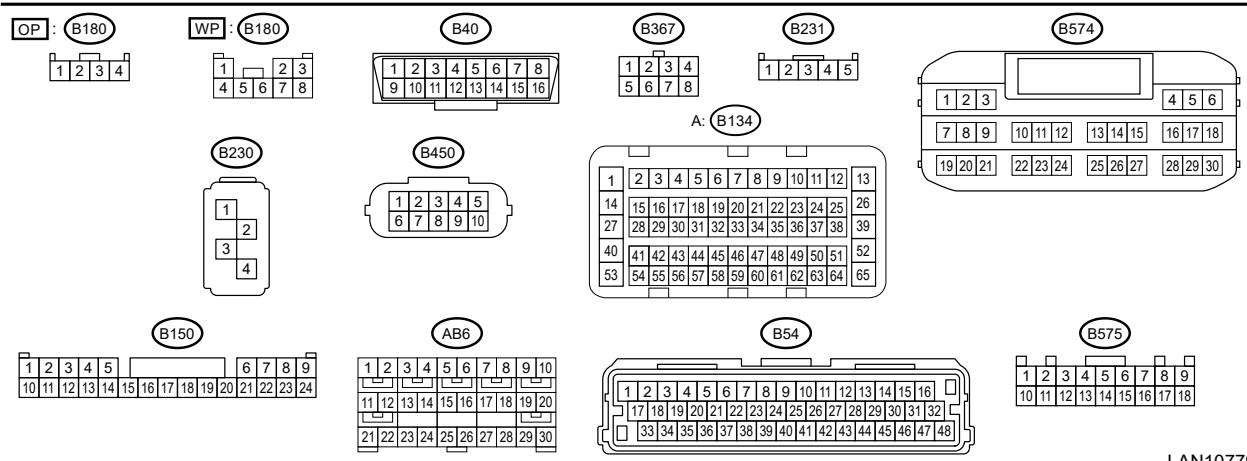
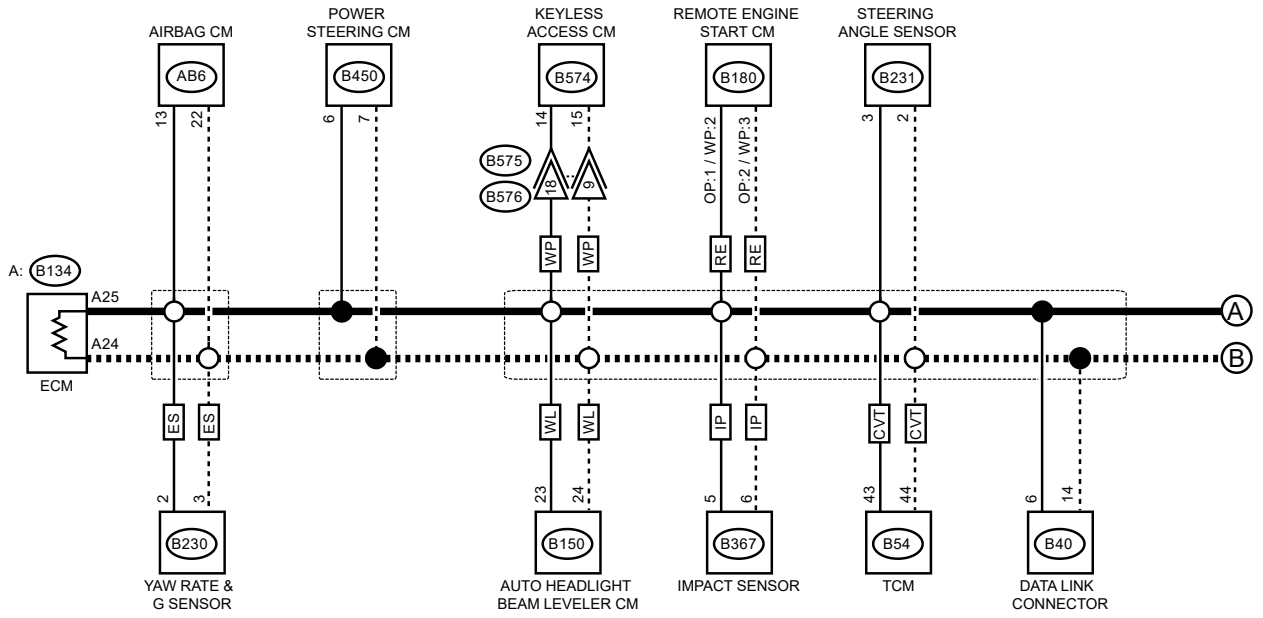
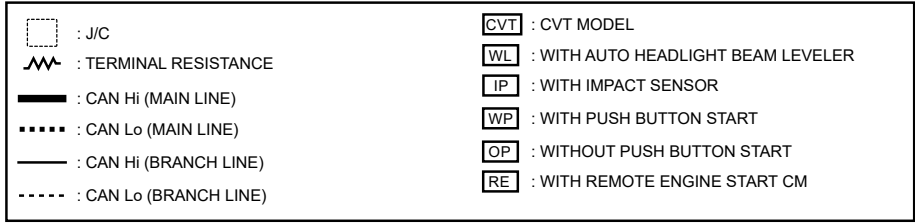
6. RELATED LINES 53 — 61 Ω (TCM)

Wiring diagram:

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)

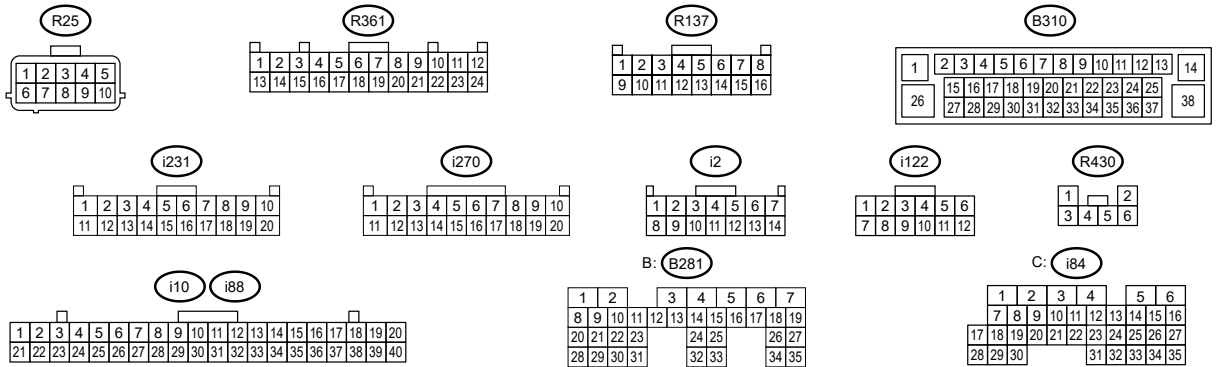
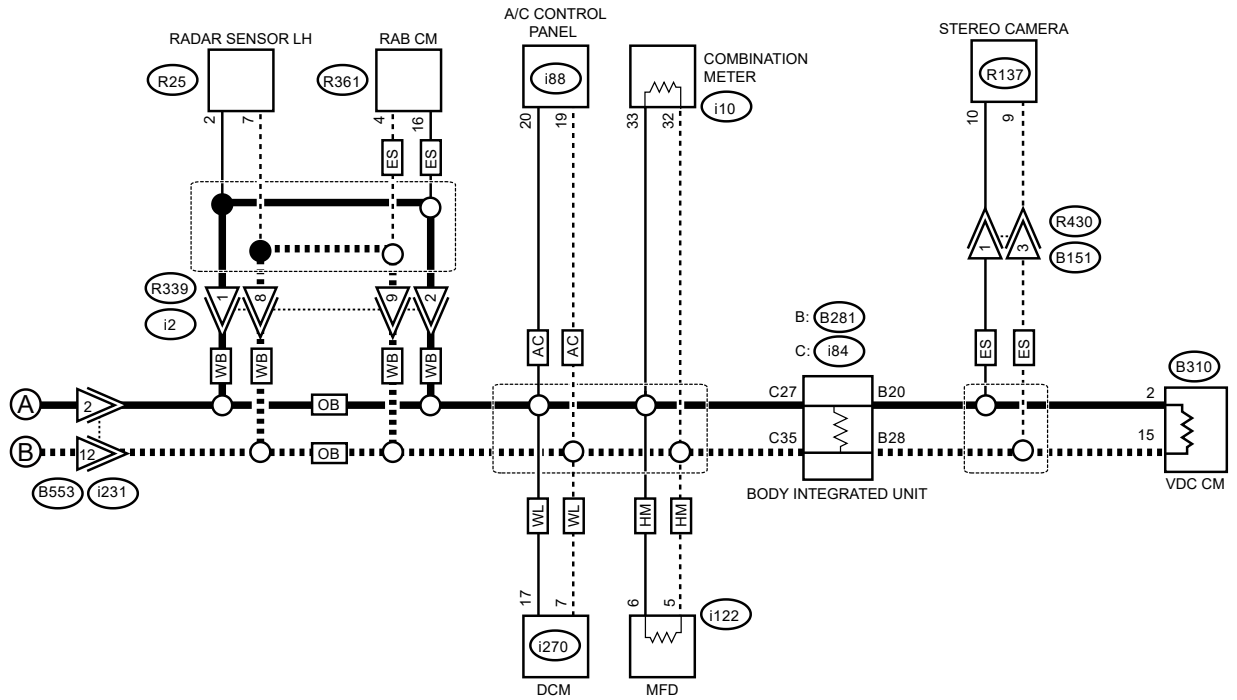
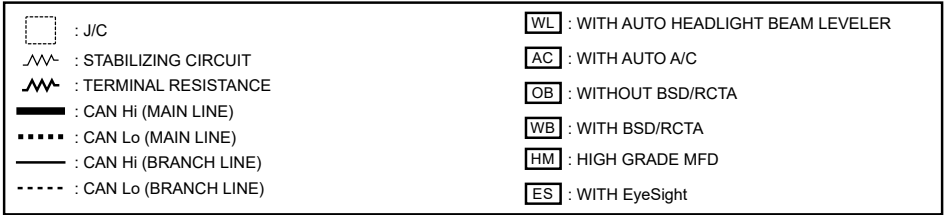
- Non-turbo model





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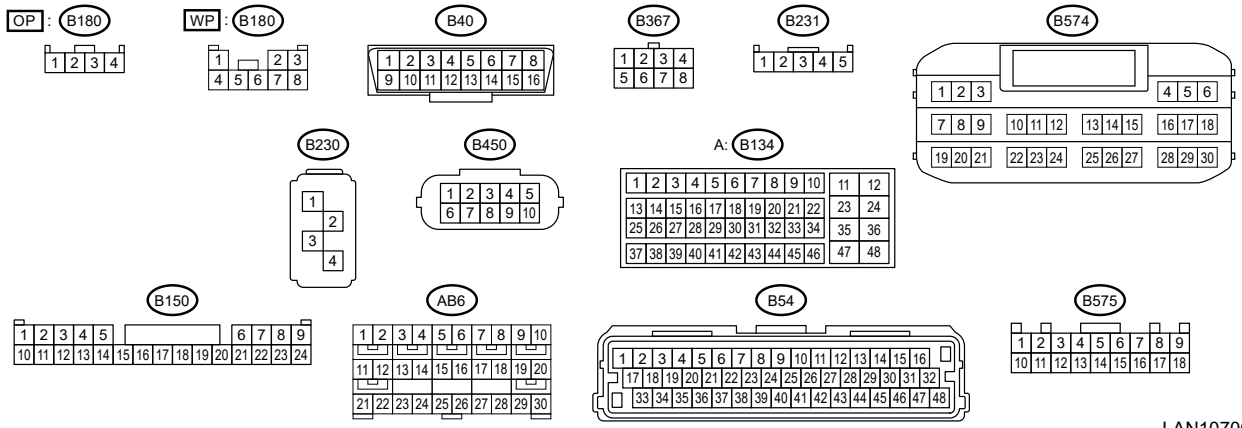
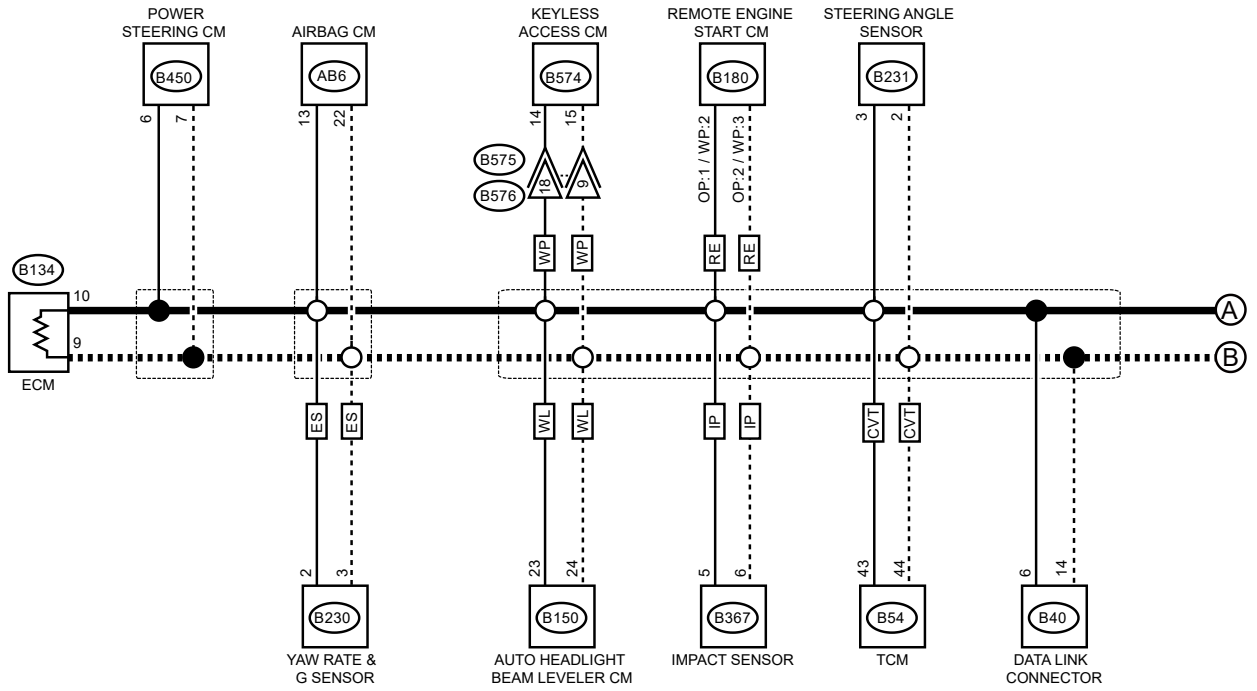
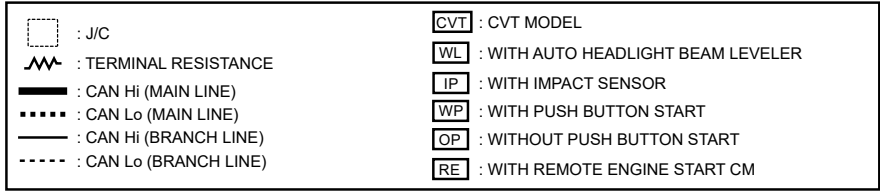




LAN10705

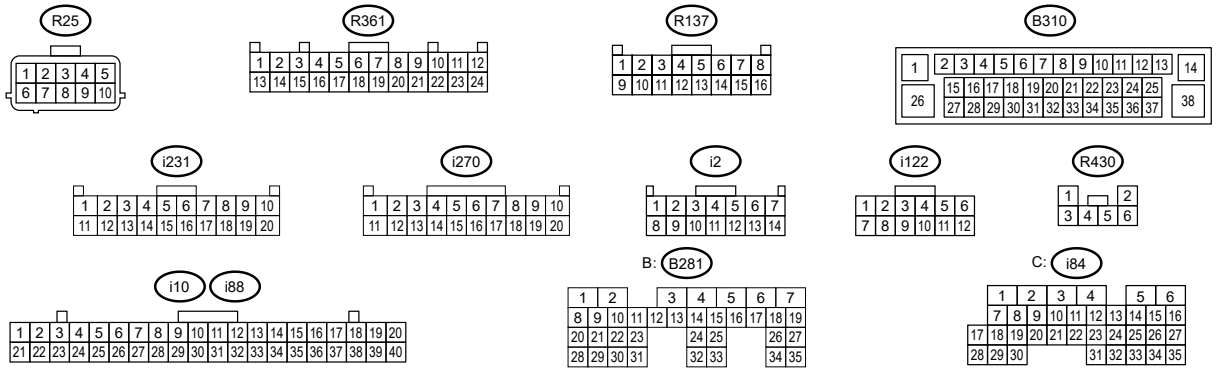
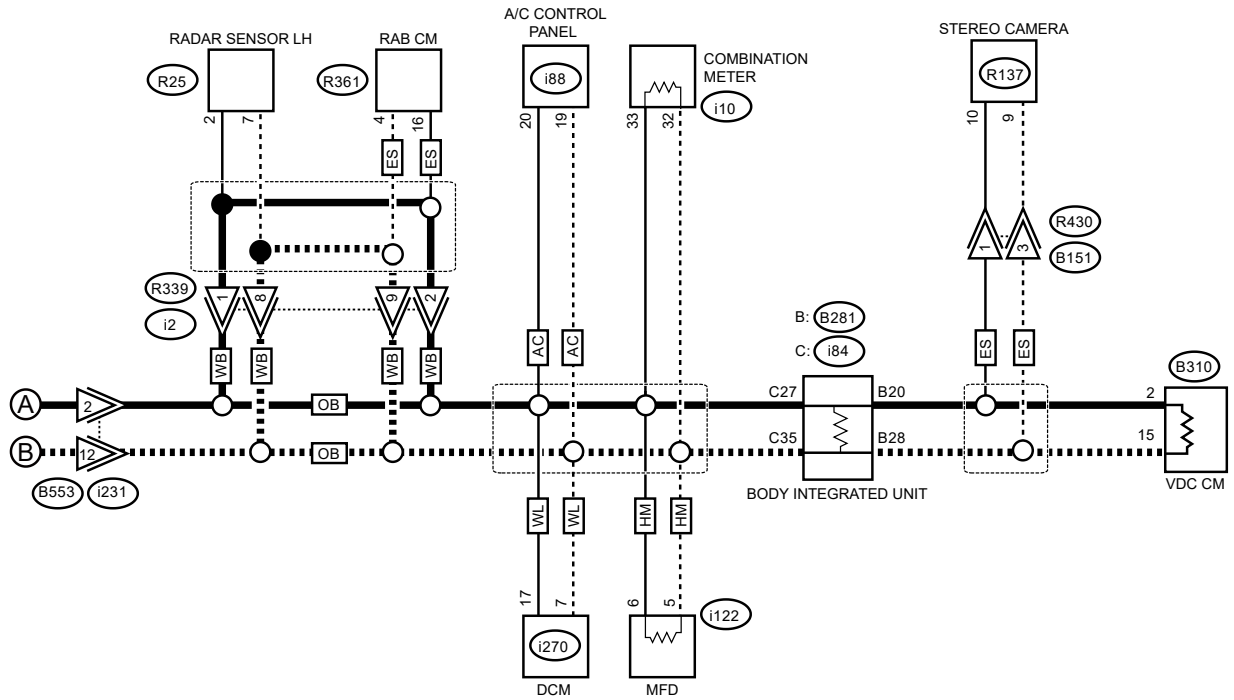
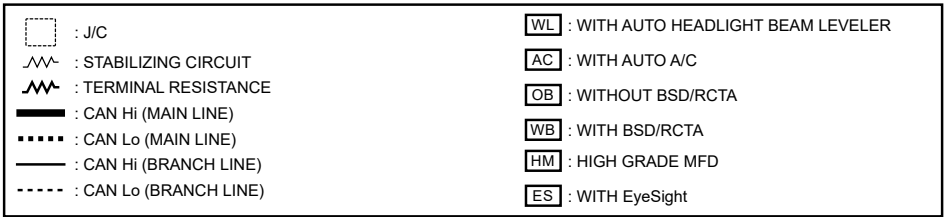
• Turbo model





LAN10706





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Note:

Perform inspection when no data is received, or faulty is detected. This is different from power supply shorted or ground shorted.

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the TCM connector.
2. Using the tester, measure the resistance between terminals.

Connector & terminal

(B54) No. 43 — No. 44:




Is the resistance 400 Ω or more?

Yes

Related lines between TCM and main wiring harness is open, or main wiring harness is open at two places or more.

No

 [Go to 2.](#)

2. CHECK RELATED LINES.



Using the tester, measure the resistance between terminals.

Connector & terminal

(B54) No. 44 — (B40) No. 14:


(B54) No. 43 — (B40) No. 6:

Is the resistance 10 Ω or more?

Yes

Repair or replace the open circuit of TCM related lines.

No

Check DTC of TCM.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

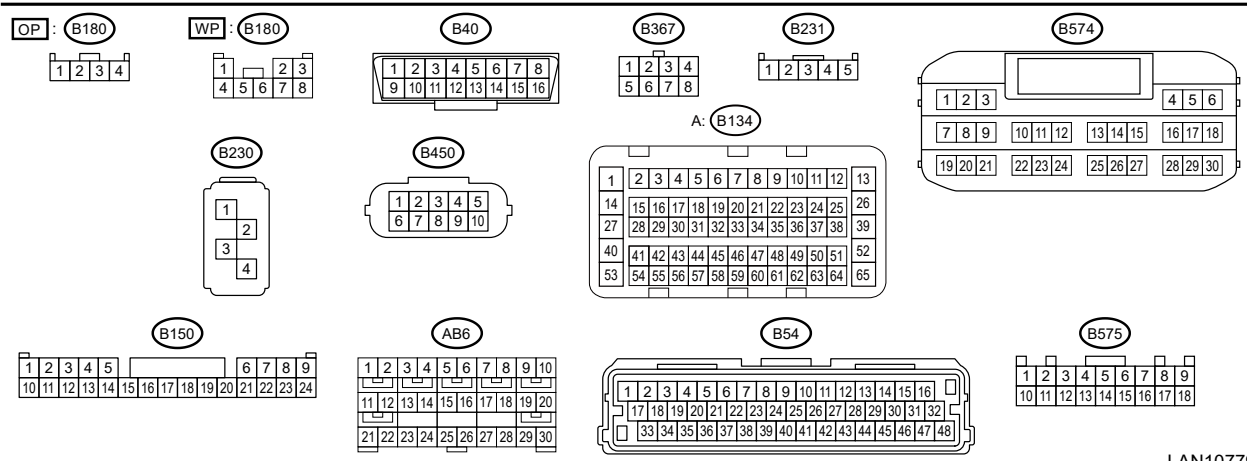
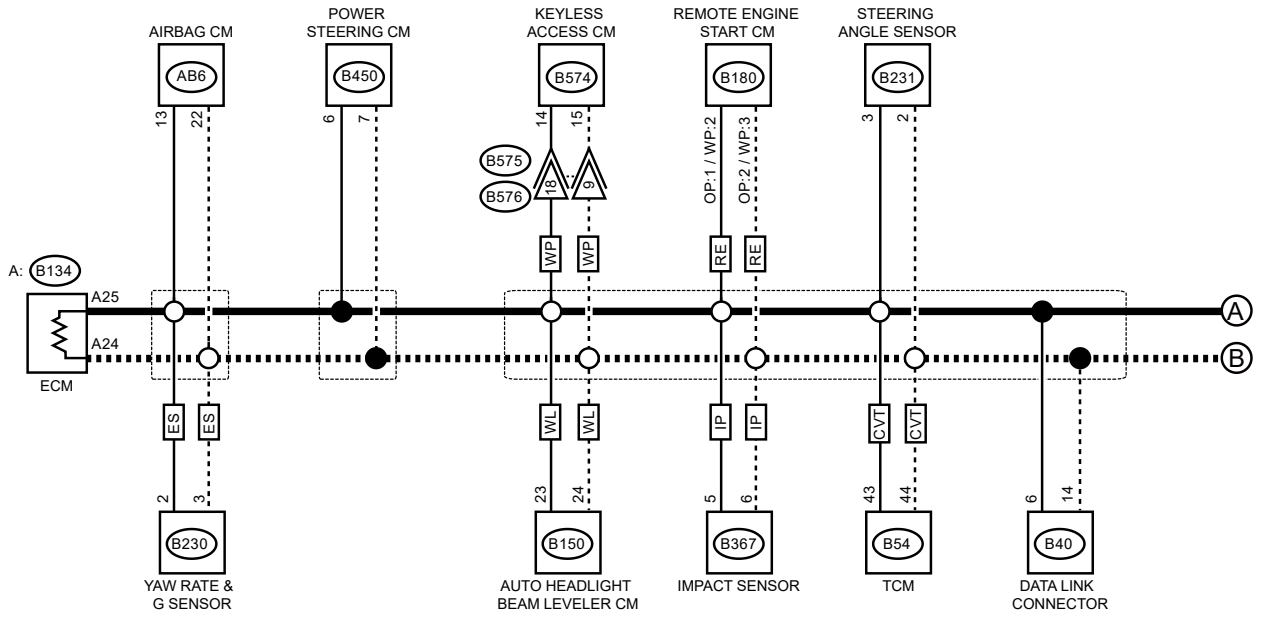
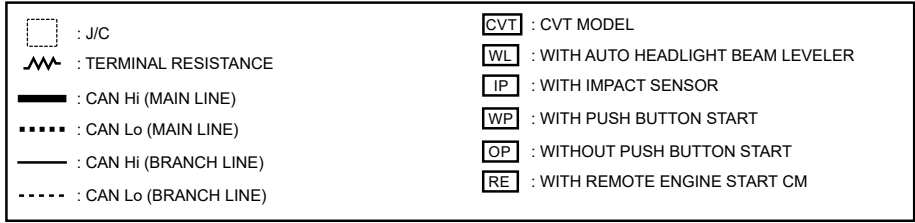
7. RELATED LINES 53 — 61 Ω (STEERING ANGLE SENSOR)

Wiring diagram:

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)

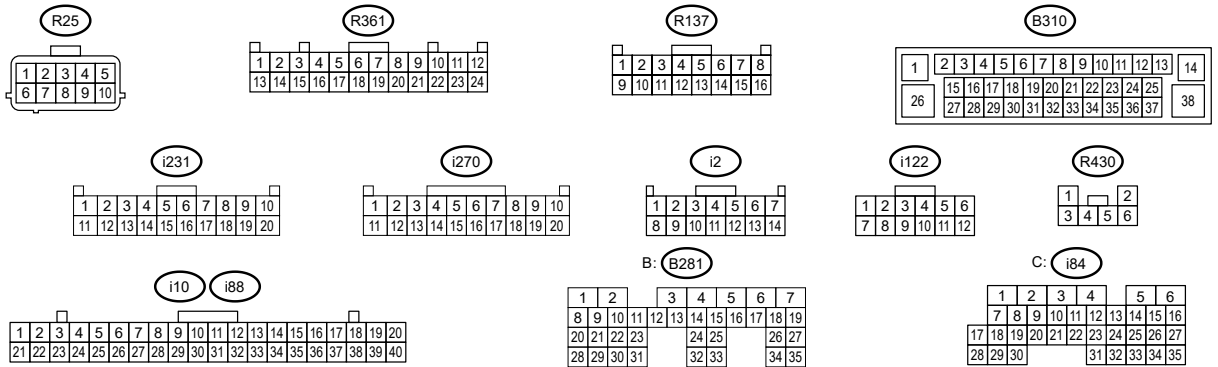
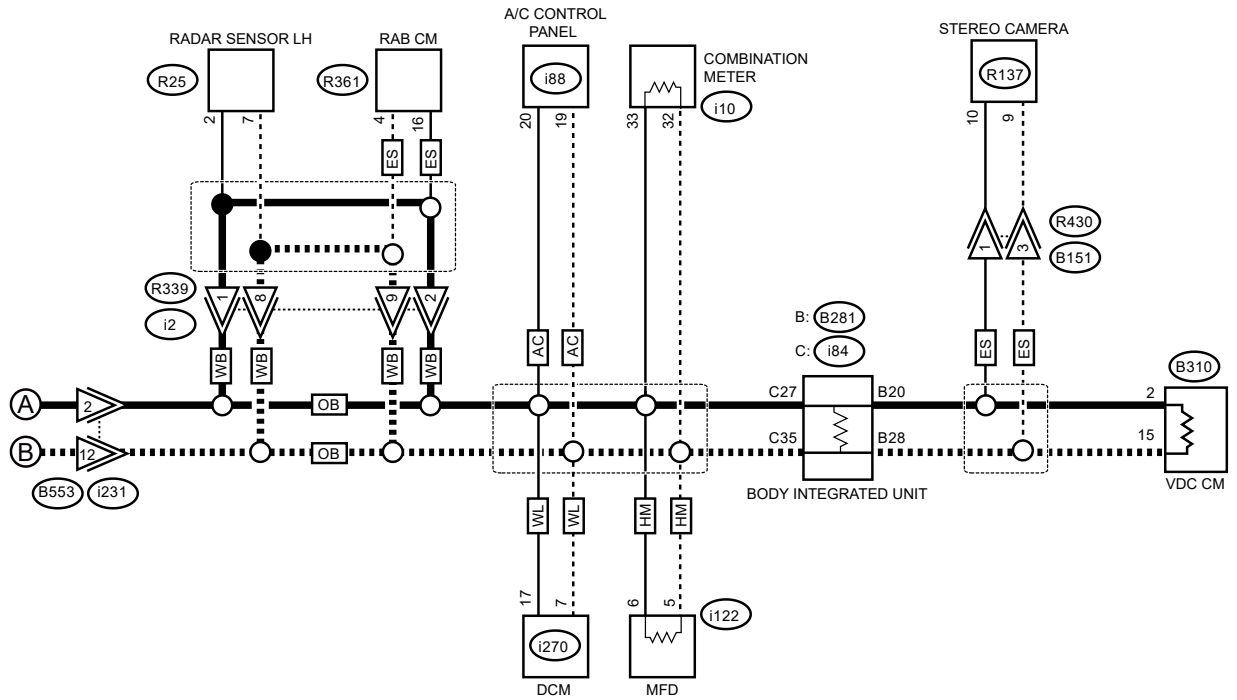
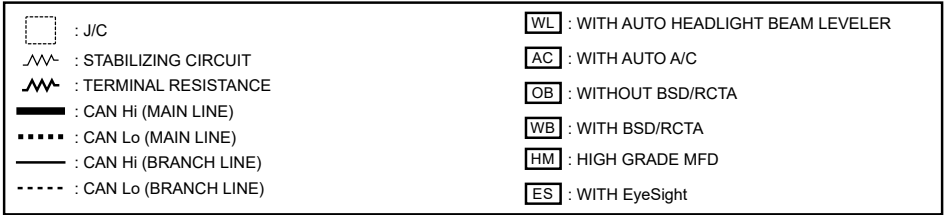
- Non-turbo model





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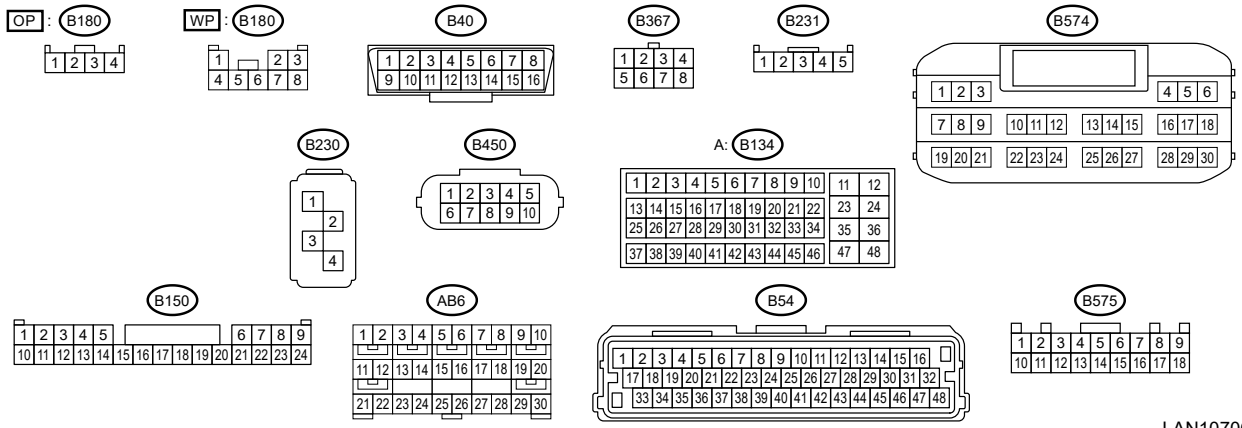
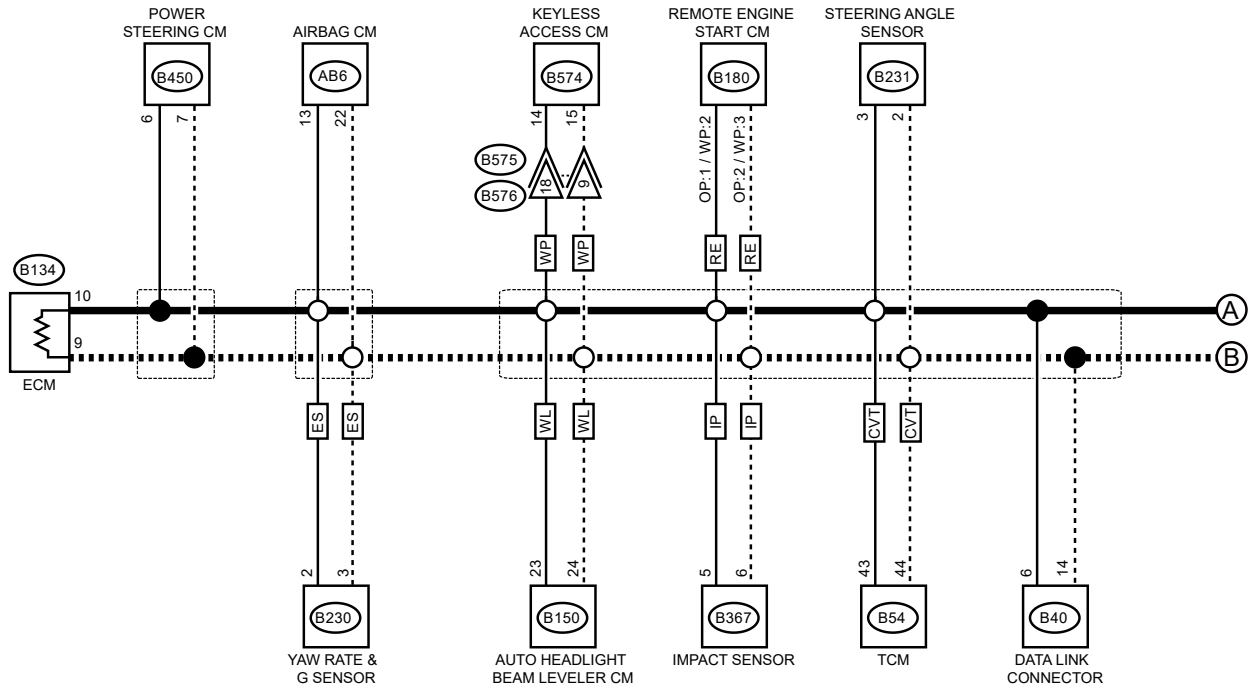
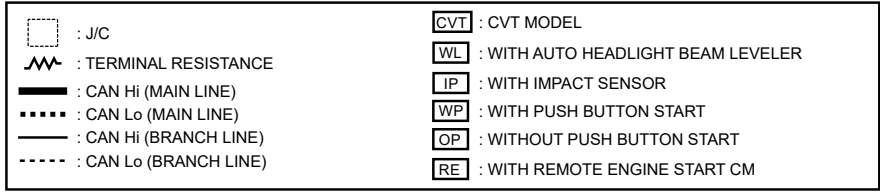




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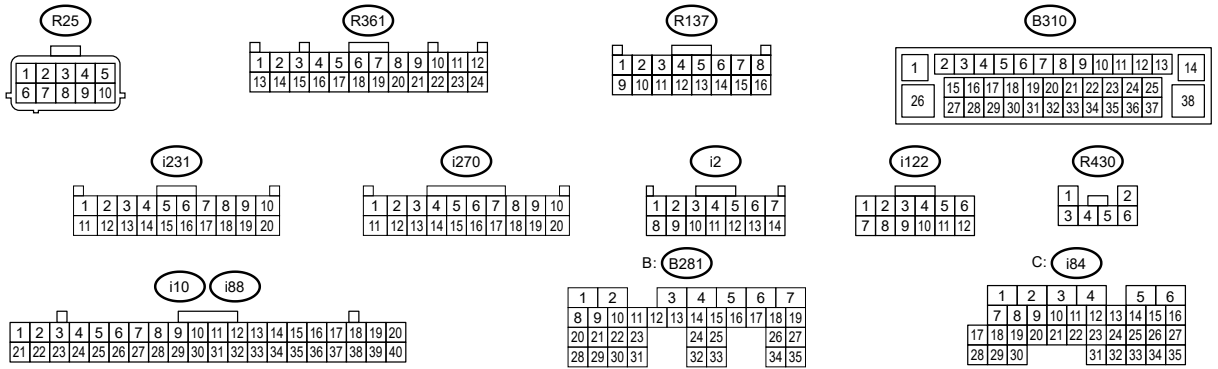
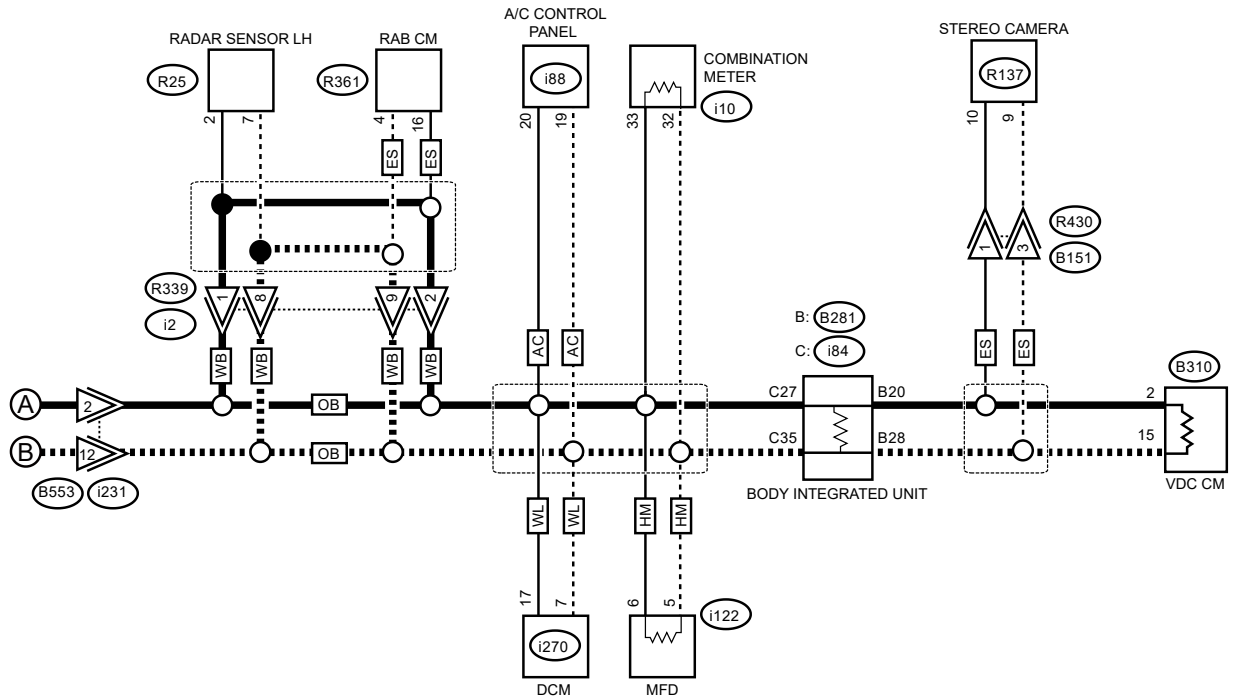
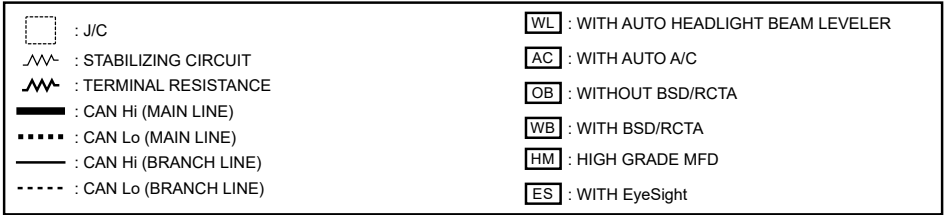
• Turbo model





LAN10706





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1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the steering angle sensor connector.
2. Using the tester, measure the resistance between terminals.

Connector & terminal
(B231) No. 2 — No. 3:

Is the resistance 400 Ω or more?



Related lines between steering angle sensor and main wiring harness is open, or

Yes

main wiring harness is open at two places or more.

No

 [Go to 2.](#)

2. CHECK RELATED LINES.

Using the tester, measure the resistance between terminals.

Connector & terminal

(B231) No. 2 — (B40) No. 14:


(B231) No. 3 — (B40) No. 6:

Is the resistance 10 Ω or more?

Yes

Repair or replace the open circuit of steering angle sensor related lines.

No

Check DTC of VDC CM.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

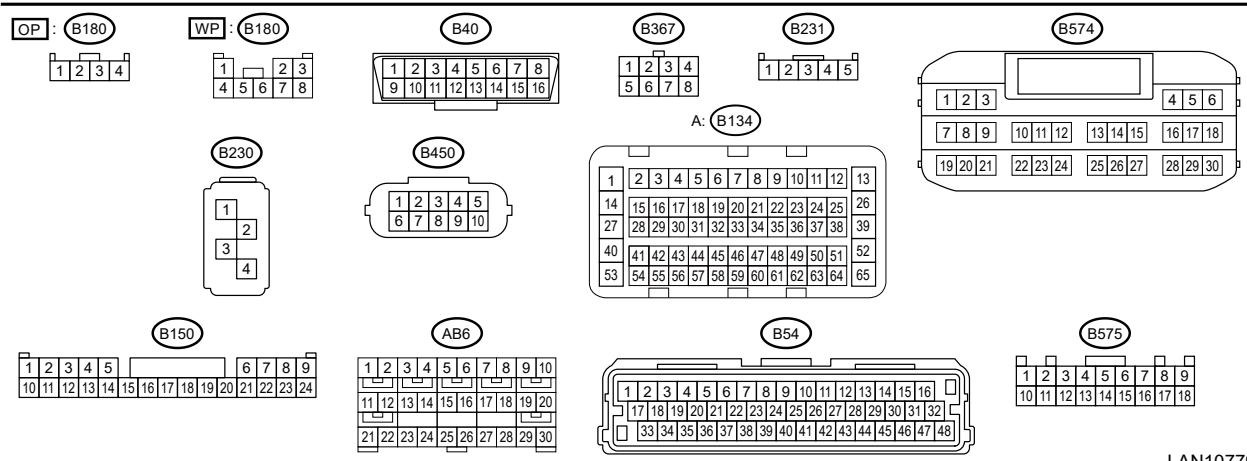
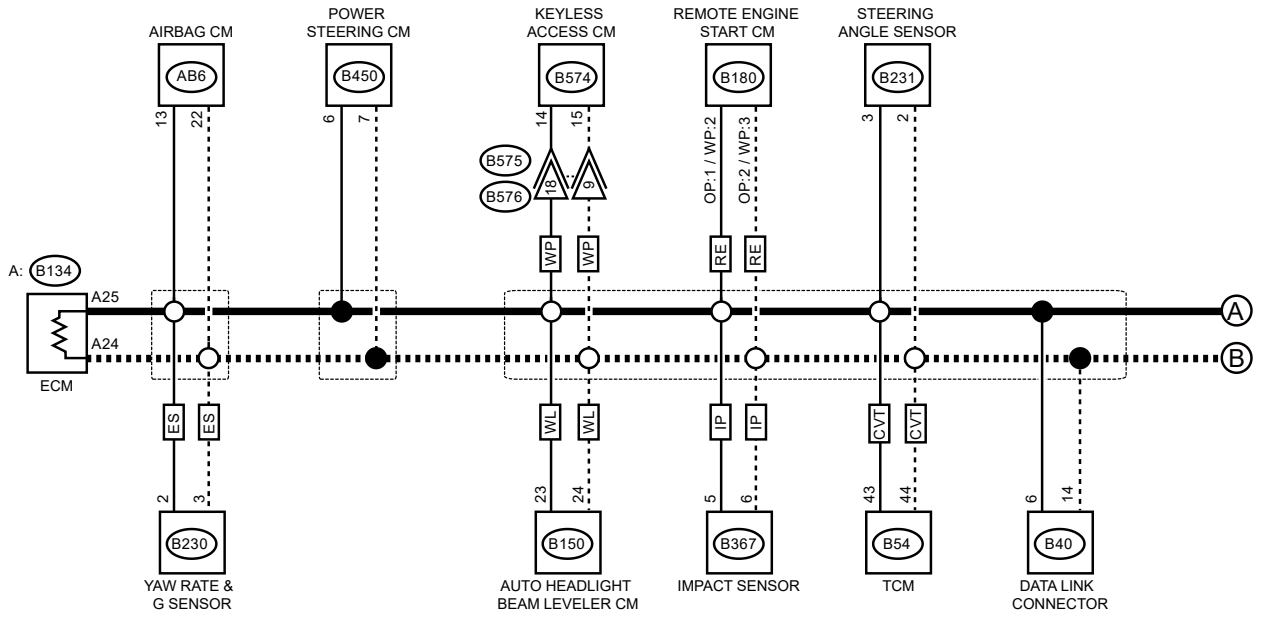
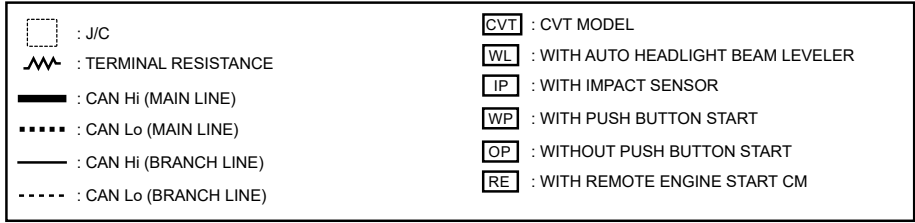
8. RELATED LINE 53 — 61 Ω (A/C CONTROL PANEL)

Wiring diagram:

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)

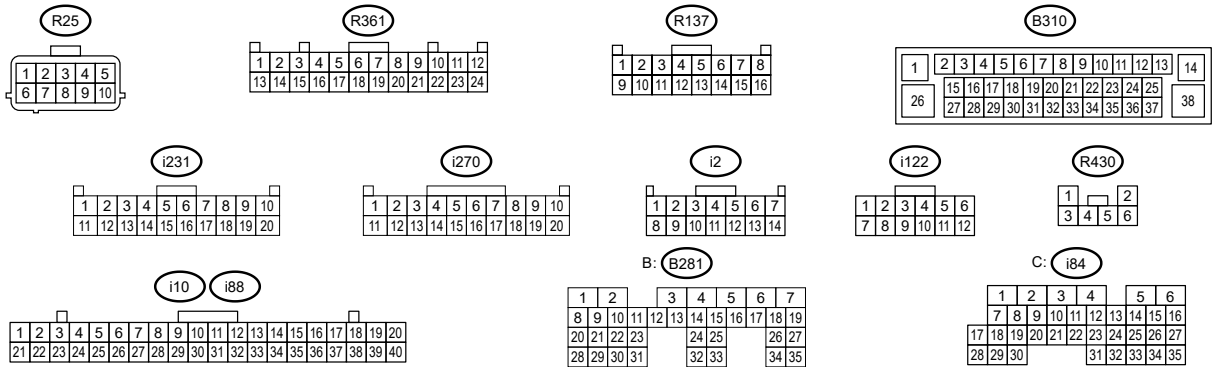
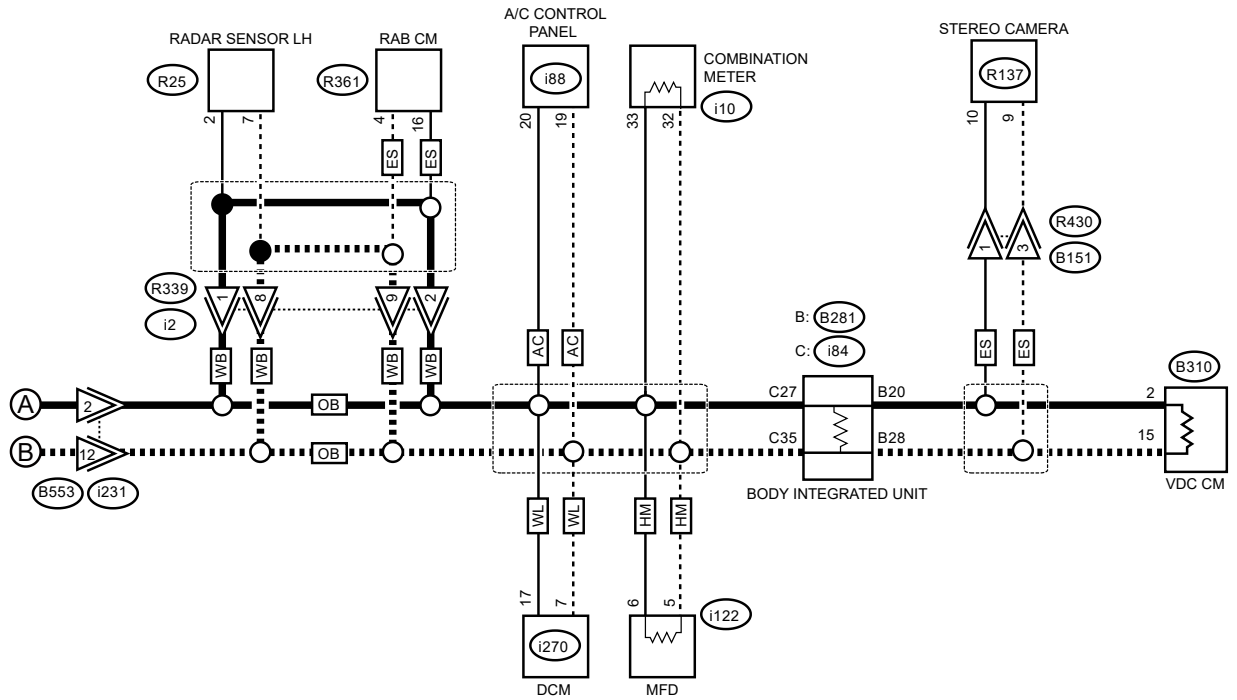
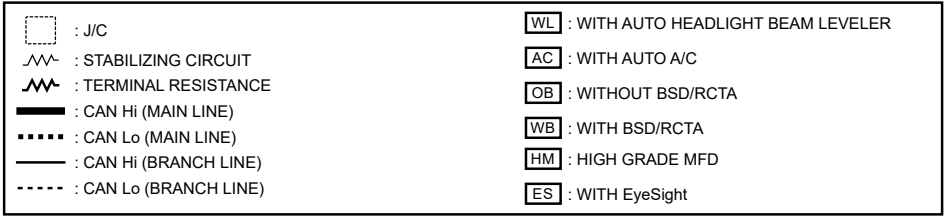
- Non-turbo model





LAN10779

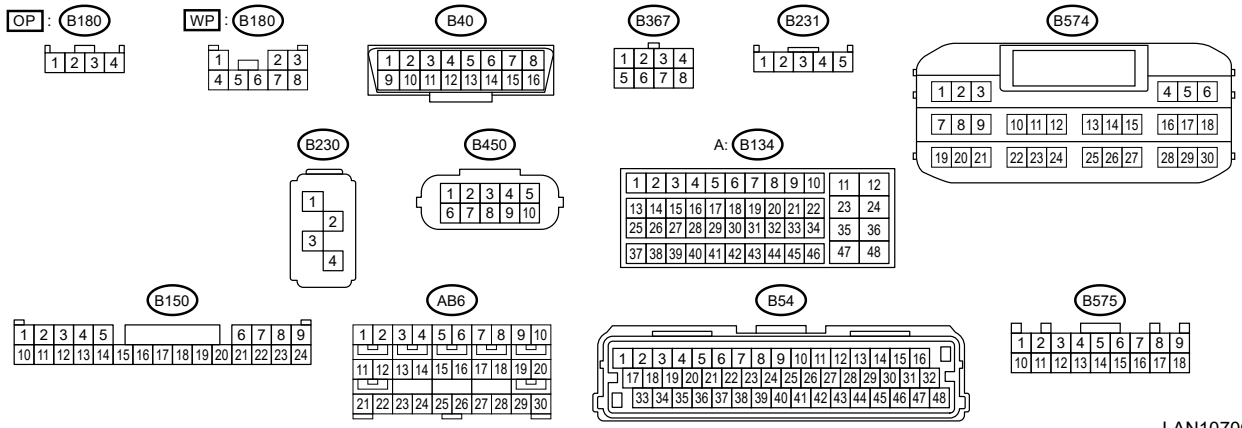
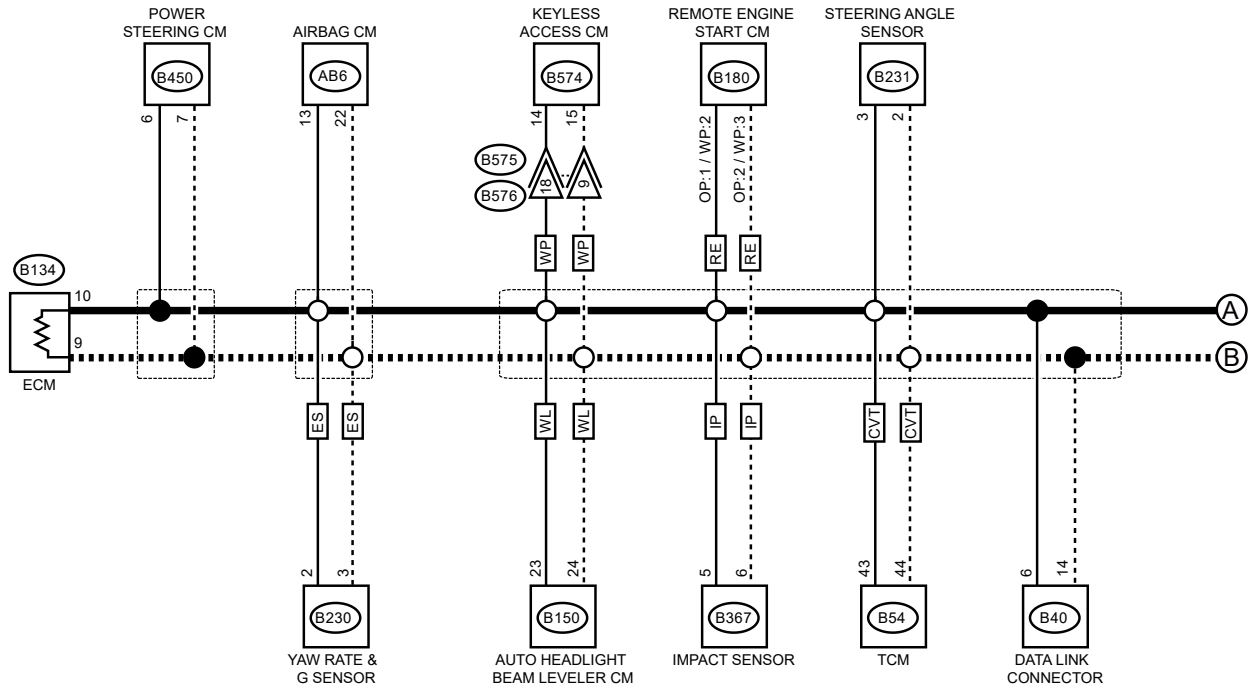
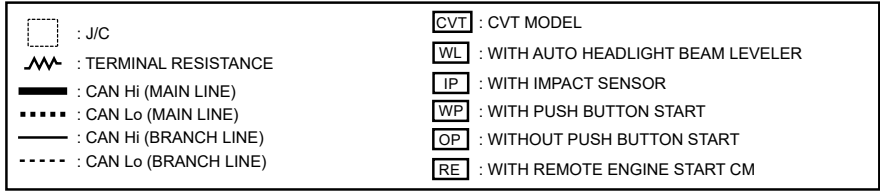




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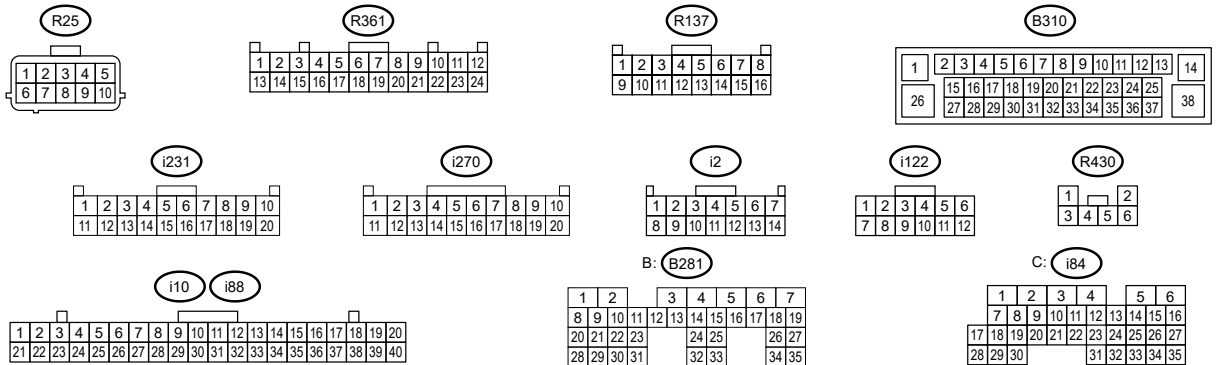
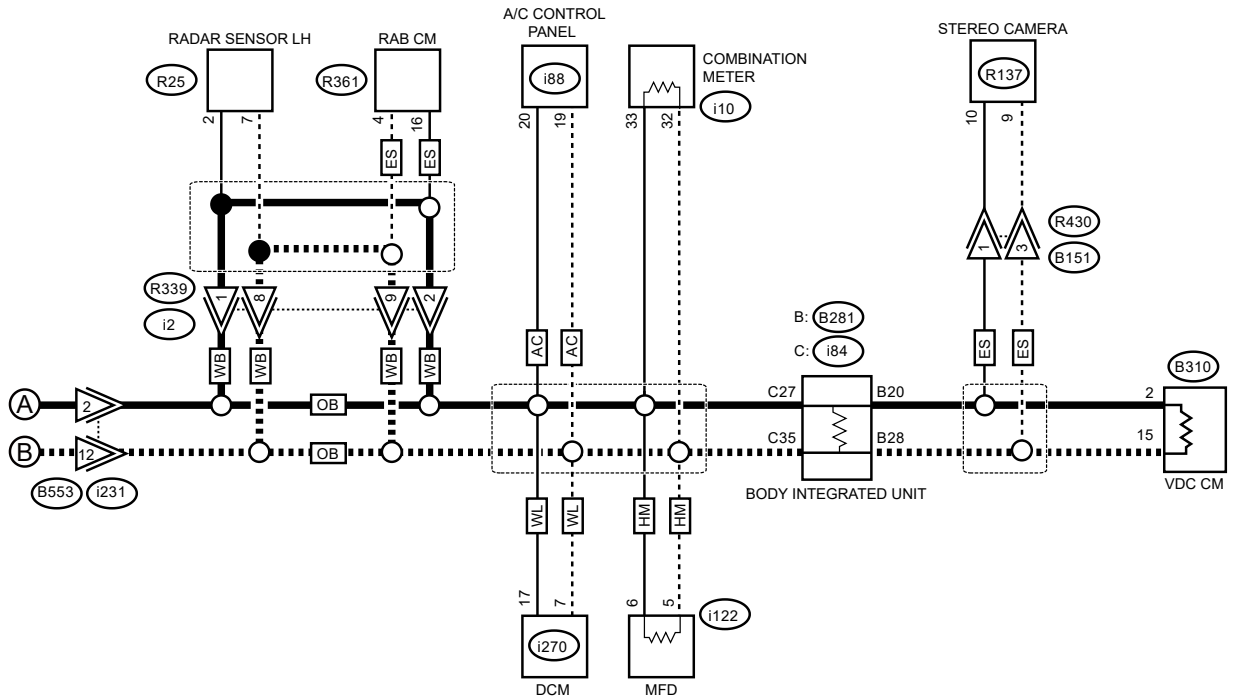
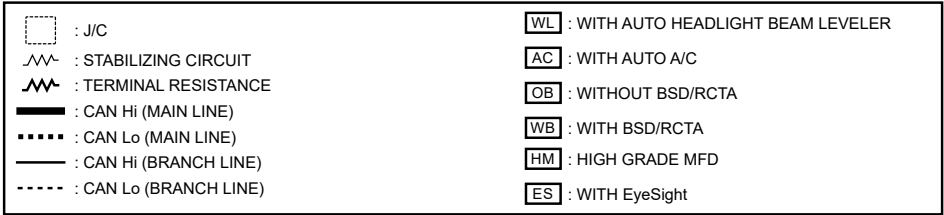
• Turbo model





LAN10706





LAN10705

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the A/C control panel connector.
2. Using the tester, measure the resistance between terminals.

Connector & terminal

(i88) No. 19 — No. 20:

Is the resistance 400 Ω or more?




Related lines between A/C control panel and main wiring harness is open, or main

Yes

wiring harness is open at two places or more.

No

 [Go to 2.](#)

2. CHECK RELATED LINES.

Using the tester, measure the resistance between terminals.

Connector & terminal

(i88) No. 19 — (B40) No. 14:


(i88) No. 20 — (B40) No. 6:

Is the resistance 10 Ω or more?

Yes


Repair or replace the open circuit of A/C control panel related lines.

No

Check the DTC of A/C control panel.  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

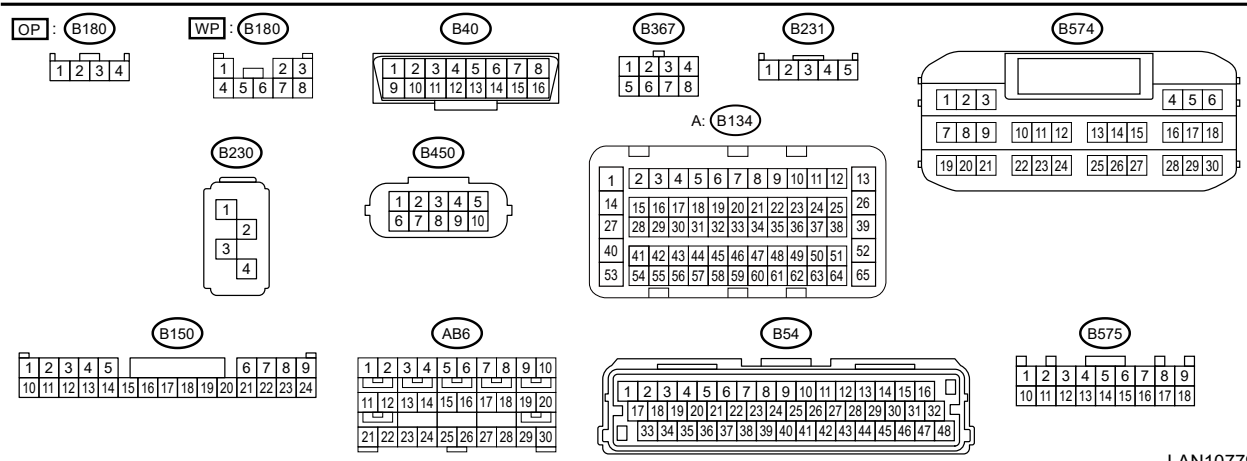
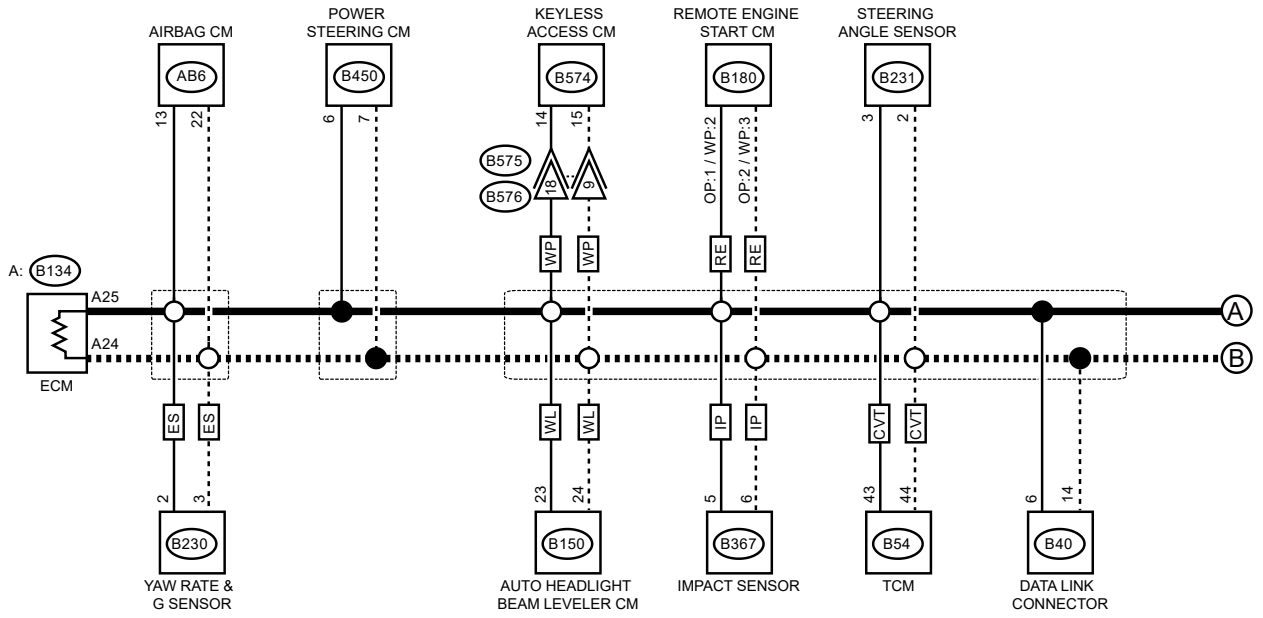
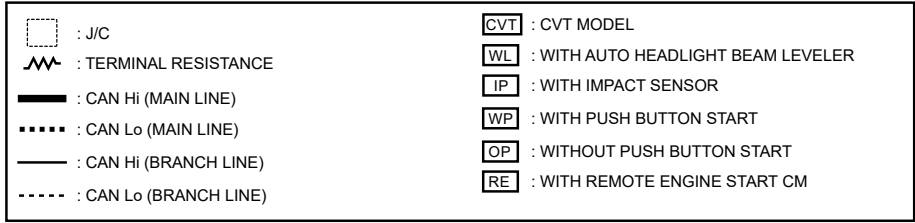
9. RELATED LINES 53 — 61 Ω (POWER STEERING CM)

Wiring diagram:

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)

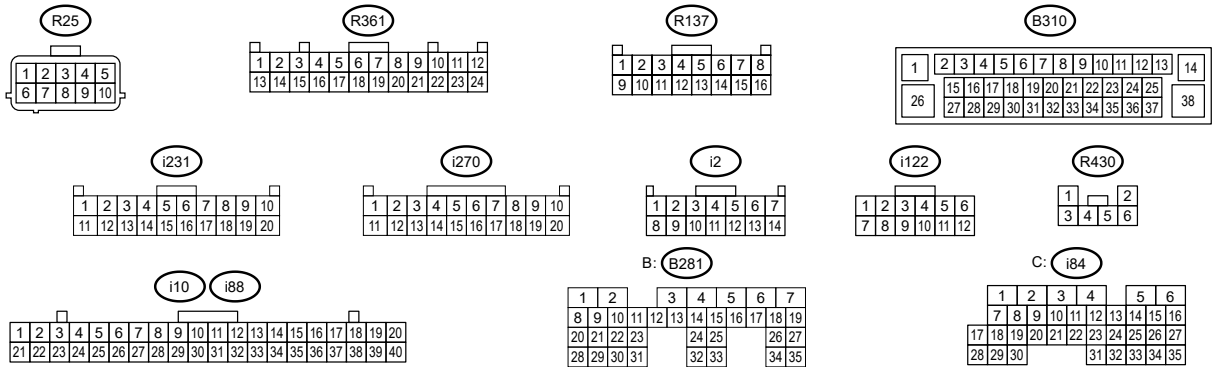
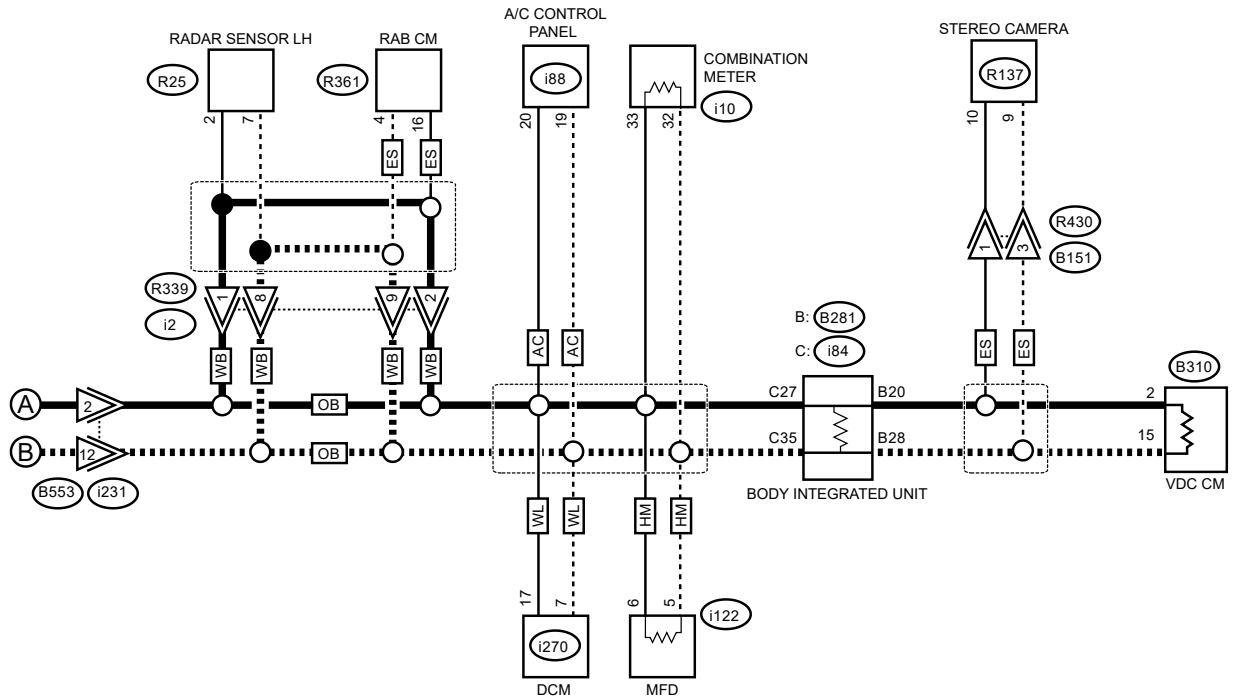
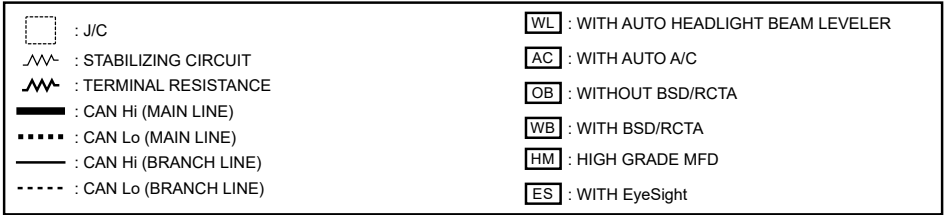
- Non-turbo model





LAN10779

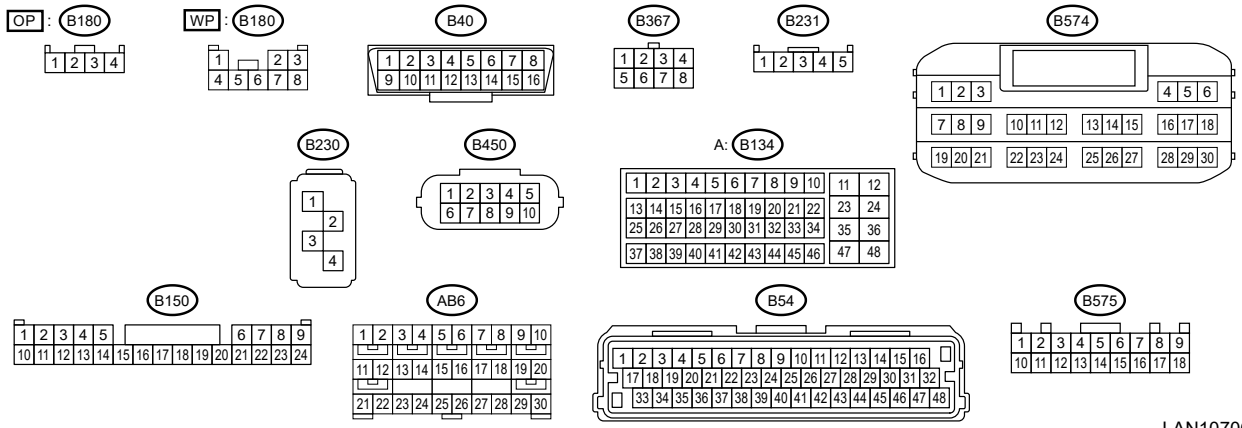
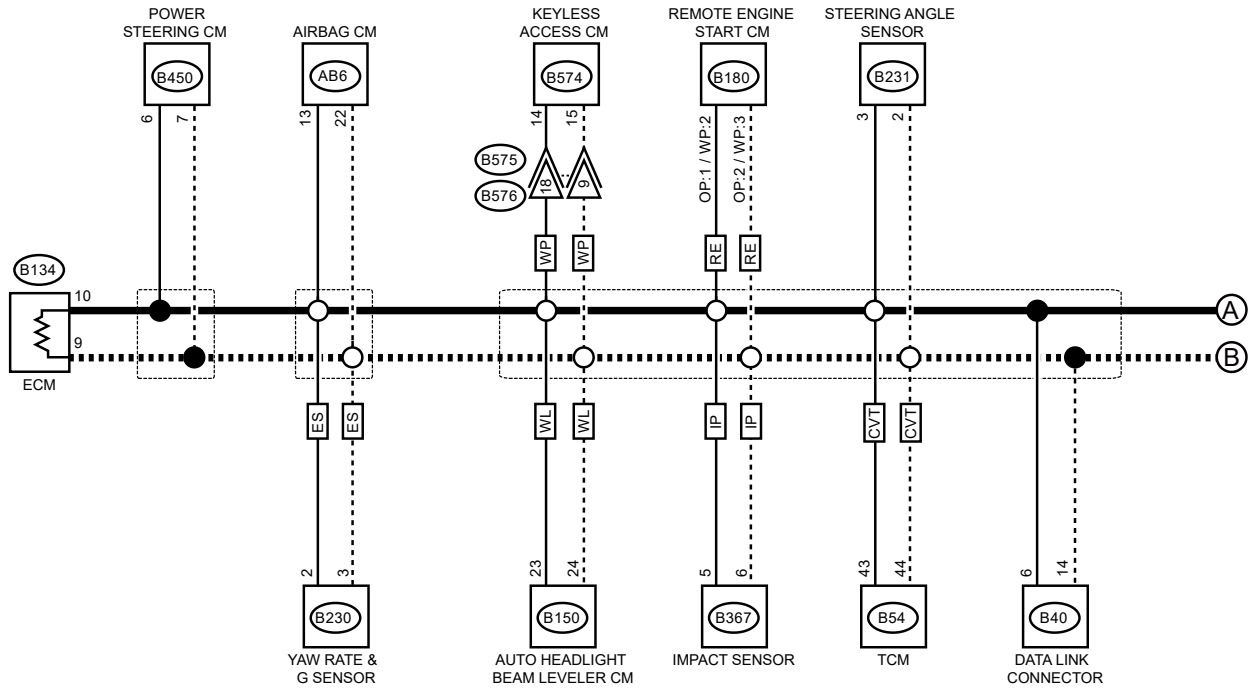
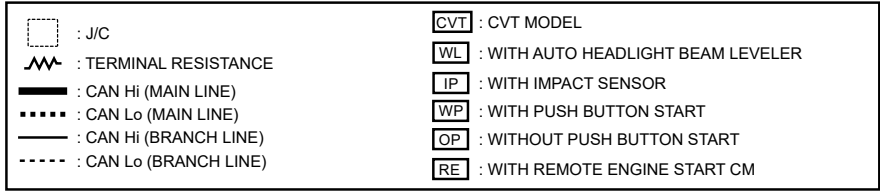




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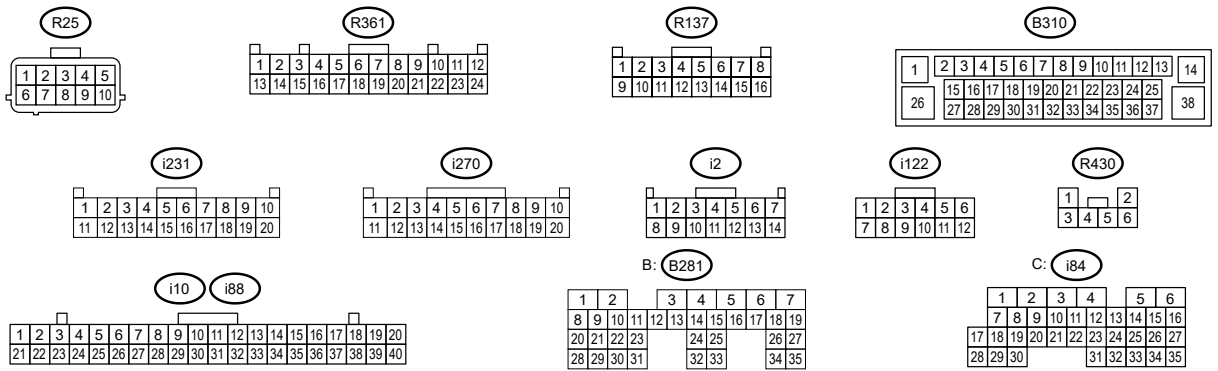
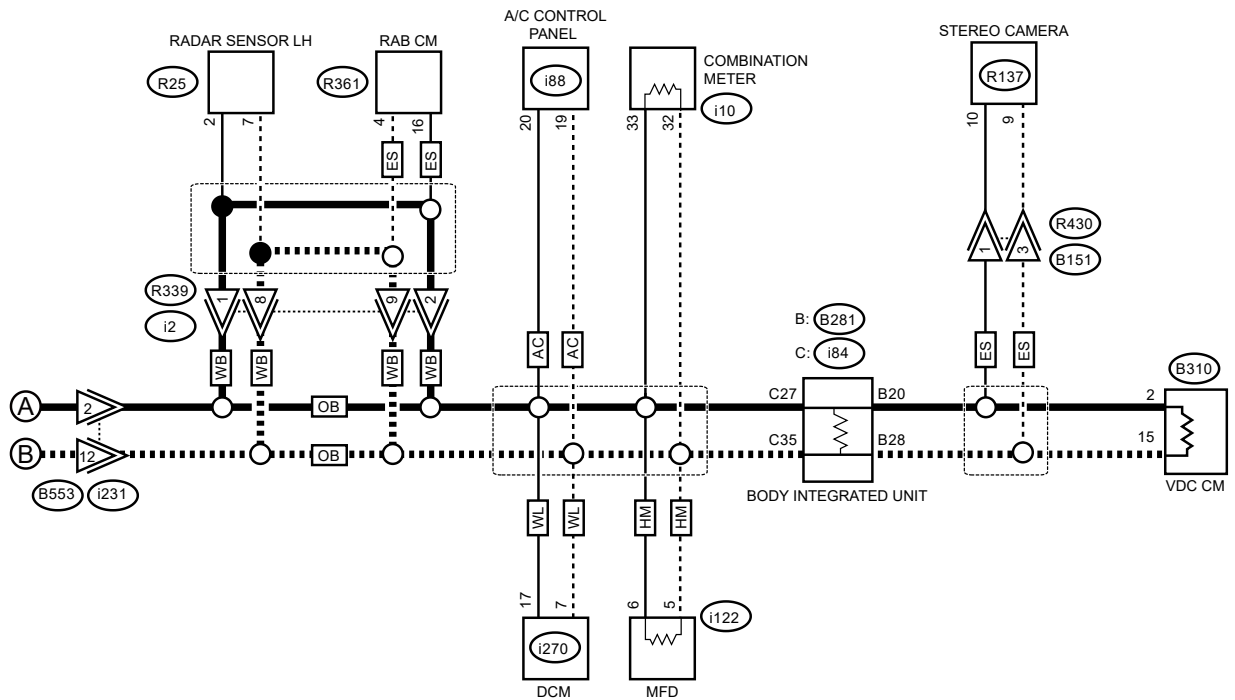
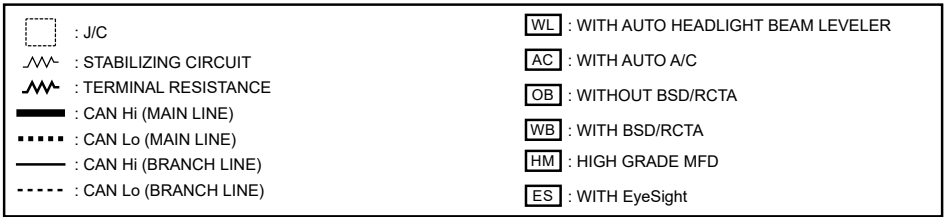
• Turbo model





LAN10706





LAN10705

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the power steering CM connector.
2. Using the tester, measure the resistance between terminals.

Connector & terminal
(B450) No. 6 — No. 7:

Is the resistance 400 Ω or more?




Related lines or main wiring harness between power steering CM and main wiring

Yes

harness is open at two places or more.

No

 [Go to 2.](#)

2. CHECK RELATED LINES.

Using the tester, measure the resistance between terminals.

Connector & terminal

(B450) No. 6 — (B40) No. 6:


(B450) No. 7 — (B40) No. 14:

Is the resistance 10 Ω or more?

Yes

Repair or replace the open circuit portion of power steering CM related lines.

No

Check DTC of power steering CM.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

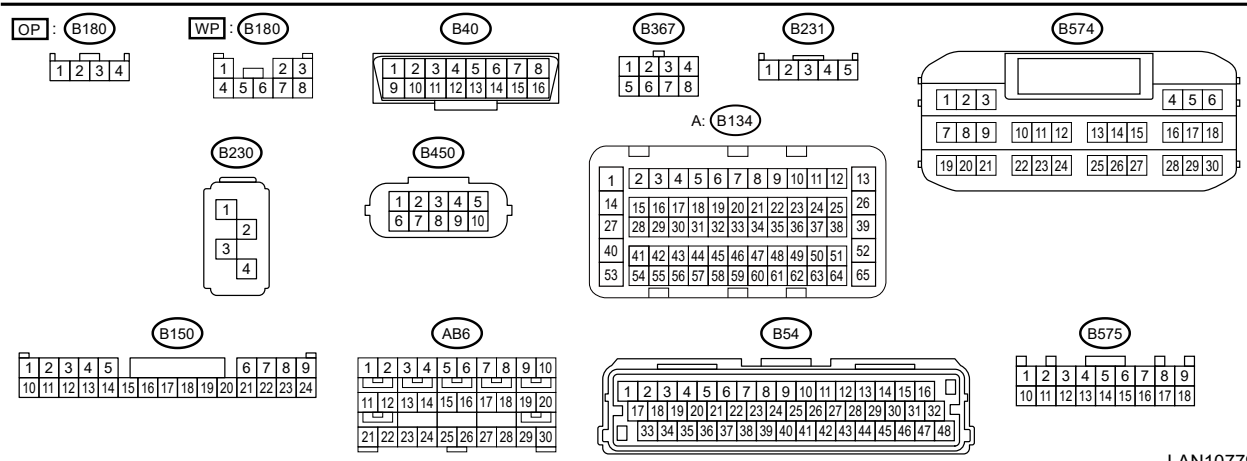
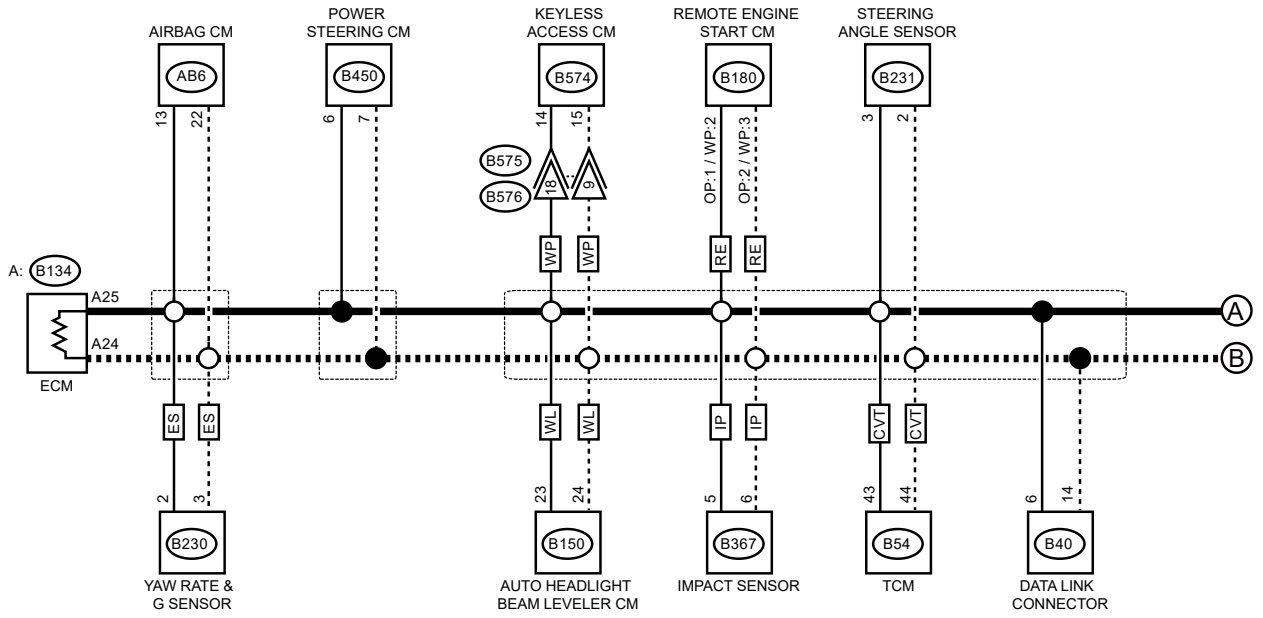
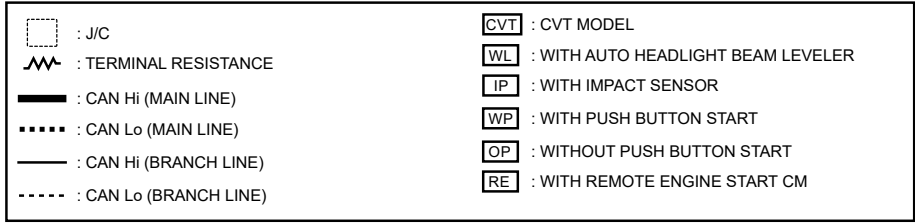
10. RELATED LINES 53 — 61 Ω (COMBINATION METER)

Wiring diagram:

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)

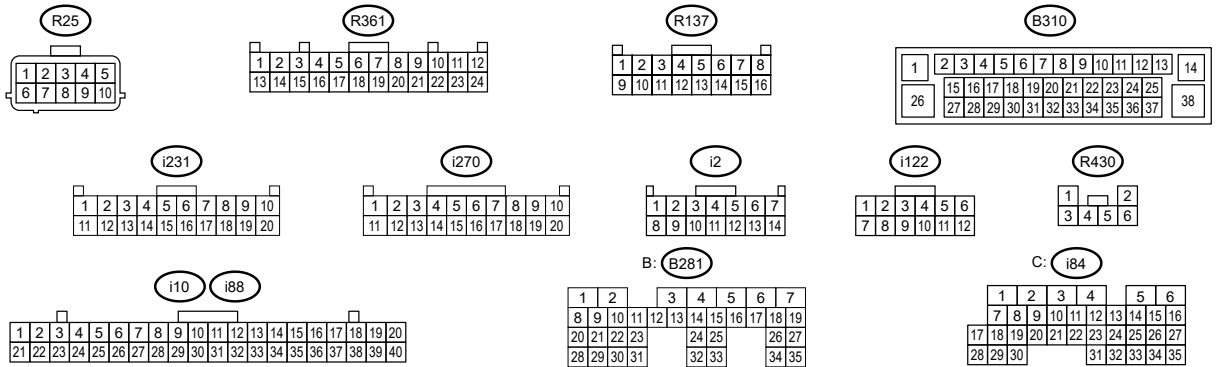
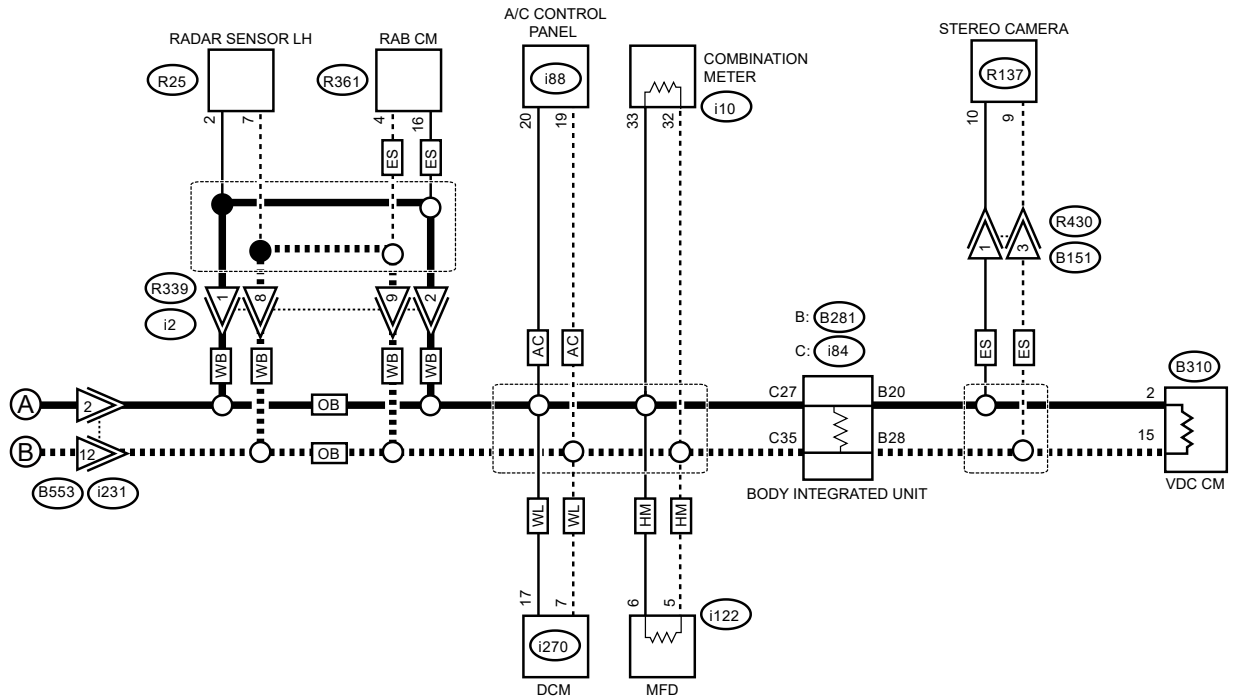
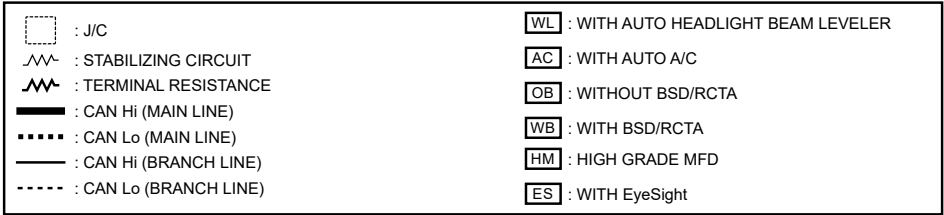
- Non-turbo model





LAN10779

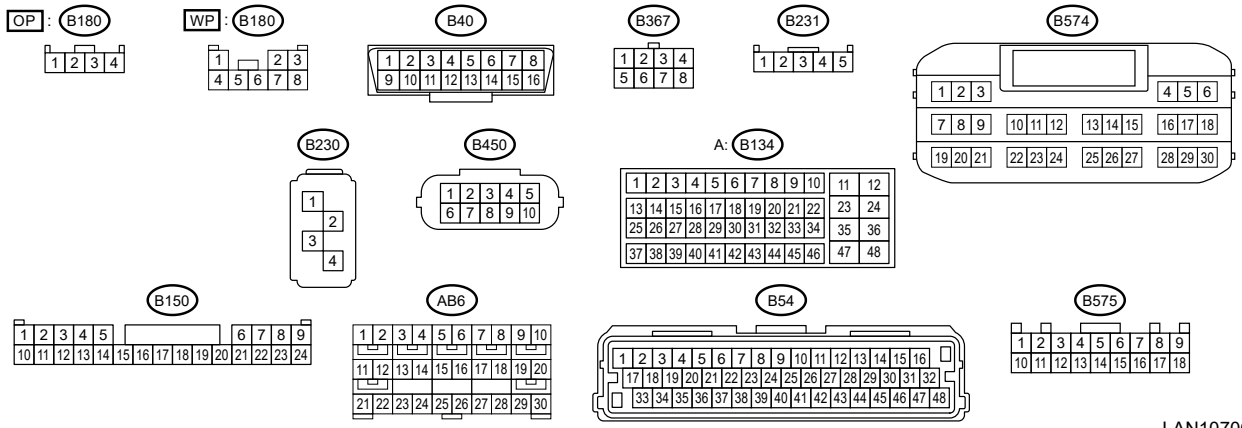
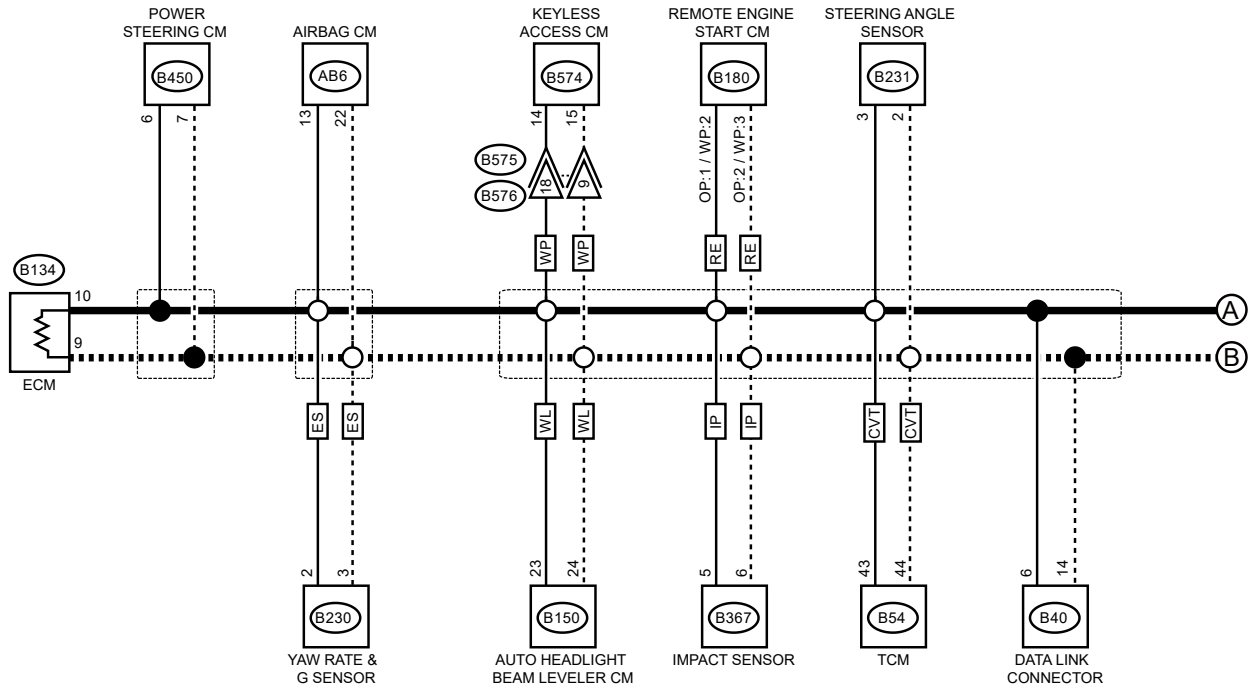
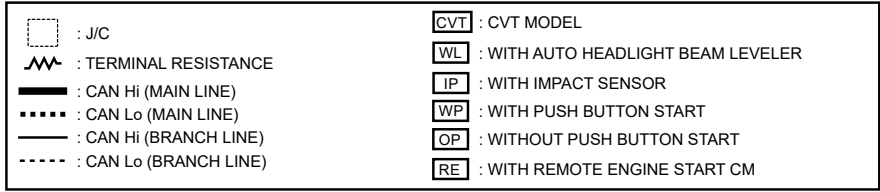




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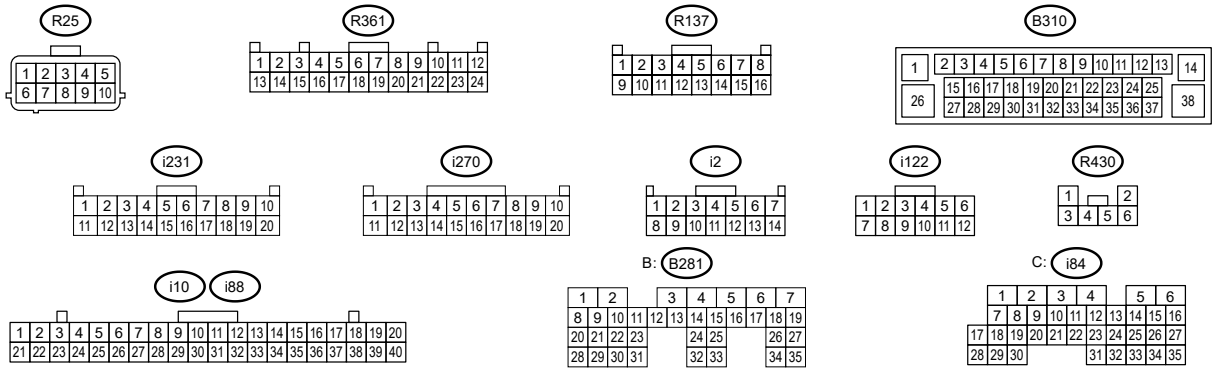
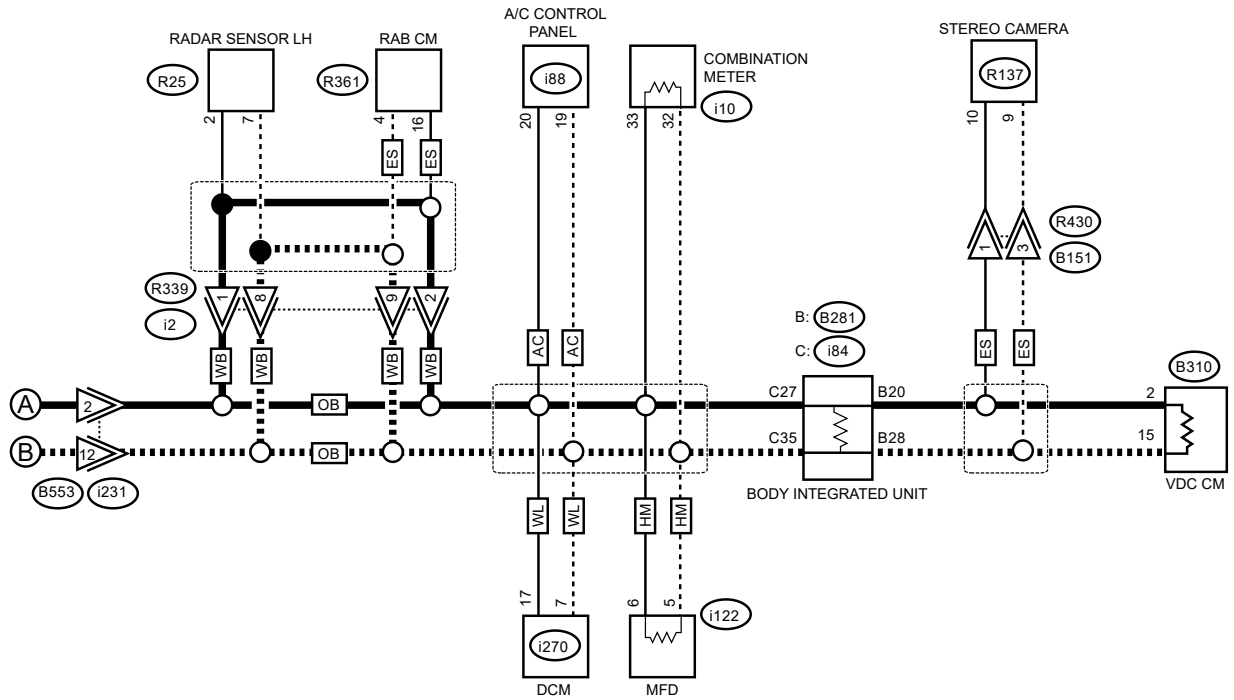
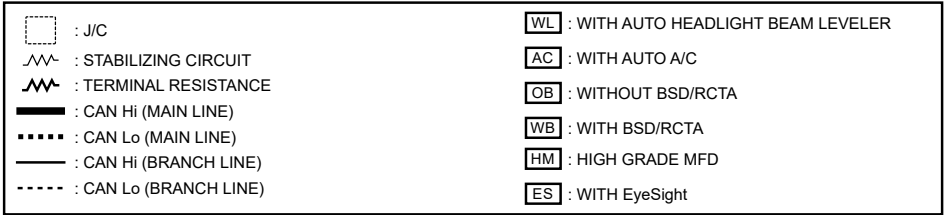
• Turbo model





LAN10706





LAN10705

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the combination meter connector.
2. Using the tester, measure the resistance between terminals.

Connector & terminal
(i10) No. 32 — No. 33:

Is the resistance 400 Ω or more?




Related lines between combination meter and main wiring harness is open, or

Yes

main wiring harness is open at two places or more.

No

 [Go to 2.](#)

2. CHECK RELATED LINES.

Using the tester, measure the resistance between terminals.

Connector & terminal

(i10) No. 32 — (B40) No. 14:


(i10) No. 33 — (B40) No. 6:

Is the resistance 10 Ω or more?

Yes


Repair or replace the open circuit of combination meter related lines.

No

Check DTC of combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

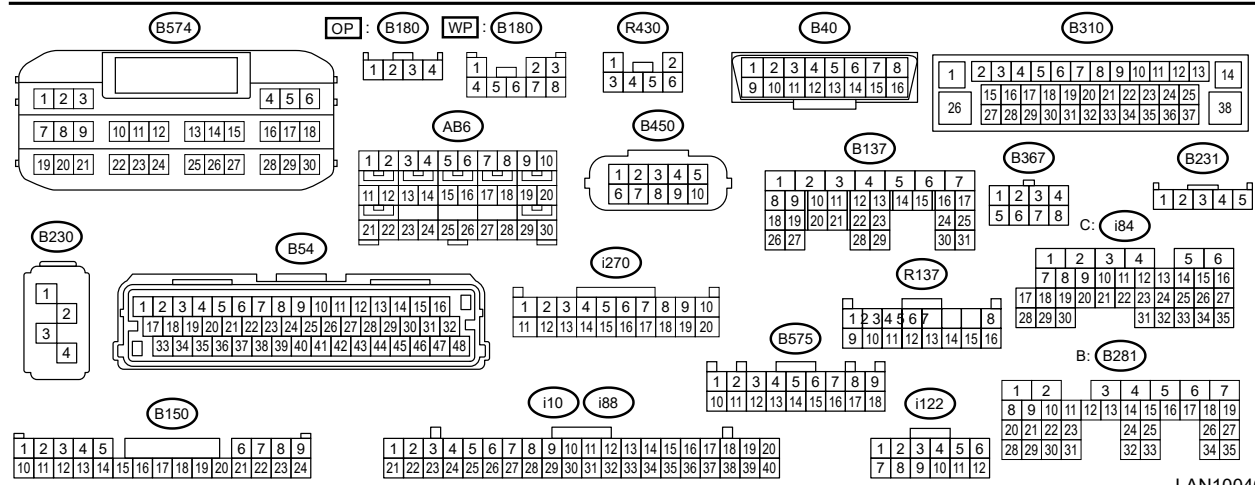
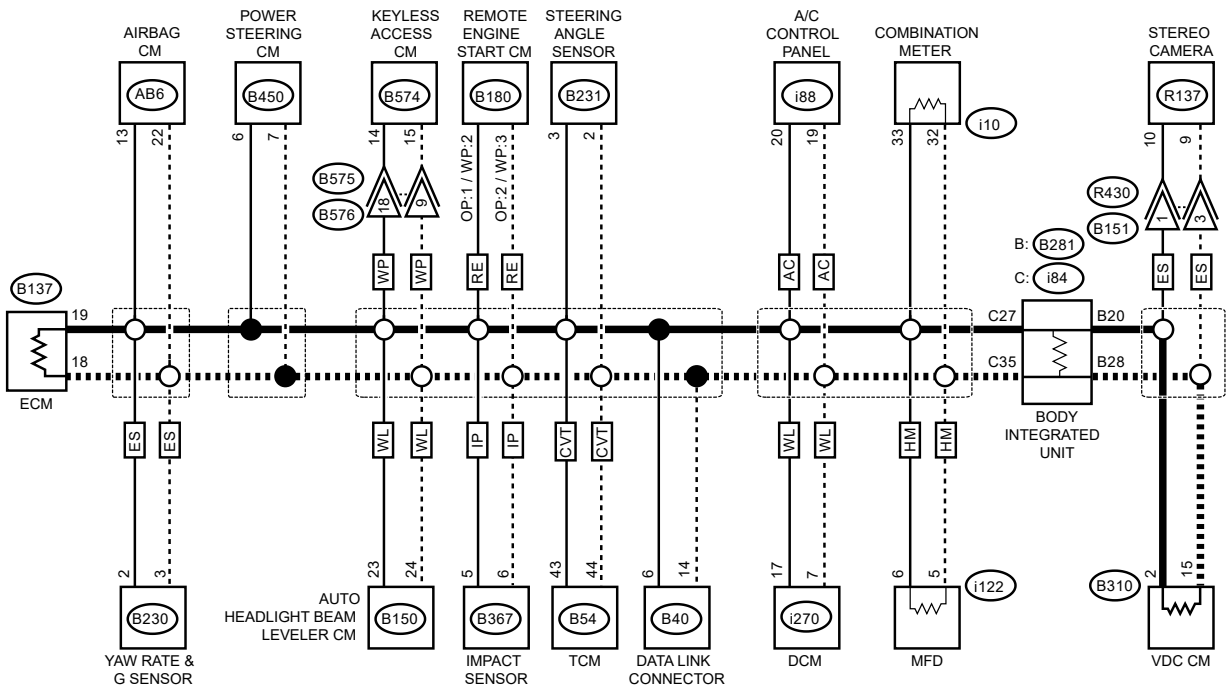
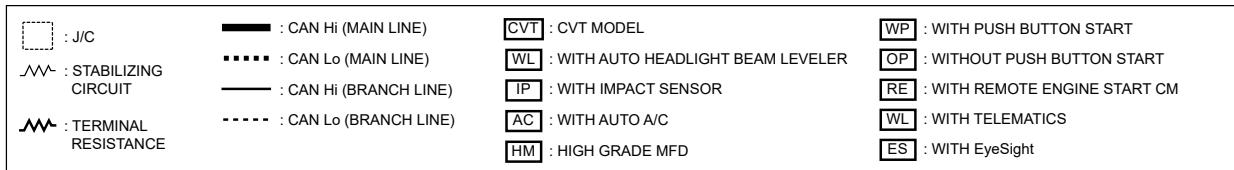
11. RELATED LINES 53 — 61 Ω (MFD)

Wiring diagram:

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)

- Non-turbo model

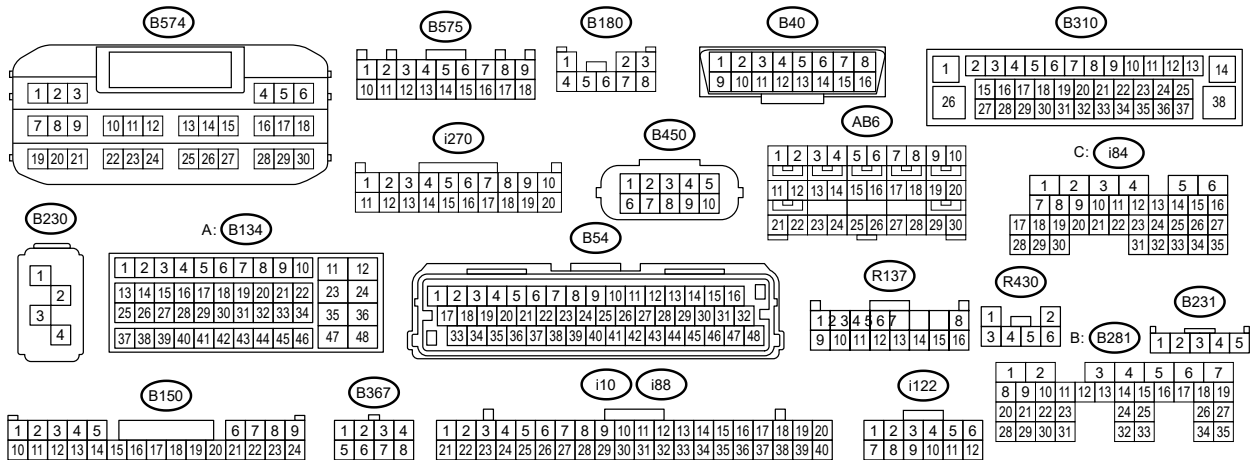
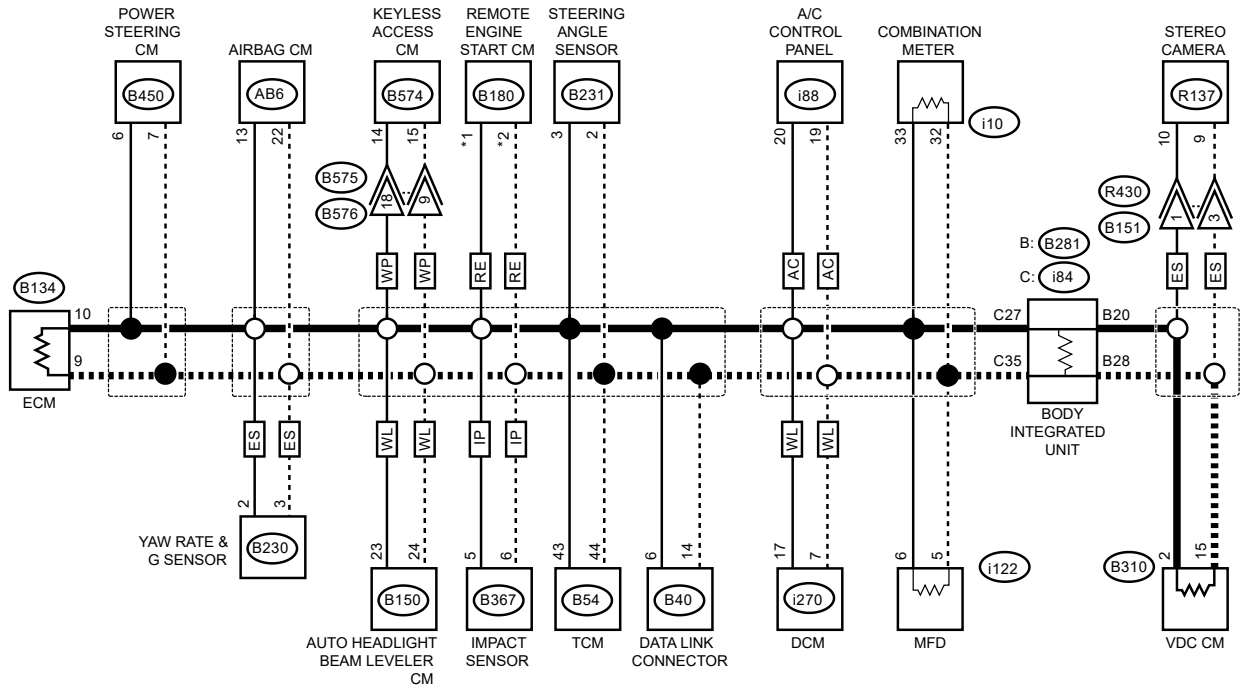
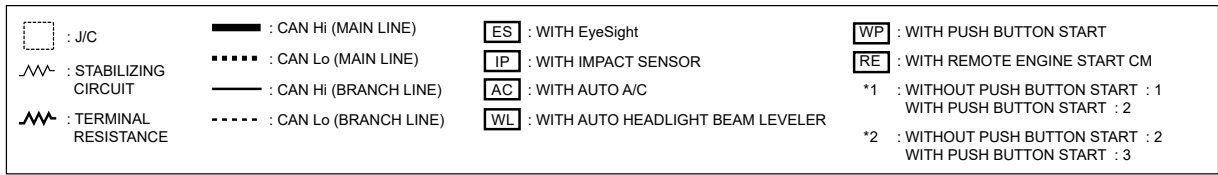




LAN10046

• Turbo model





LAN10047

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the MFD connector.
2. Using the tester, measure the resistance between terminals.

Connector & terminal
(i122) No. 5 — No. 6:

Is the resistance 400 Ω or more?

 Related lines between MFD and main wiring harness is open, or main wiring

Yes

harness is open at two places or more.

No

 [Go to 2.](#)

2. CHECK RELATED LINES.

Using the tester, measure the resistance between terminals.

Connector & terminal

(i122) No. 5 — (B40) No. 14:


(i122) No. 6 — (B40) No. 6:

Is the resistance 10 Ω or more?

Yes

Repair or replace the open circuit of MFD related lines.

No

Check DTC of MFD.  [Ref. to MULTI-FUNCTION DISPLAY\(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

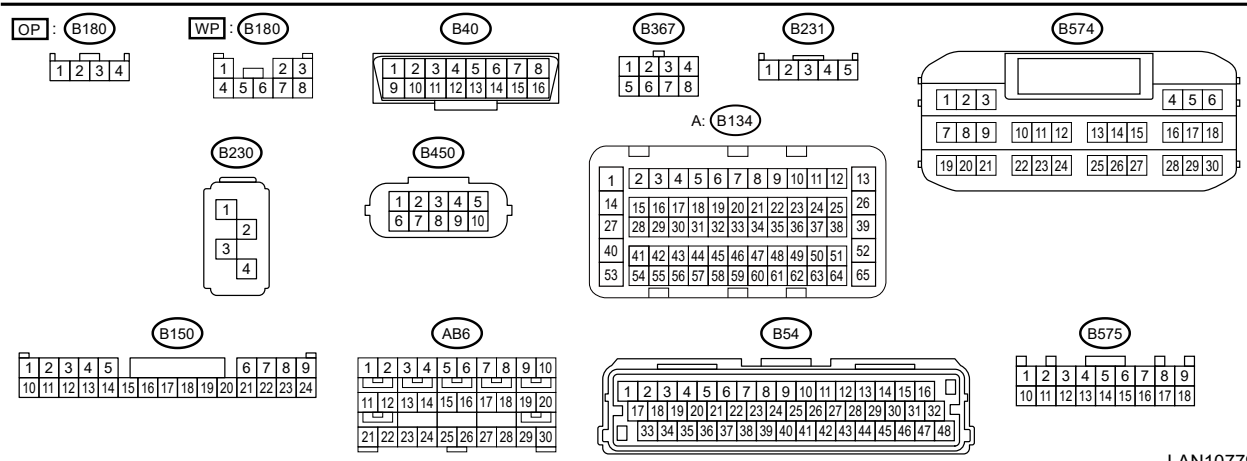
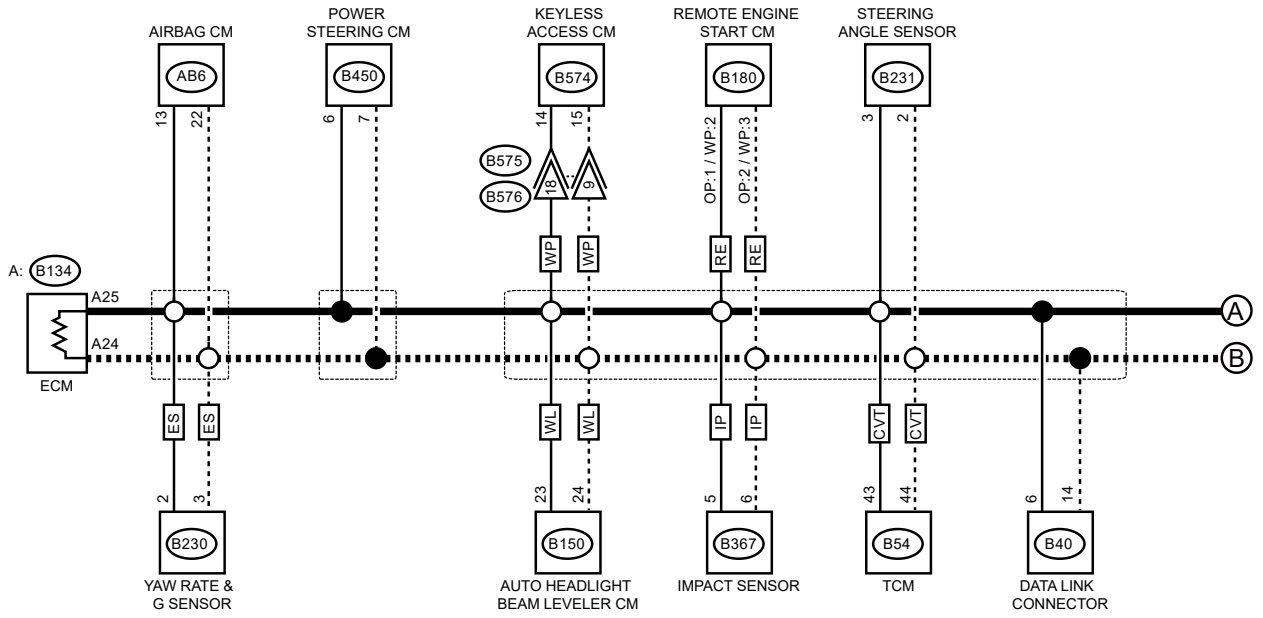
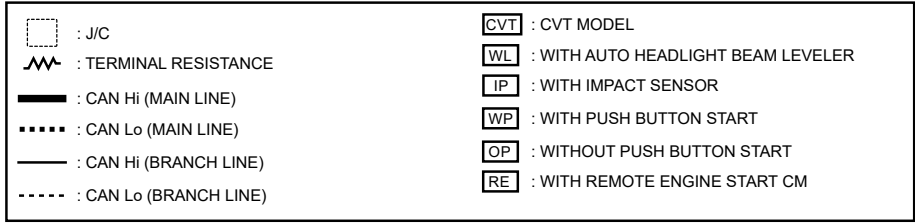
12. RELATED LINES 53 — 61 Ω (AIRBAG CM SYSTEM)

Wiring diagram:

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)

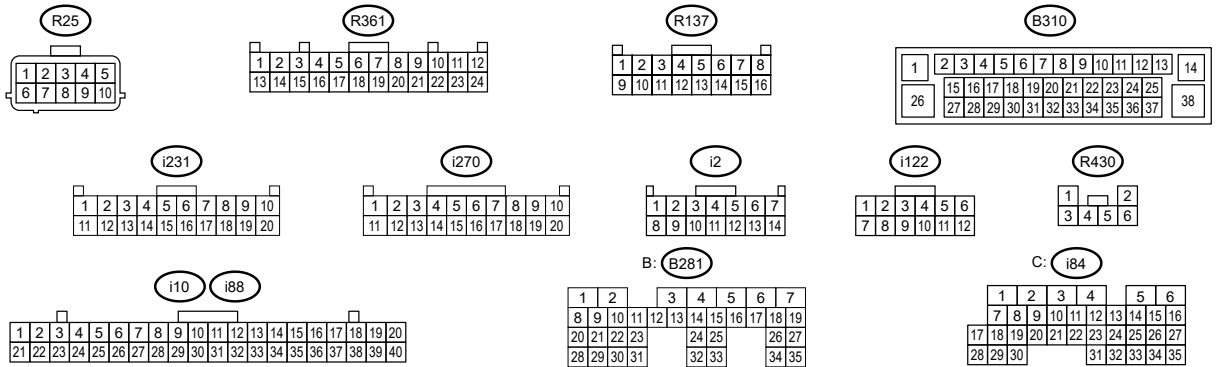
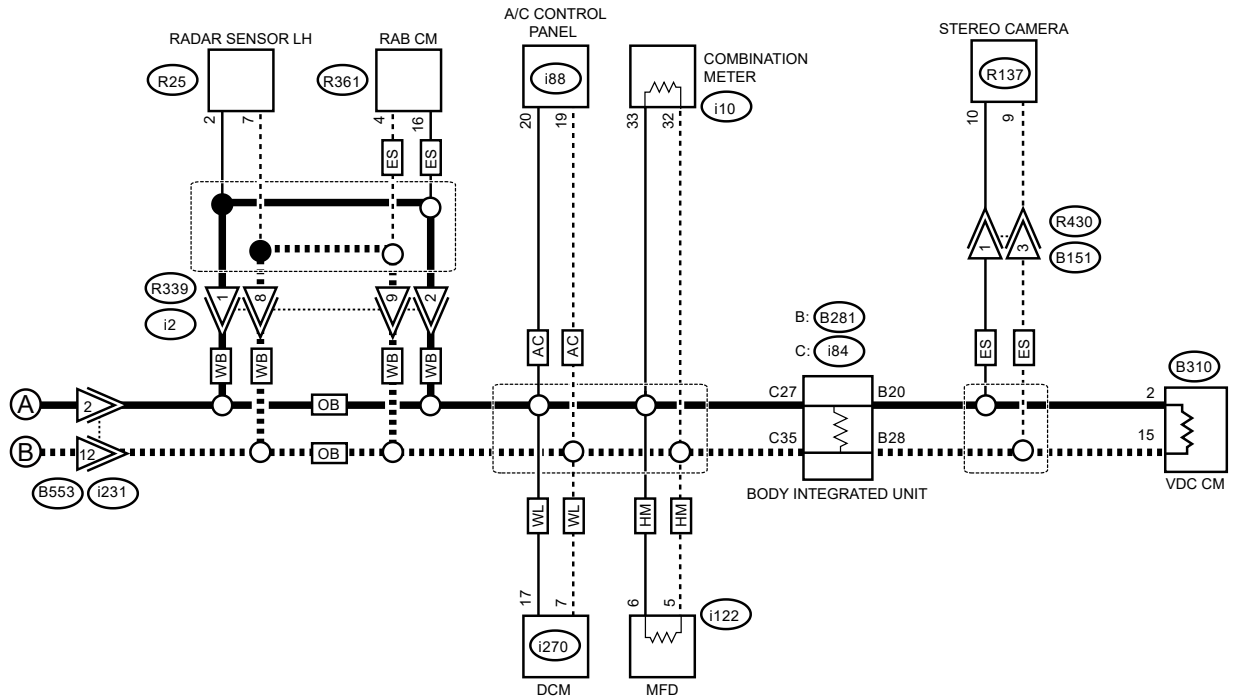
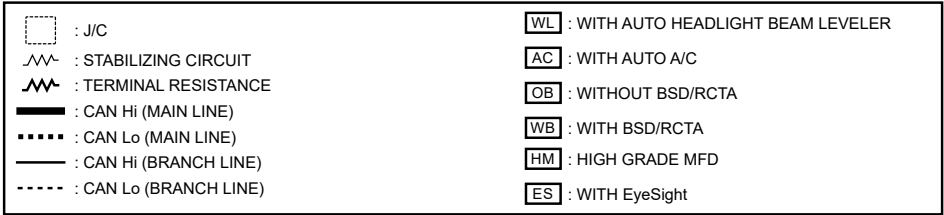
- Non-turbo model





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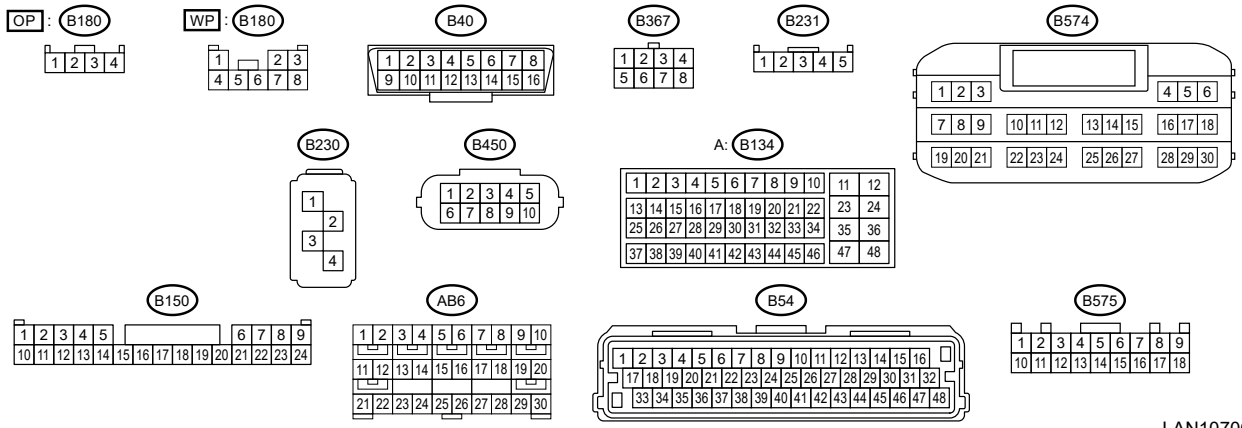
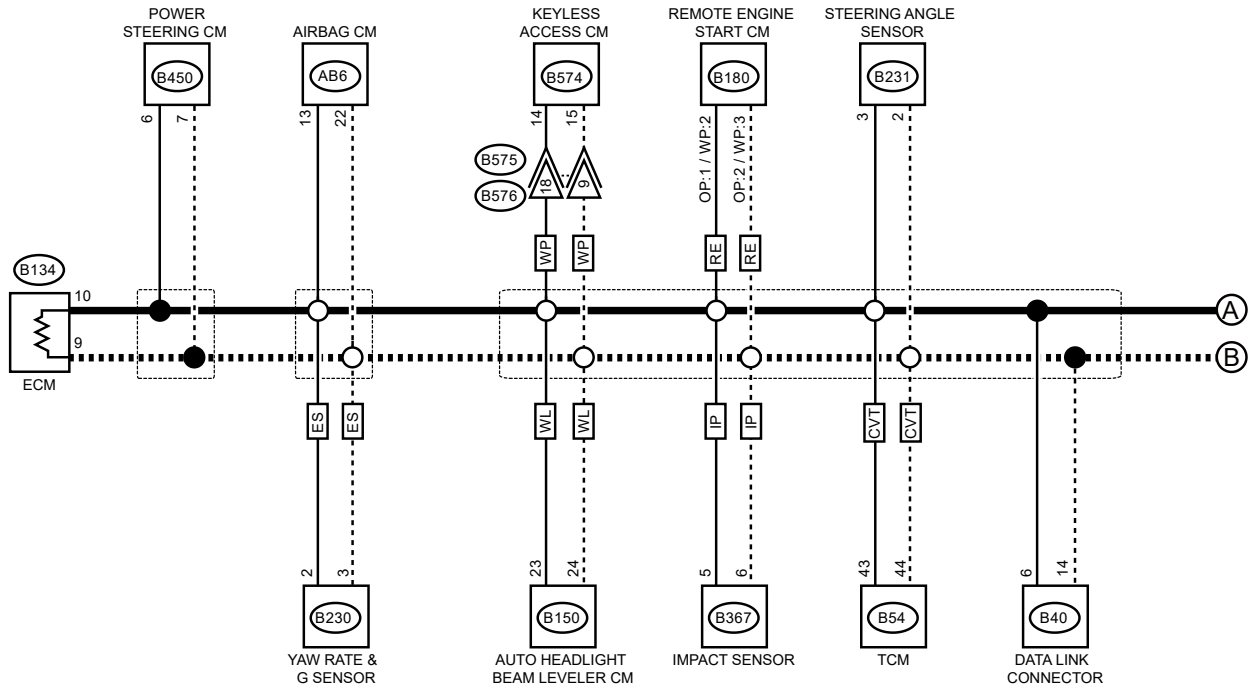
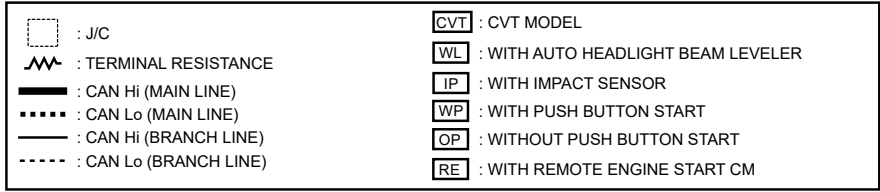




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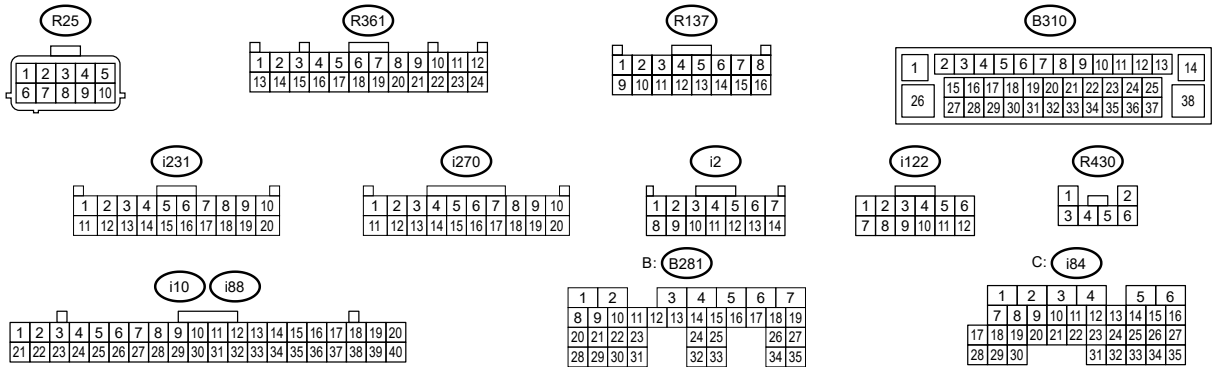
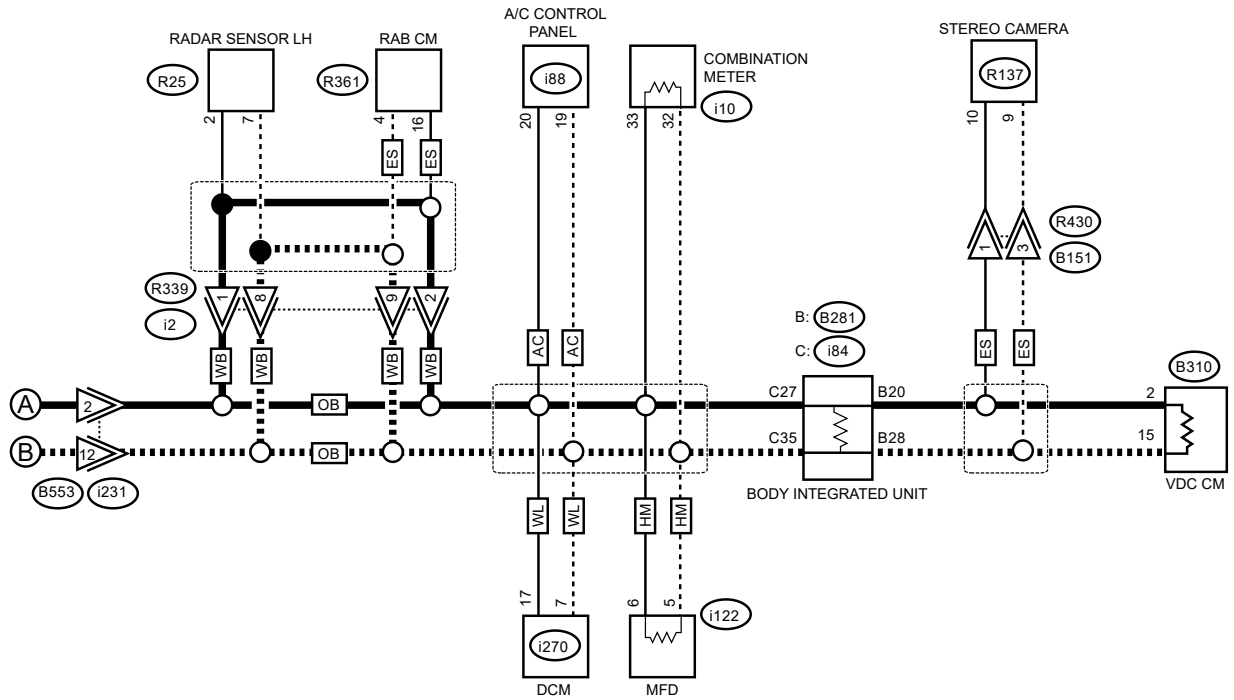
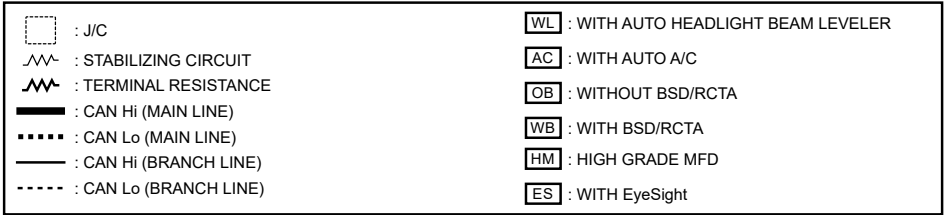
• Turbo model





LAN10706





LAN10705

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

Note:

For test harness, refer to [AIRBAG SYSTEM \(DIAGNOSTICS\)](#). [Ref. to AIRBAG\(DIAGNOSTICS\)>General Description>PREPARATION TOOL.](#)

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Remove the instrument panel lower cover and column cover, and disconnect the connectors (AB7) and (AB2).

3. Remove the console front panel and disconnect the connector (AB9).
4. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
5. Connect the connector (1AH) in the test harness AH to the connectors (AB6, AB17, AB18).
6. Connect the connector (2AH) in the test harness AH and the connector (1AG) in the test harness AG.
7. Using the tester, measure the resistance between terminals.

Connector & terminal


(2AG) No. 2 — (4AG) No. 2:

Is the resistance 400 Ω or more?

Yes

Related lines between airbag CM and main wiring harness is open, or main wiring harness is open at two places or more.

No

 [Go to 2.](#)

2. CHECK RELATED LINES.



Using the tester, measure the resistance between terminals.

Connector & terminal

(2AG) No. 2 — (B40) No. 14:


(4AG) No. 2 — (B40) No. 6:

Is the resistance 10 Ω or more?

Yes


Repair or replace the open circuit portion of airbag CM related lines.

No

Check DTC of airbag CM.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

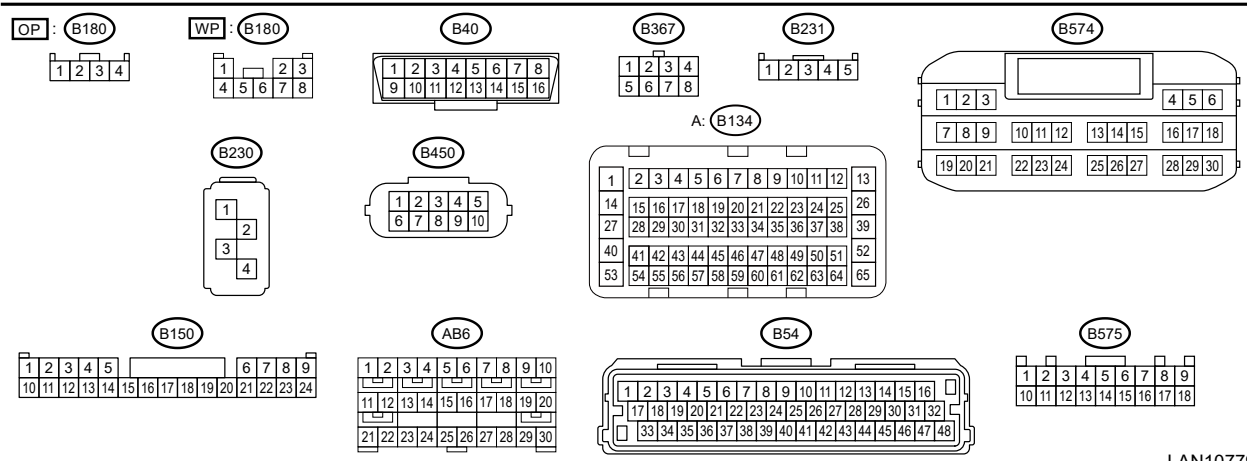
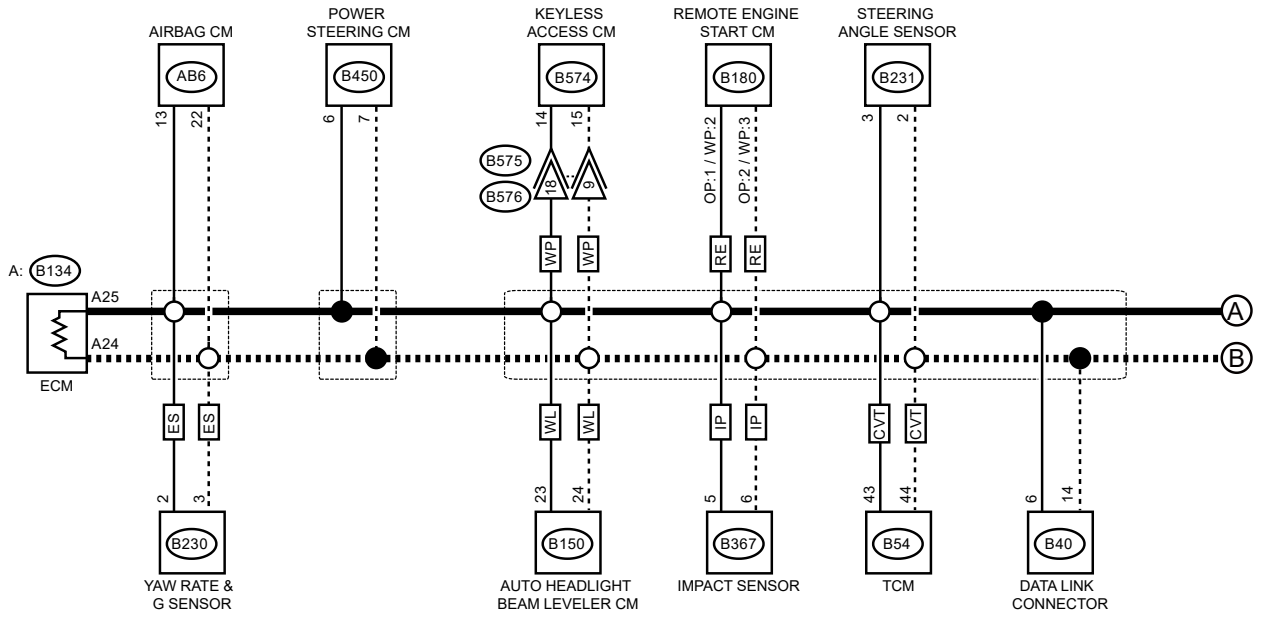
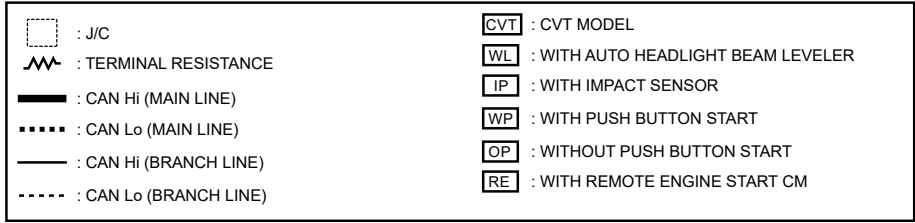
13. RELATED LINES 53 — 61 Ω (KEYLESS ACCESS SYSTEM)

Wiring diagram:

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)

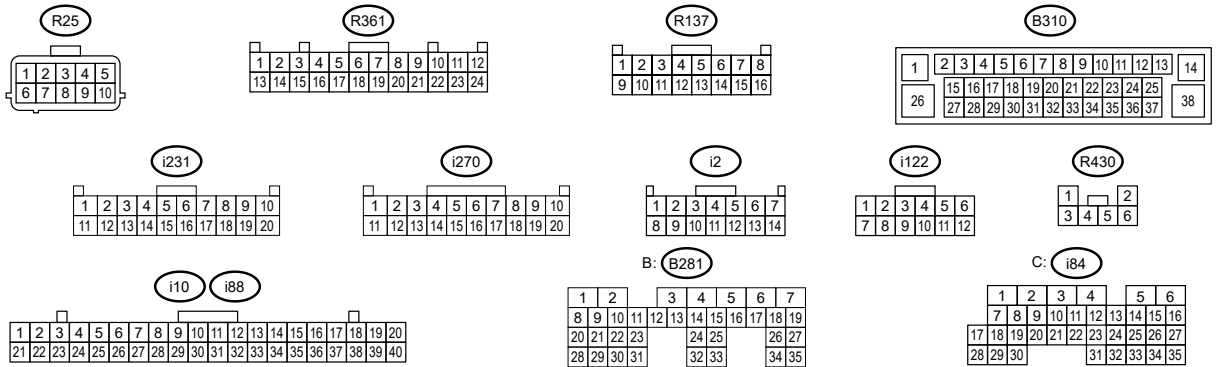
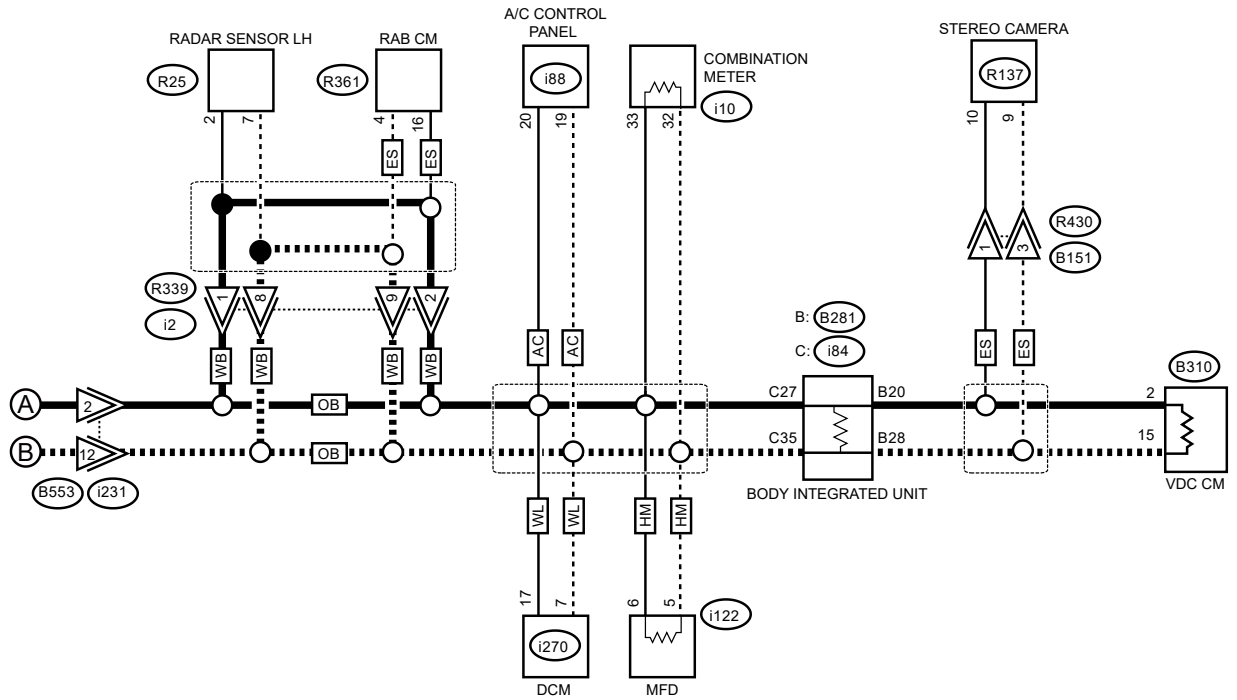
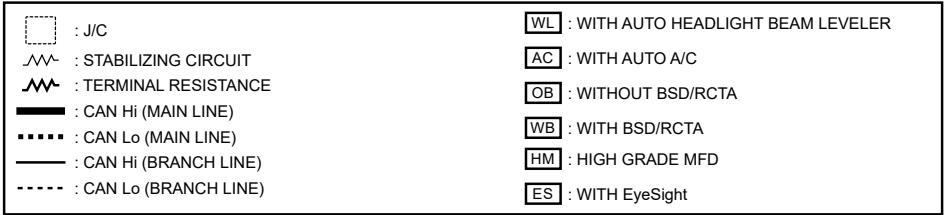
- Non-turbo model





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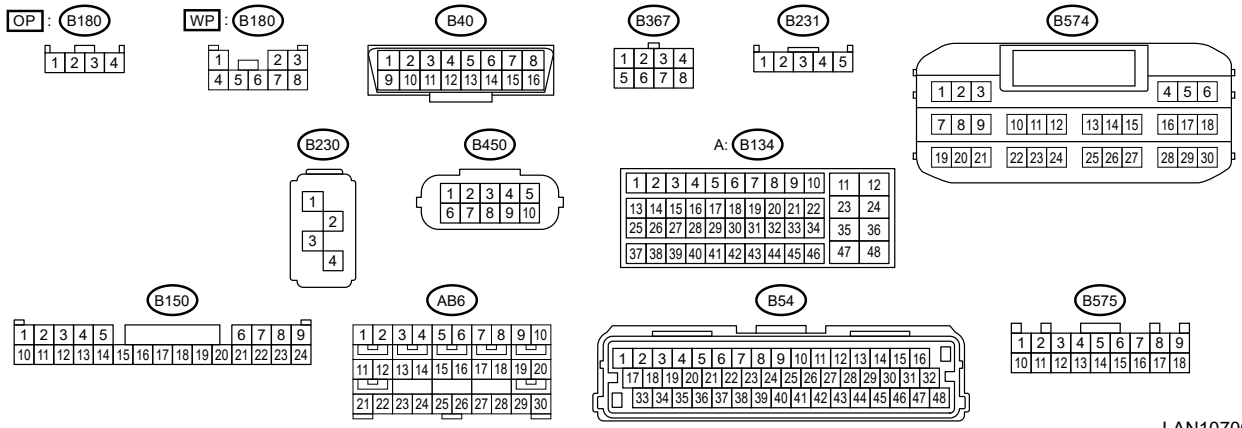
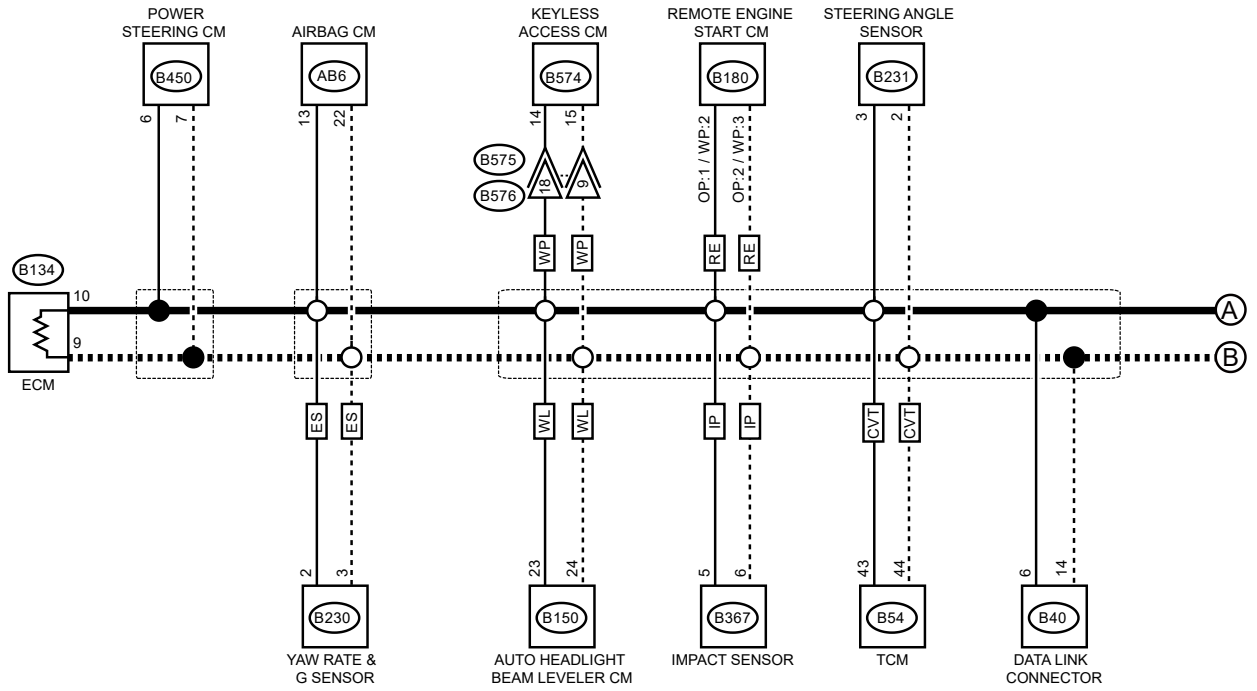
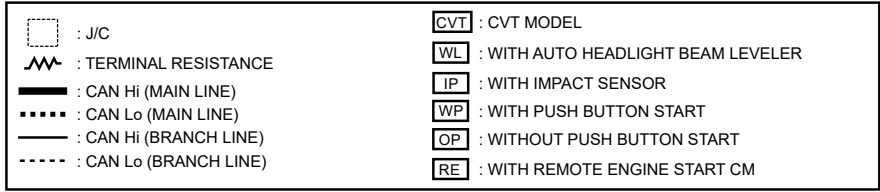




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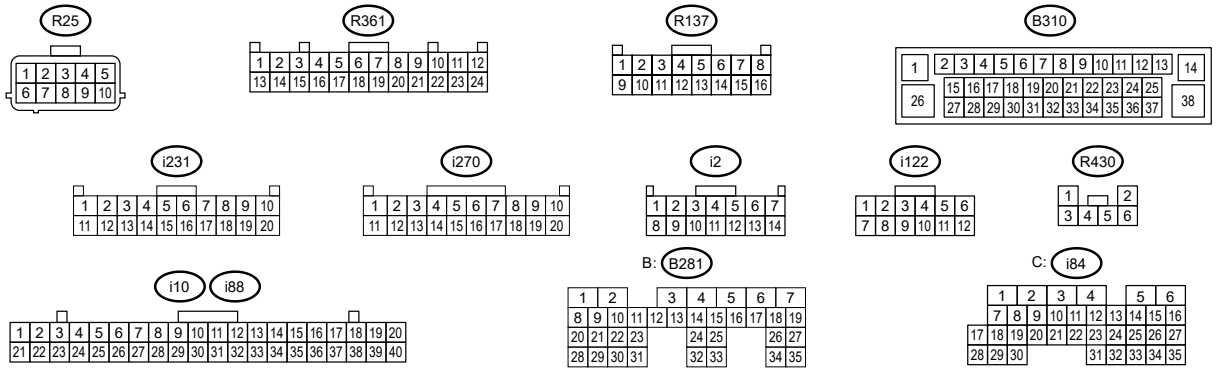
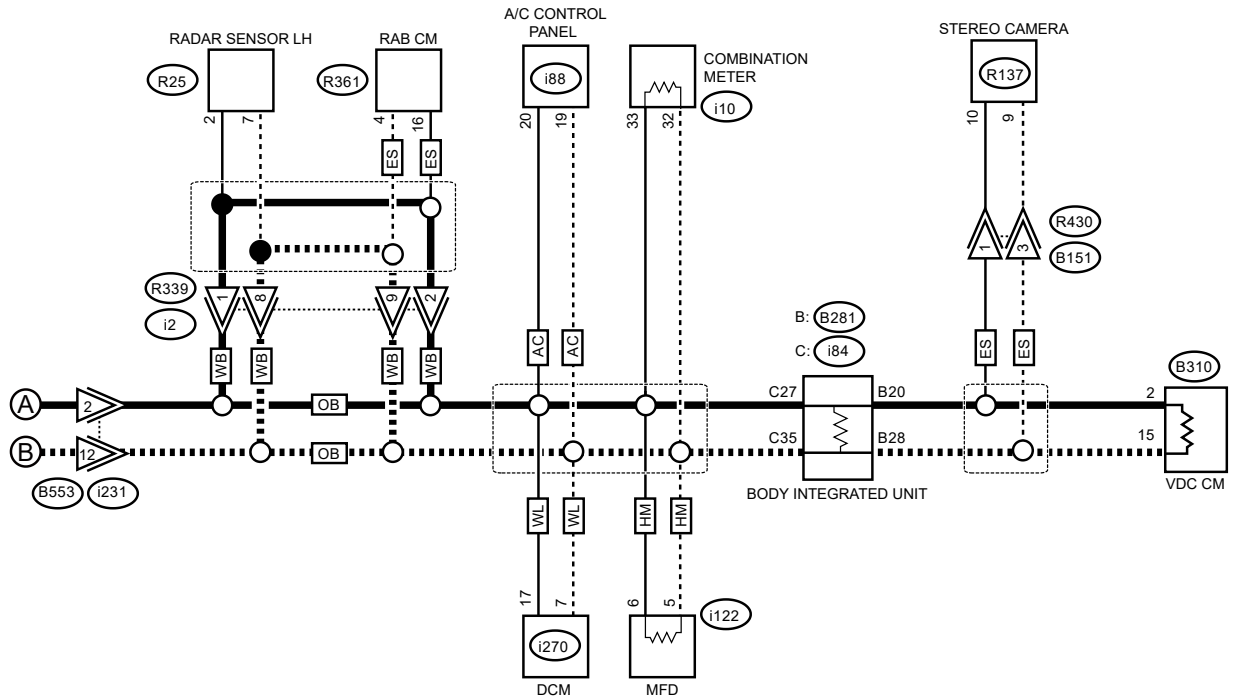
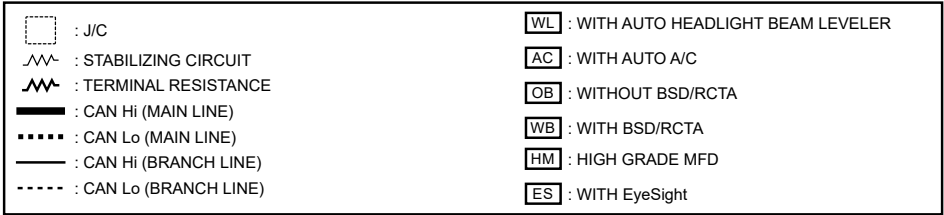
• Turbo model





LAN10706





LAN10705

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the keyless access CM connector.
2. Using the tester, measure the resistance between terminals.

Connector & terminal

(B574) No. 14 — No. 15:

Is the resistance 400 Ω or more?




Related lines between keyless access CM and main wiring harness is open, or main

Yes

wiring harness is open at two places or more.

No

 [Go to 2.](#)

2. CHECK RELATED LINES.

Using the tester, measure the resistance between terminals.

Connector & terminal

(B574) No. 15 — (B40) No. 14:


(B574) No. 14 — (B40) No. 6:

Is the resistance 10 Ω or more?

Yes

Repair or replace the open circuit of keyless access CM related lines.

No

Check DTC of keyless access CM.  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

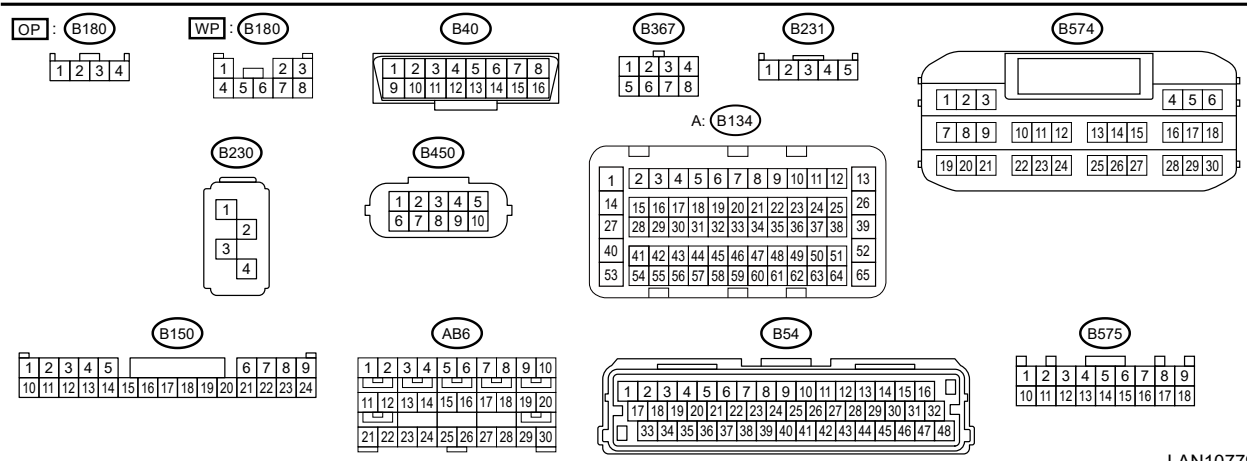
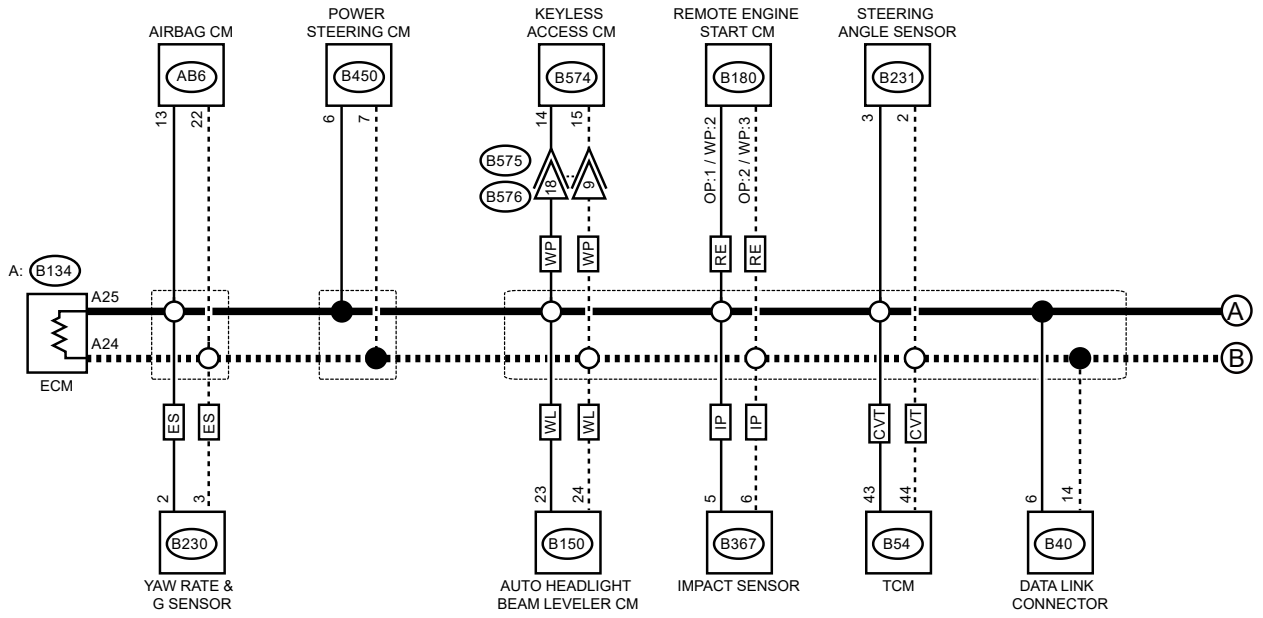
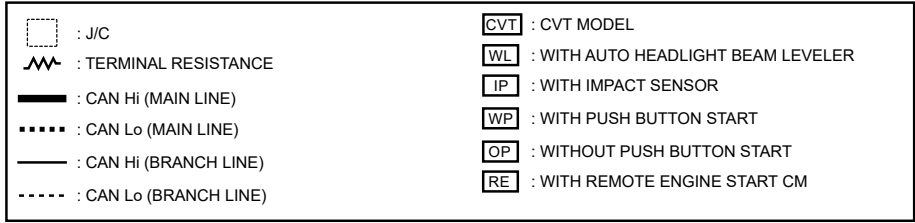
14. RELATED LINES 53 — 61 Ω (STEREO CAMERA)

Wiring diagram:

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)

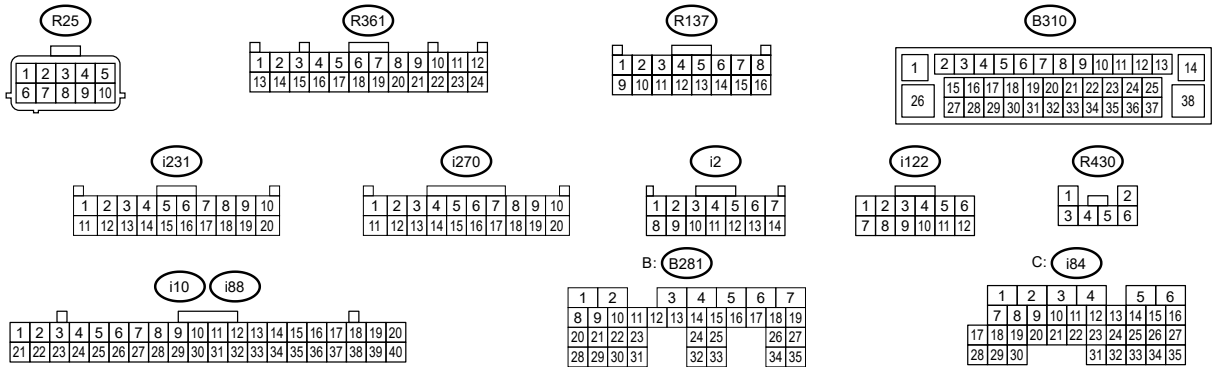
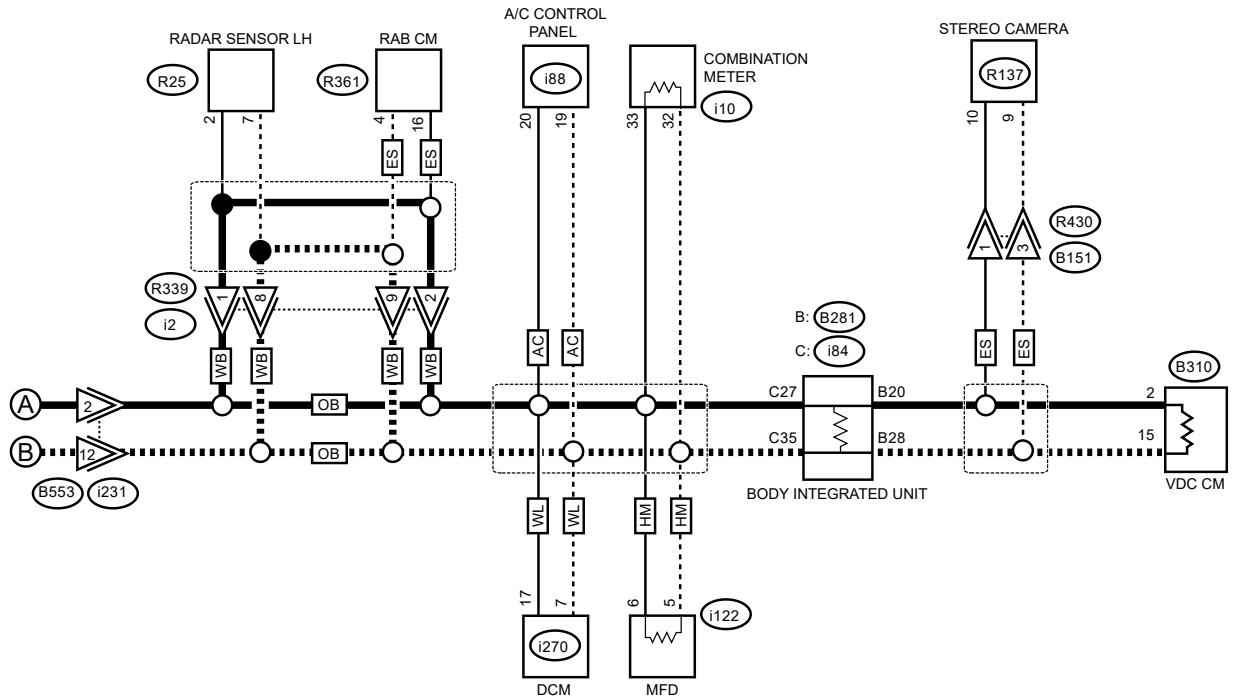
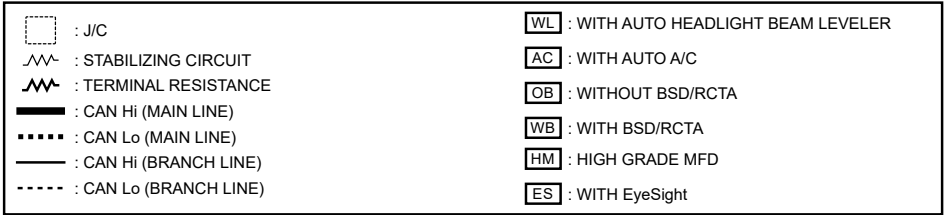
- Non-turbo model





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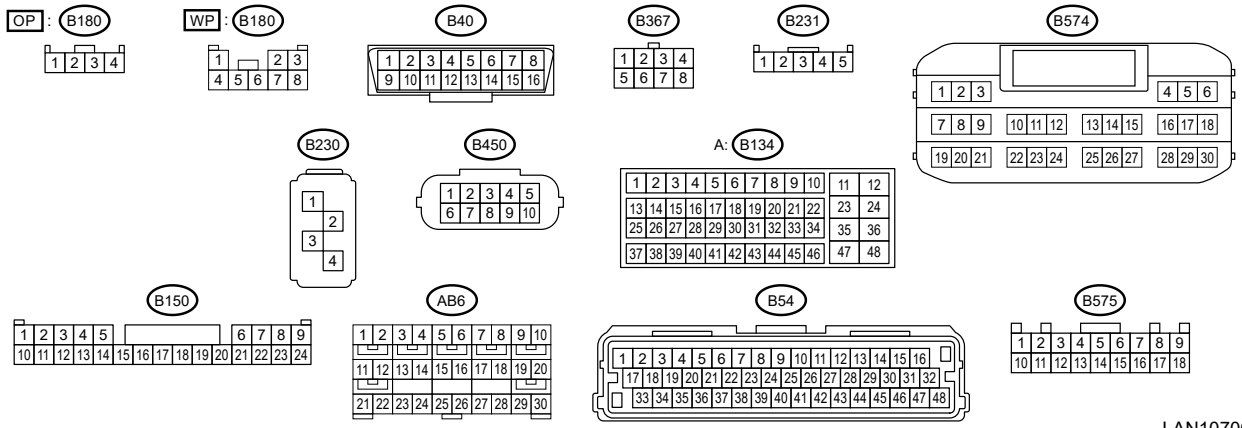
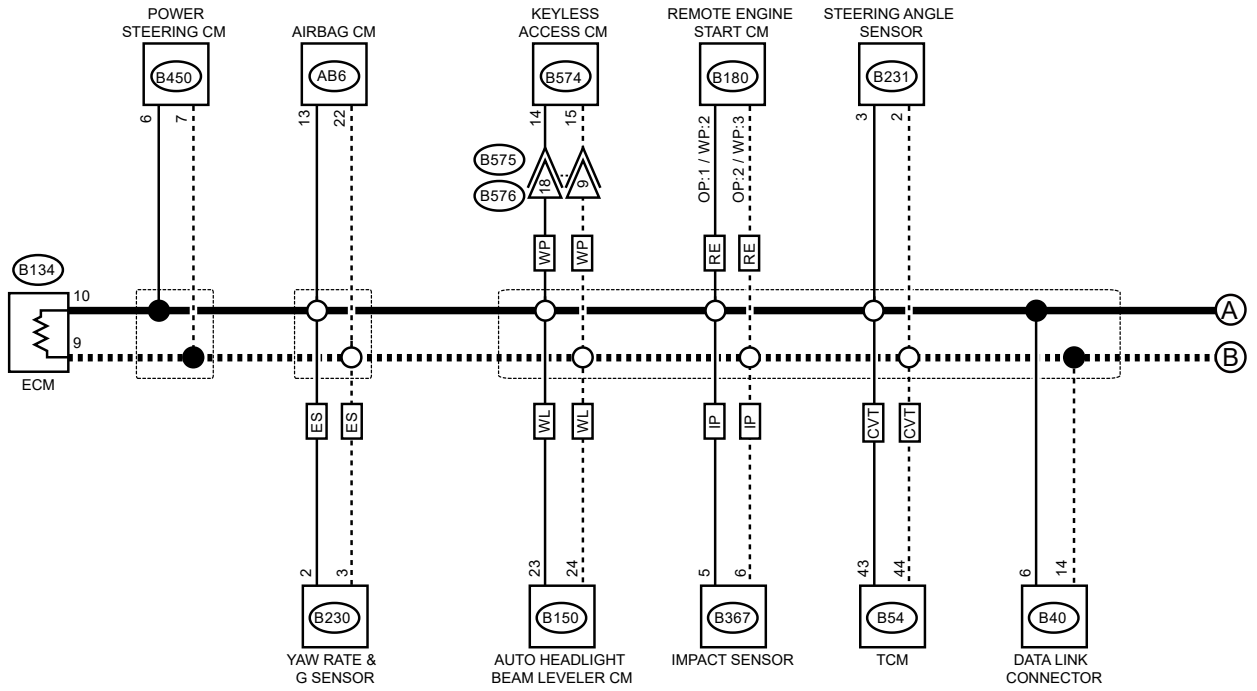
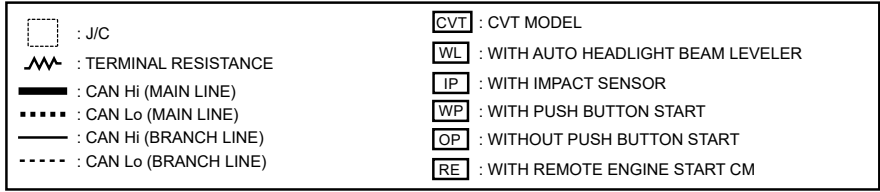




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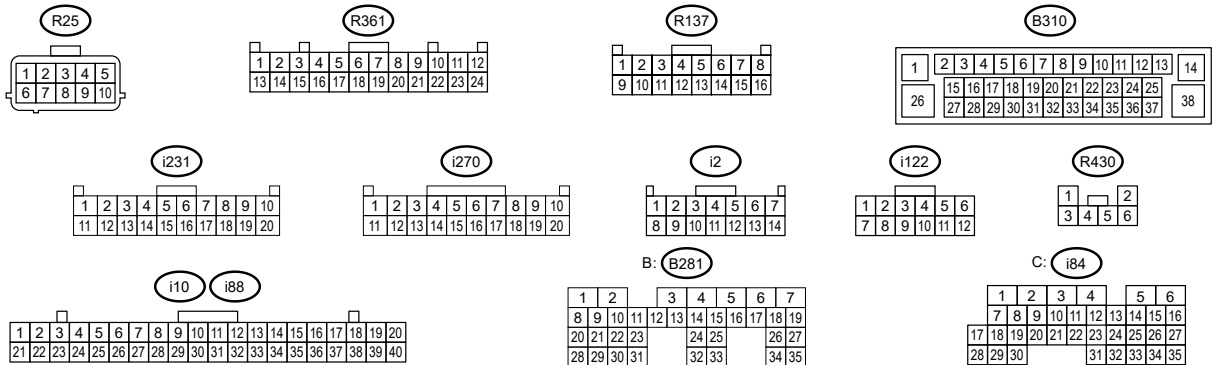
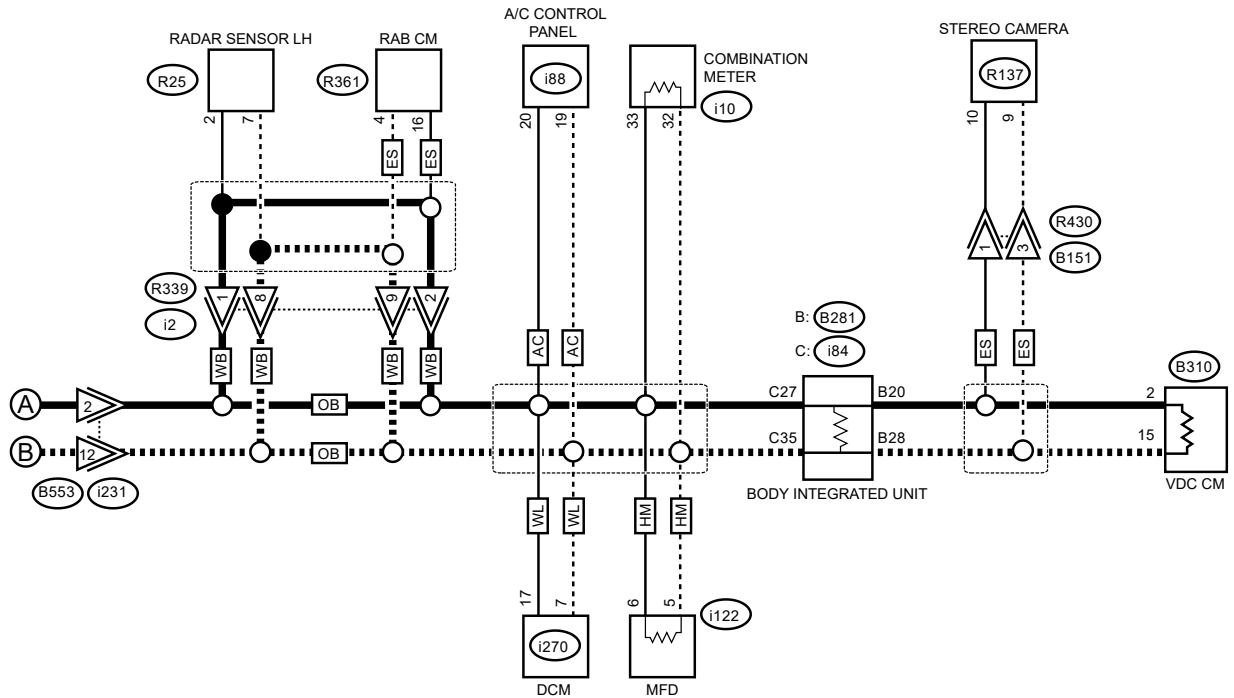
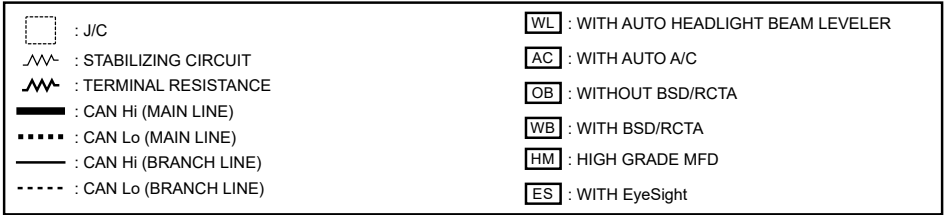
• Turbo model





LAN10706





LAN10705

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the stereo camera connector.
2. Using the tester, measure the resistance between terminals.

Connector & terminal

(R137) No. 10 — No. 9:

Is the resistance 400 Ω or more?




Related lines between stereo camera and main wiring harness is open, or main

Yes

wiring harness is open at two places or more.

No

 [Go to 2.](#)

2. CHECK RELATED LINES.

Using the tester, measure the resistance between terminals.

Connector & terminal

(R137) No. 9 — (B40) No. 14:


(R137) No. 10 — (B40) No. 6:

Is the resistance 10 Ω or more?

Yes


Repair or replace the open circuit of stereo camera related lines.

No

Check DTC of stereo camera.  [Ref. to EyeSight \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

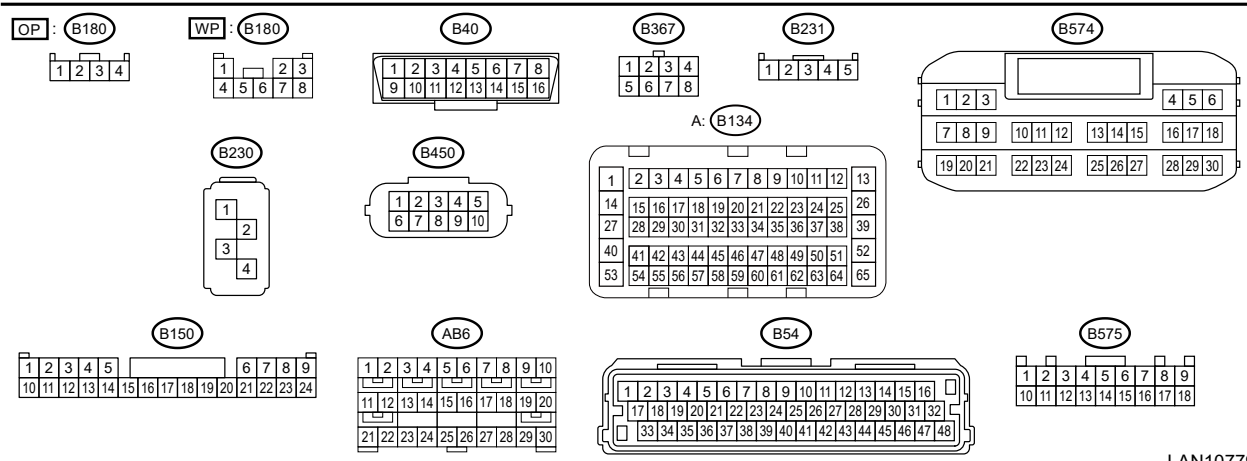
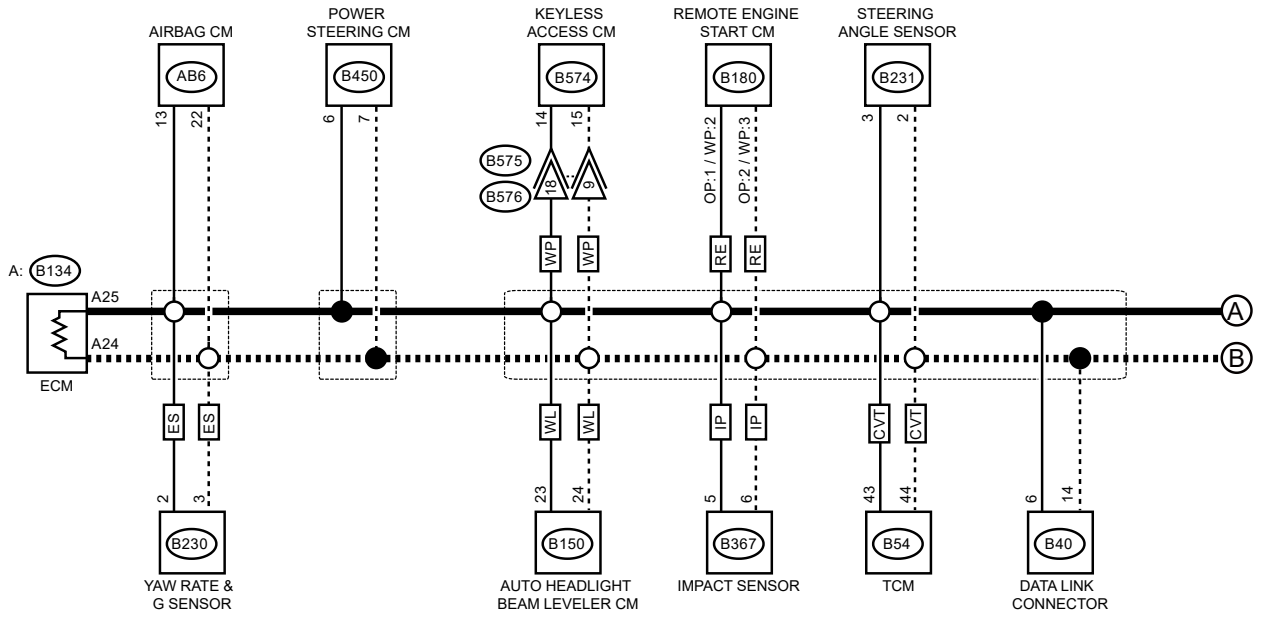
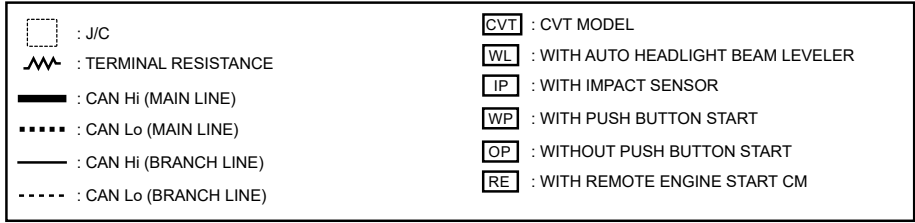
15. RELATED LINES 53 — 61 Ω (REMOTE ENGINE STARTER)

Wiring diagram:

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)

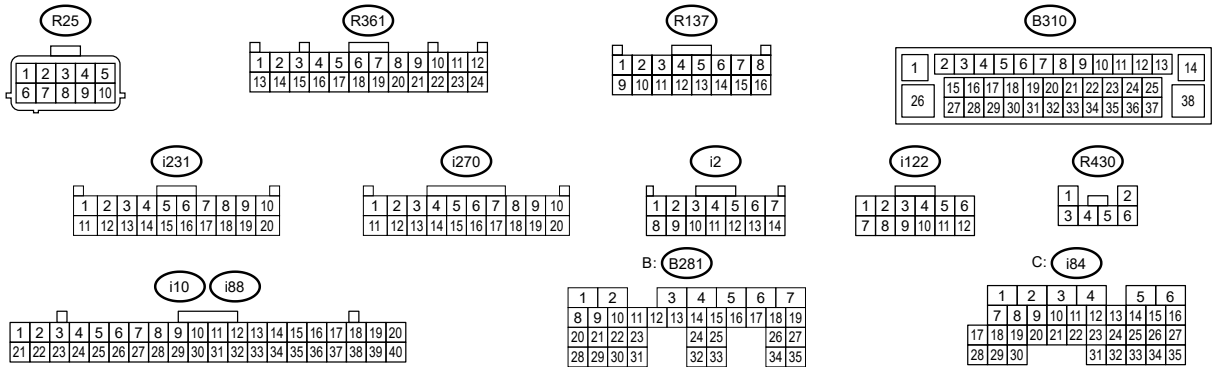
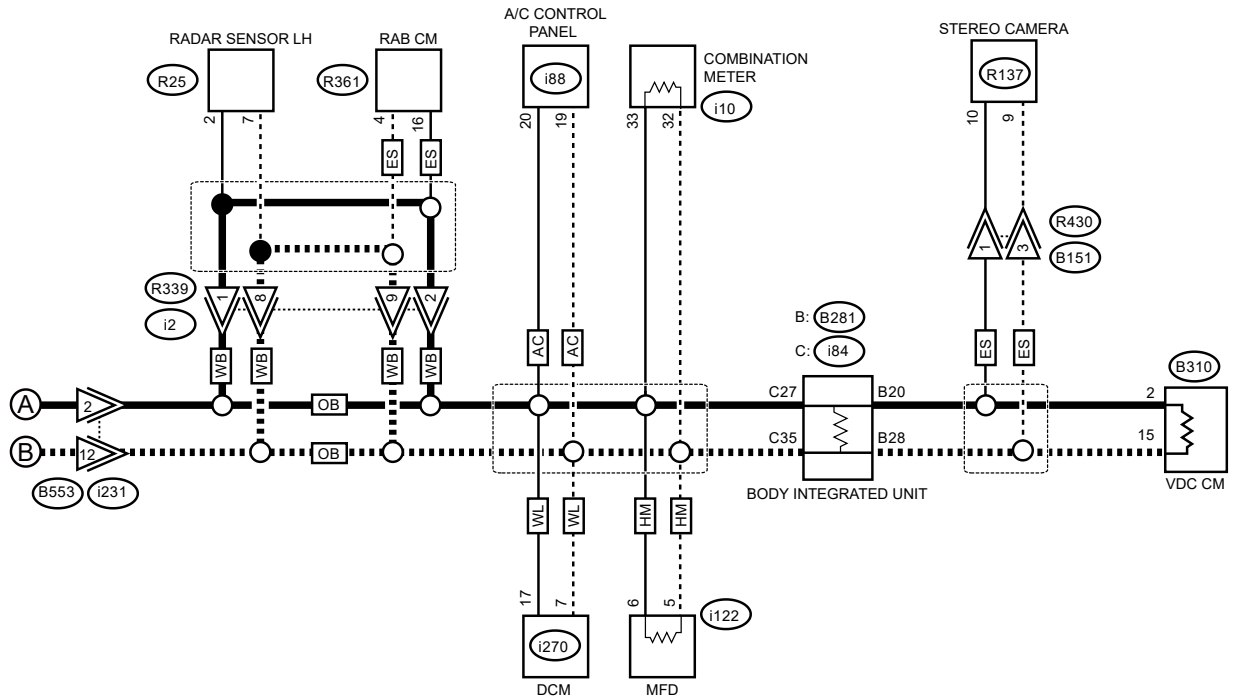
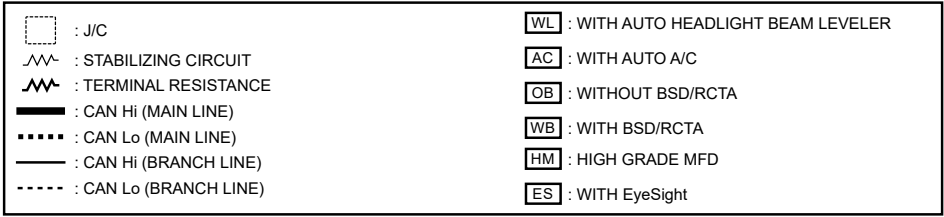
- Non-turbo model





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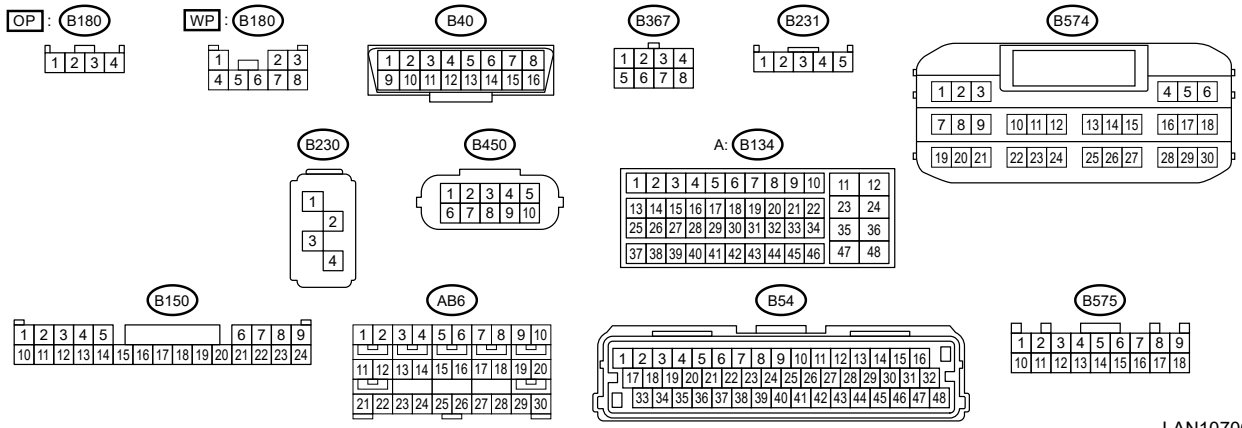
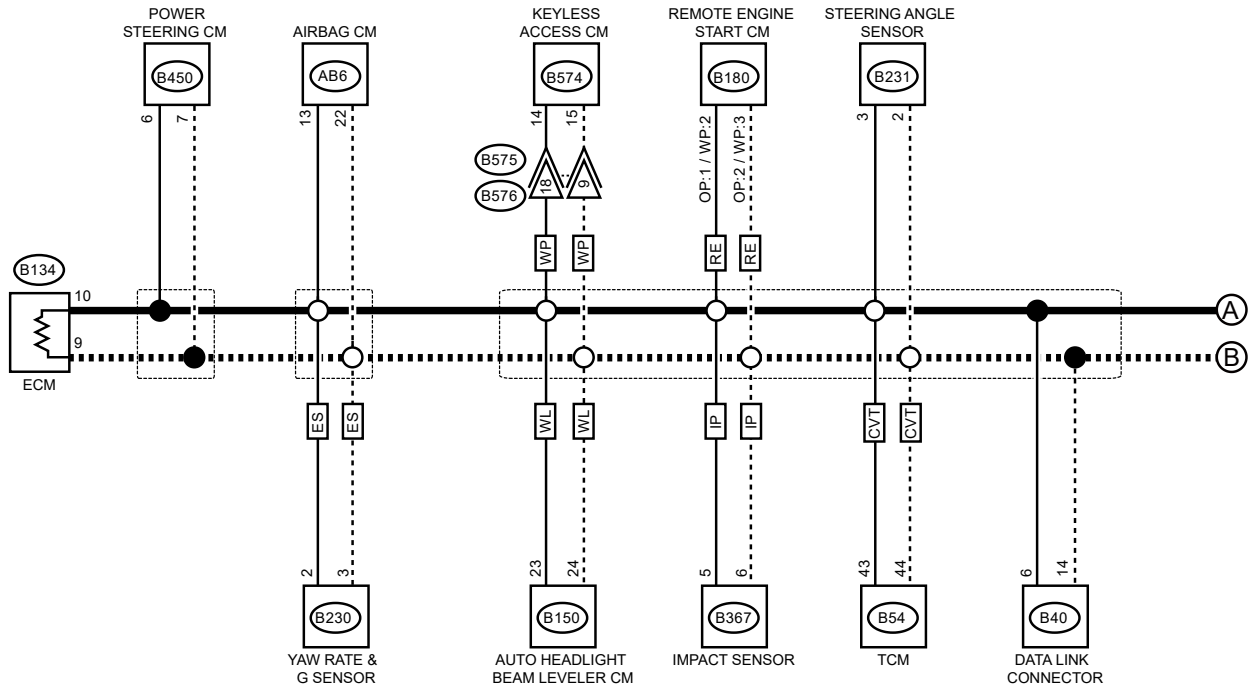
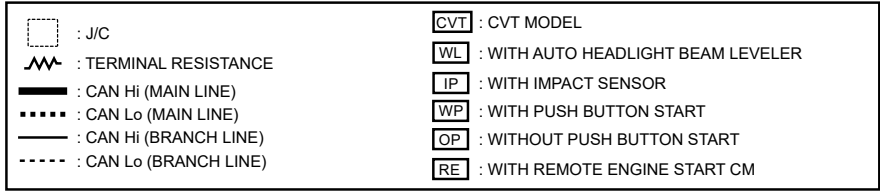




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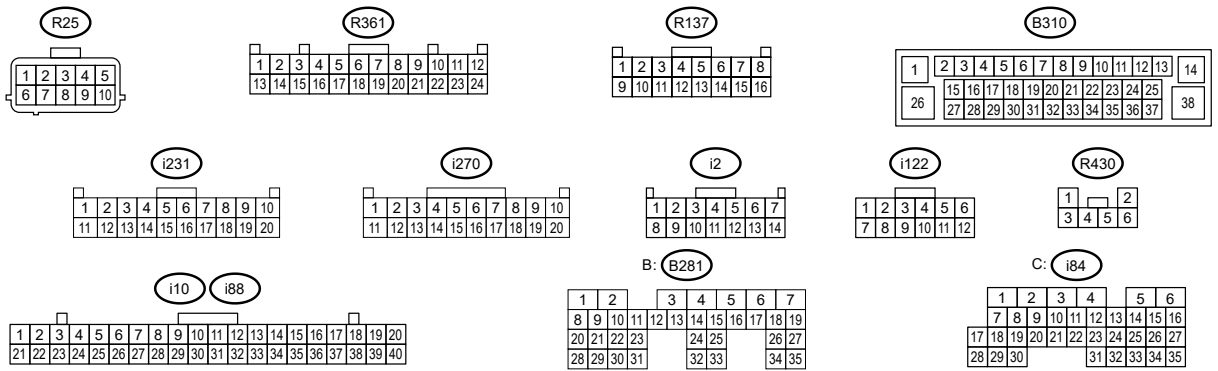
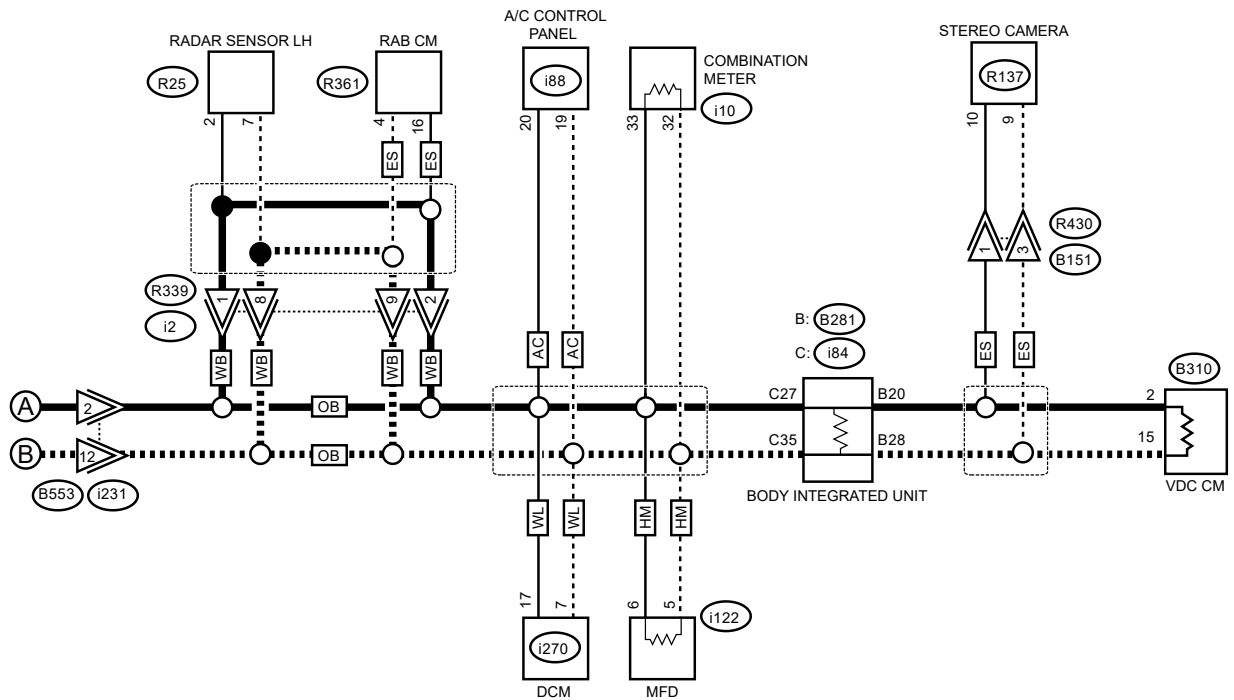
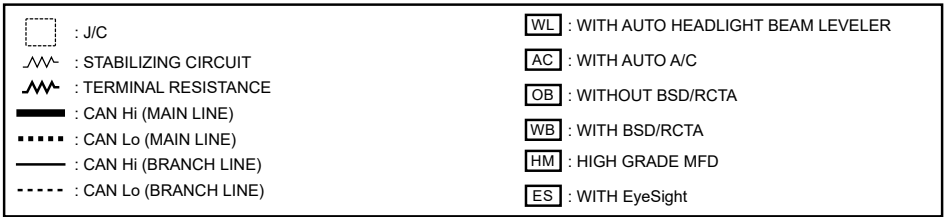
• Turbo model





LAN10706





LAN10705

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the remote engine start CM connector.
2. Using the tester, measure the resistance between terminals.

Connector & terminal

Without push button start

(B180) No. 1 — (B180) No. 2:

With push button start

(B180) No. 2 — (B180) No. 3:

Is the resistance 400 Ω or more?

Yes

Related lines between remote engine start CM and main wiring harness is open, or main wiring harness is open at two places or more.

No

 [Go to 2.](#)

2. CHECK RELATED LINES.

Using the tester, measure the resistance between terminals.

Connector & terminal

Without push button start

(B180) No. 1 — (B40) No. 6:

(B180) No. 2 — (B40) No. 14:

With push button start

(B180) No. 2 — (B40) No. 6:

(B180) No. 3 — (B40) No. 14:

Is the resistance 10 Ω or more?

Yes


Repair or replace the open circuit of remote engine start CM related lines.

No

The communication harness is normal. Check the remote engine starter CM or the mobile key.

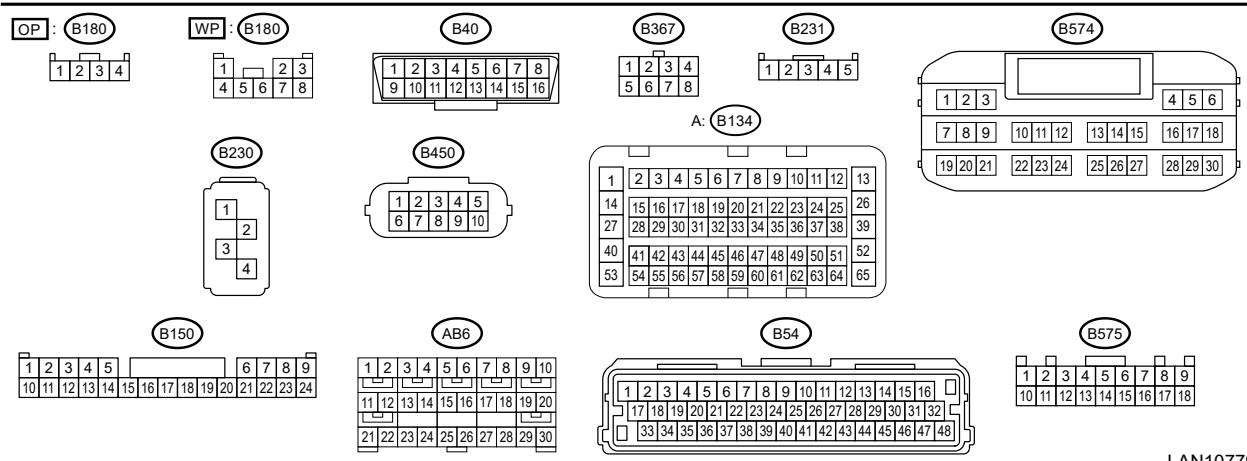
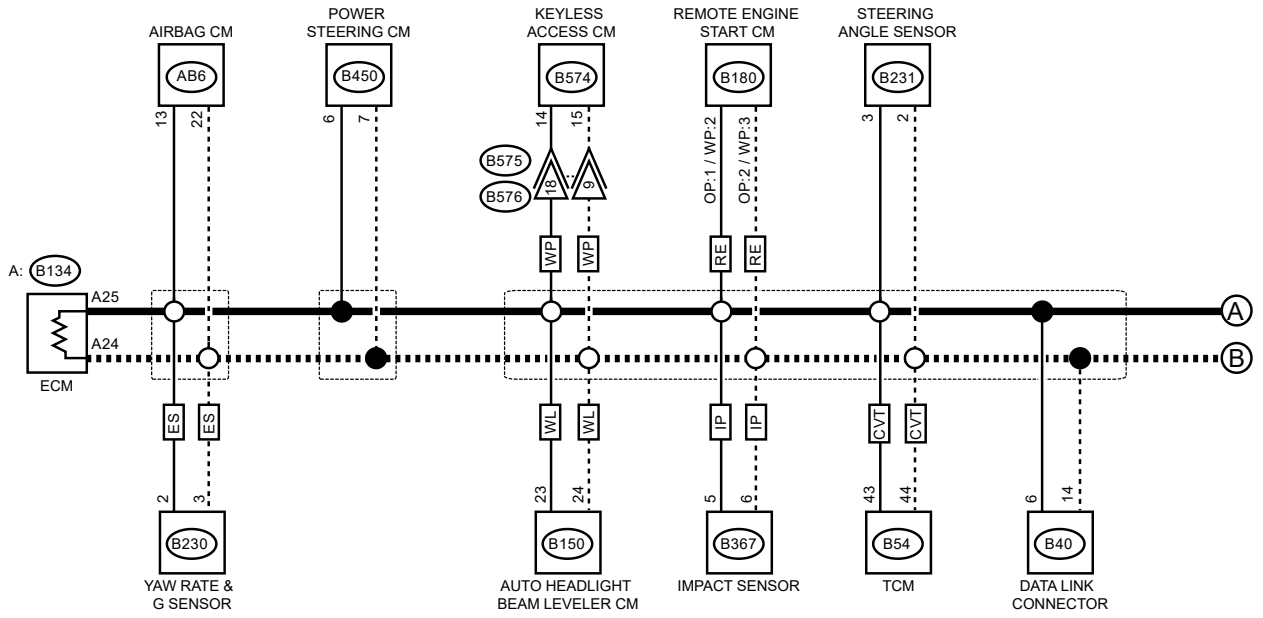
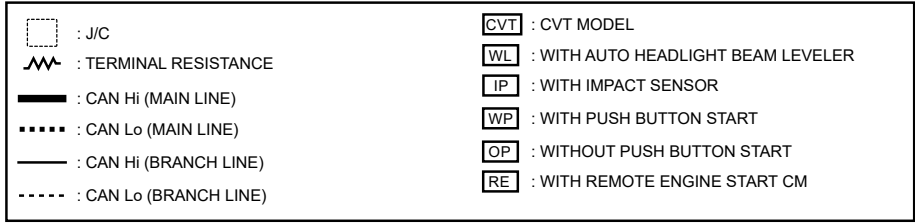
16. RELATED LINES 53 — 61 Ω (HEADLIGHT BEAM LEVELER)

Wiring diagram:

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)

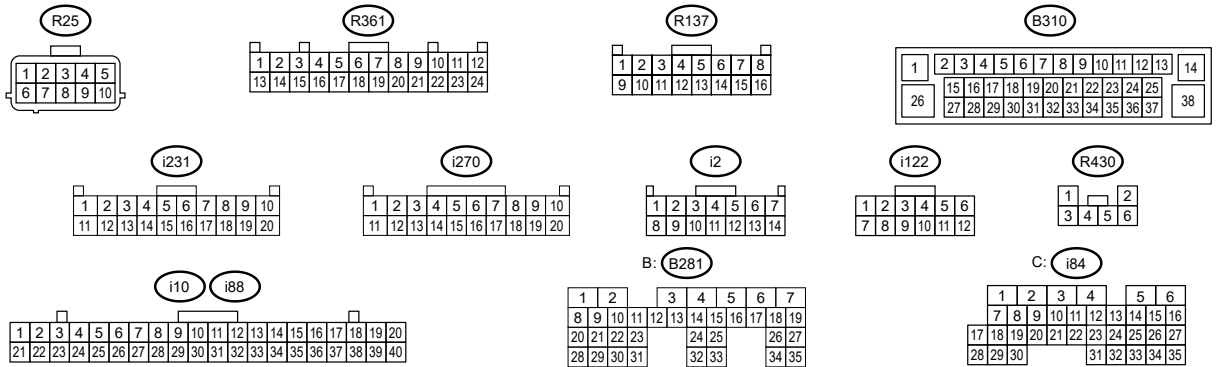
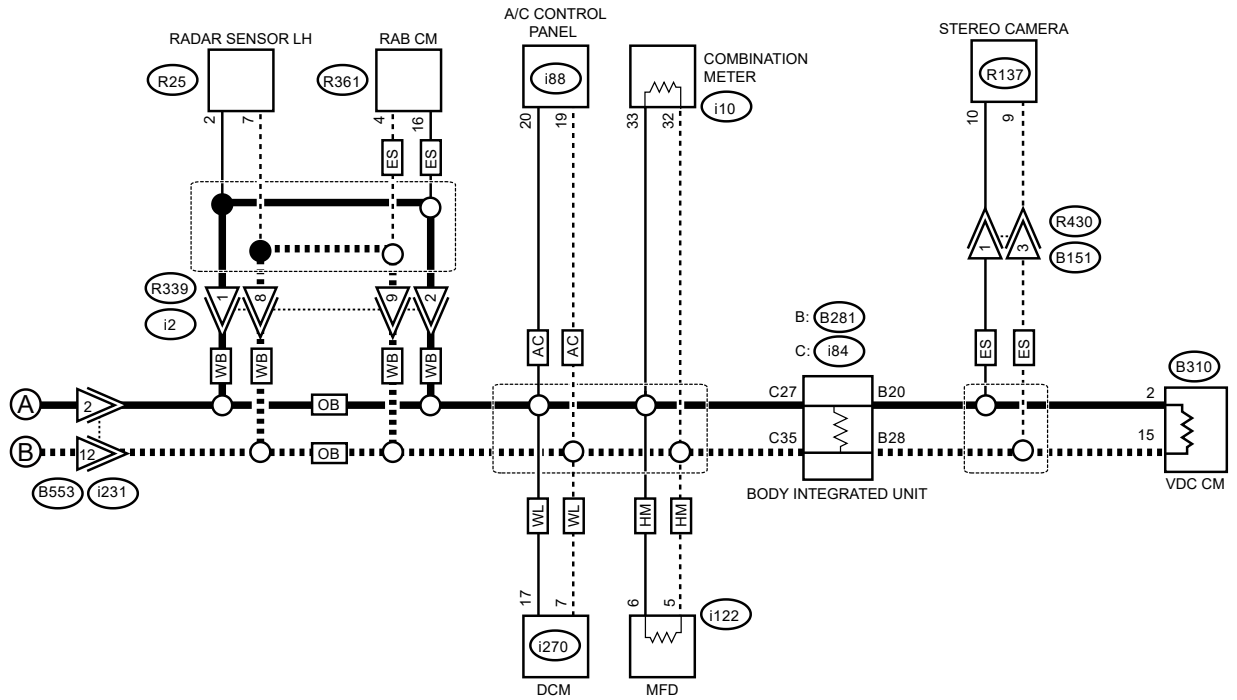
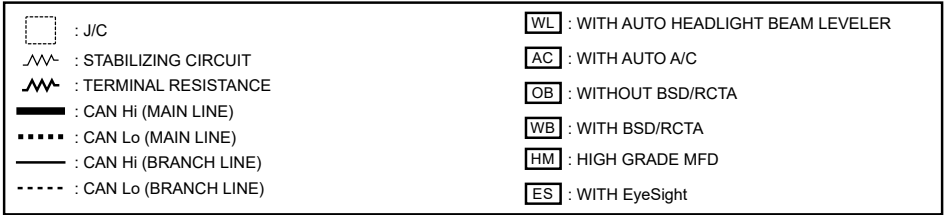
- Non-turbo model





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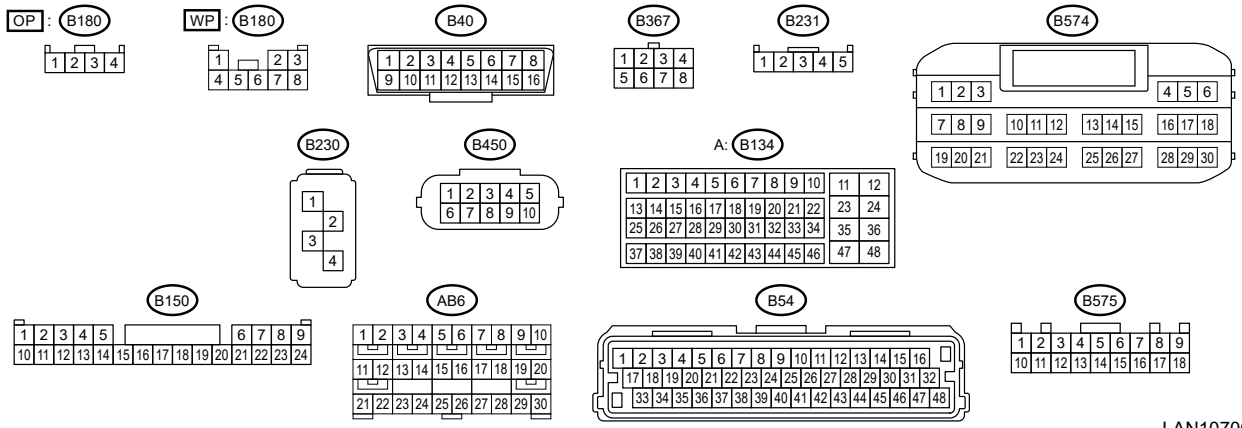
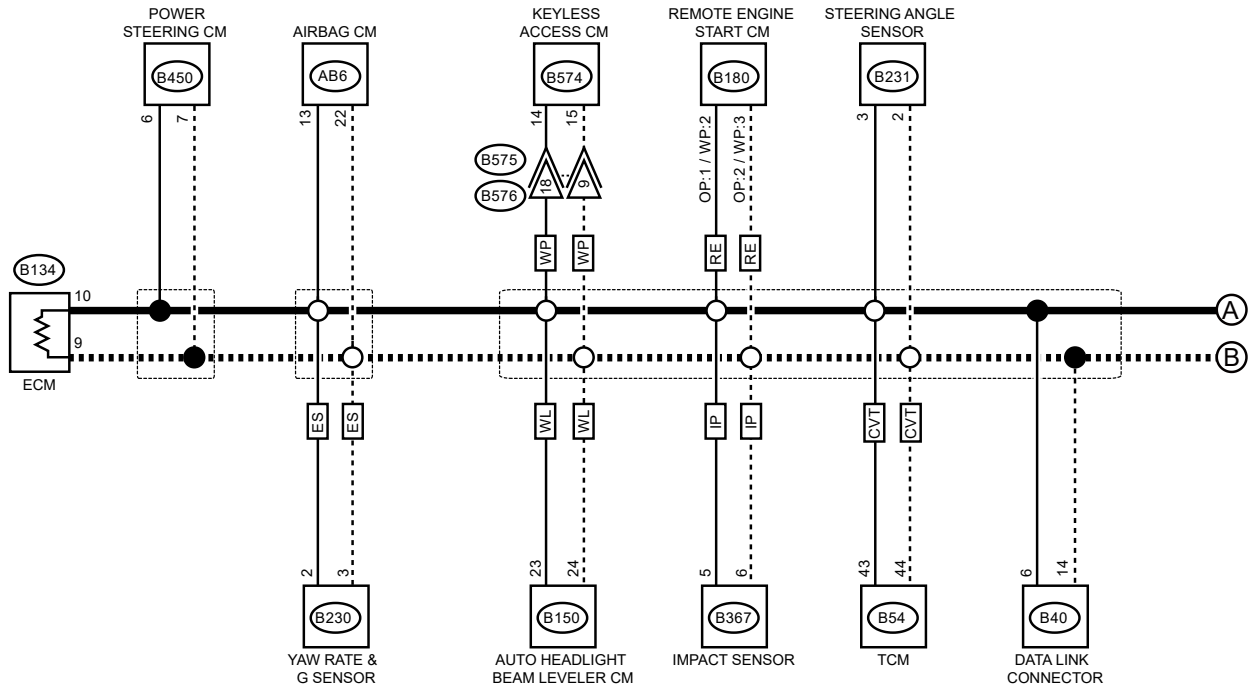
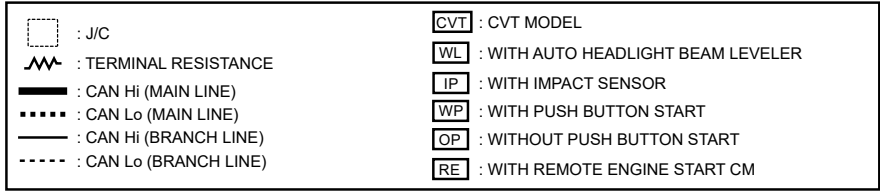




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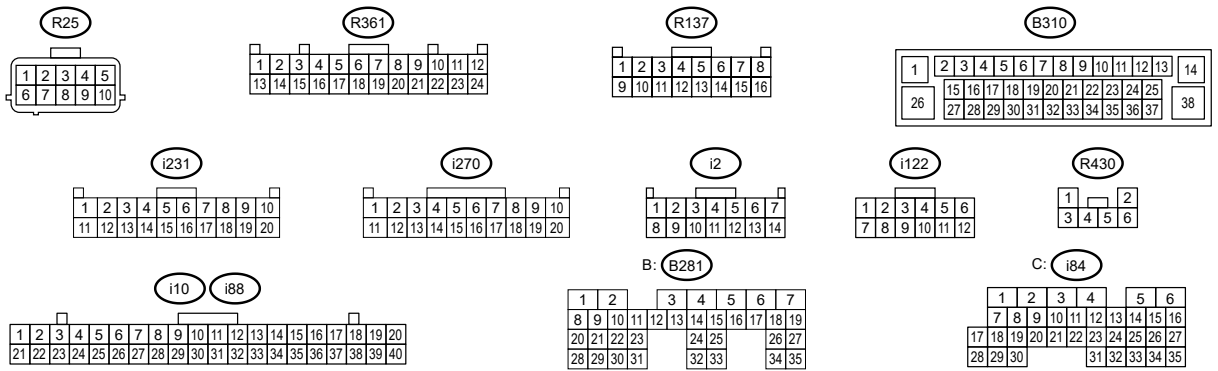
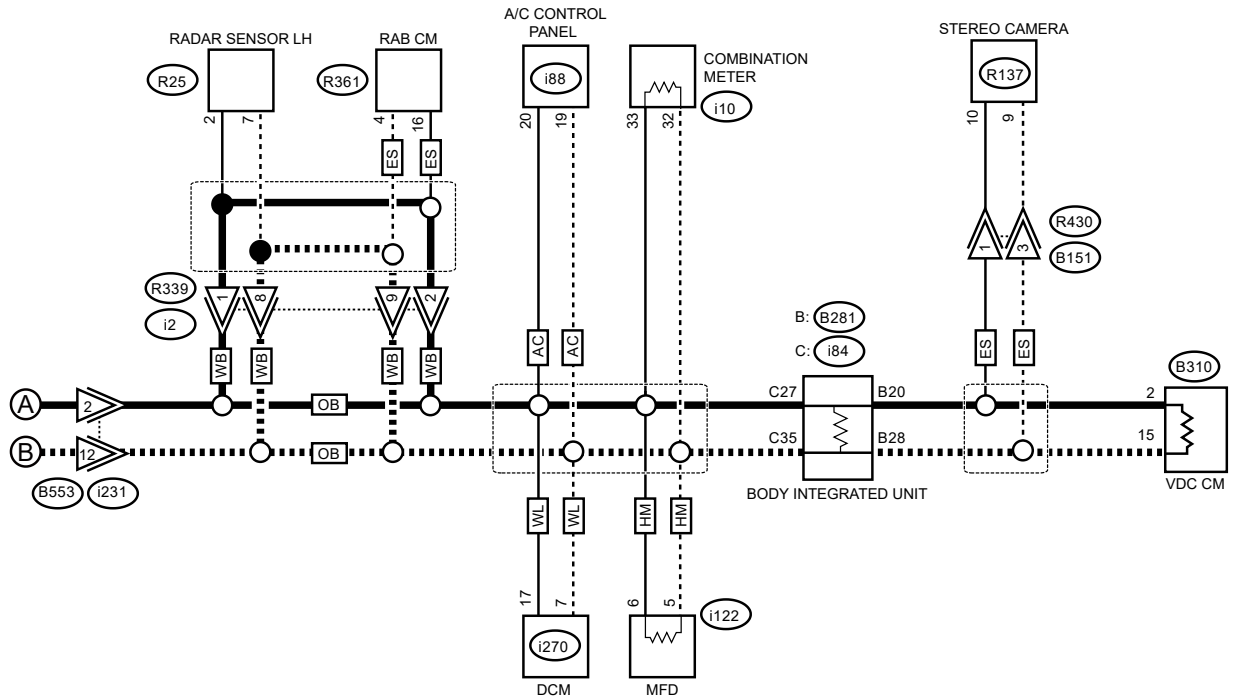
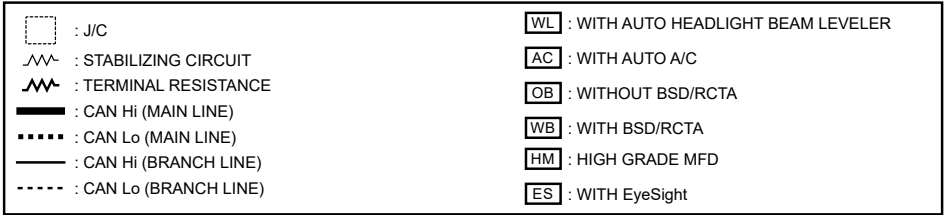
• Turbo model





LAN10706





LAN10705

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the headlight beam leveler CM connector.
2. Using the tester, measure the resistance between terminals.

Connector & terminal

(B150) No. 23 — No. 24:


Is the resistance 400 Ω or more?

 Related lines between headlight beam leveler CM and main wiring harness is open,

Yes

or main wiring harness is open at two places or more.

No

 [Go to 2.](#)

2. CHECK RELATED LINES.

Using the tester, measure the resistance between terminals.

Connector & terminal

(B150) No. 24 — (B40) No. 14:


(B150) No. 23 — (B40) No. 6:

Is the resistance 10 Ω or more?

Yes


Repair or replace the open circuit portion of headlight beam leveler CM related lines.

No

Check DTC of headlight beam leveler system.  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

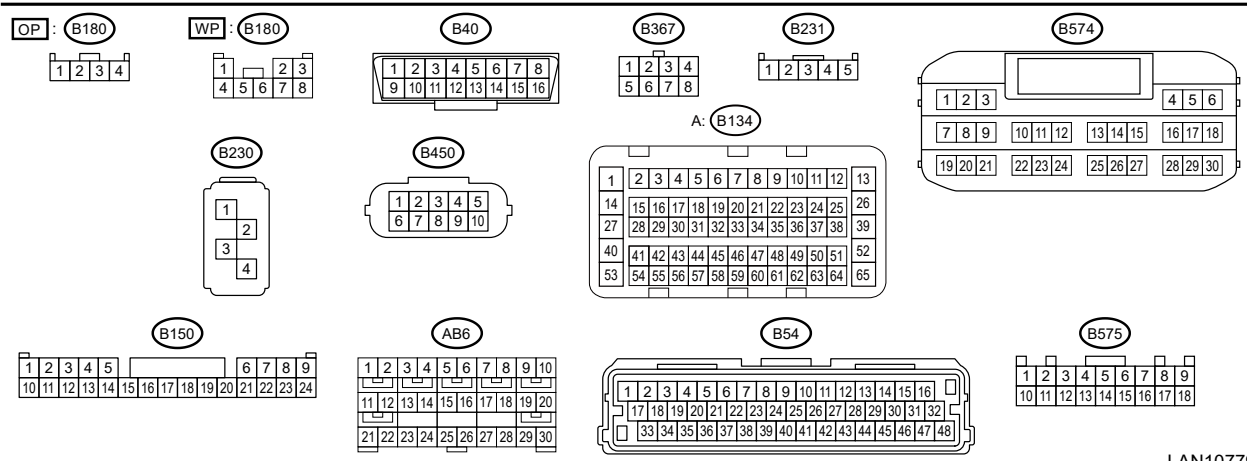
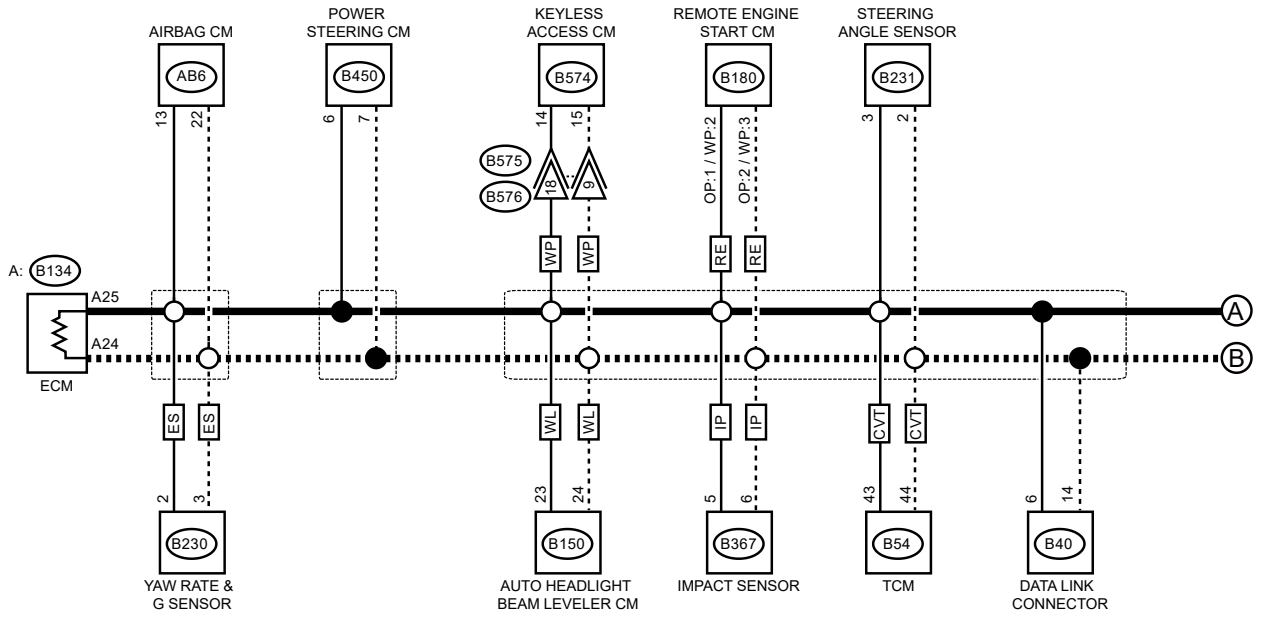
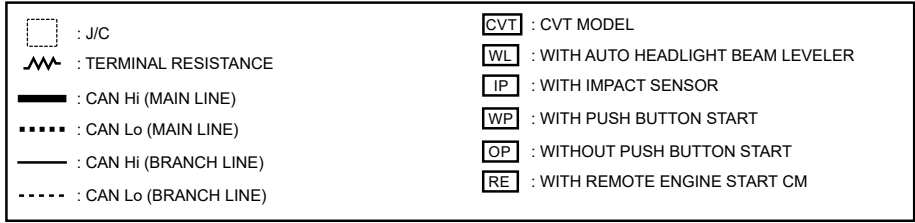
17. RELATED LINES 53 — 61 Ω (IMPACT SENSOR SYSTEM)

Wiring diagram:

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)

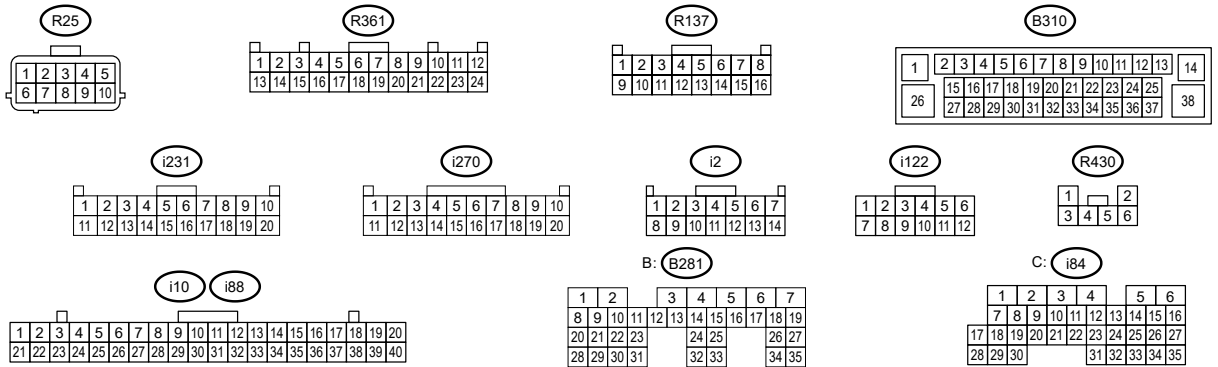
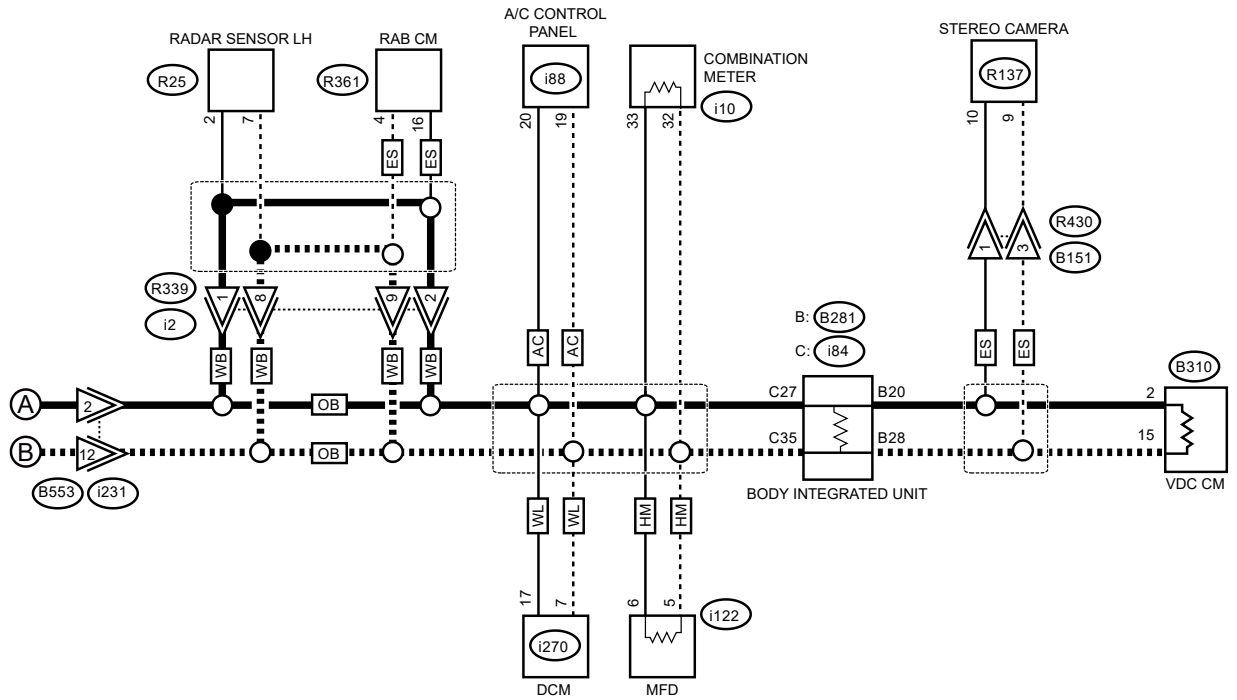
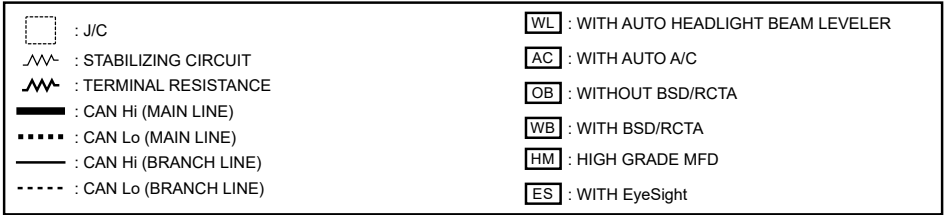
- Non-turbo model





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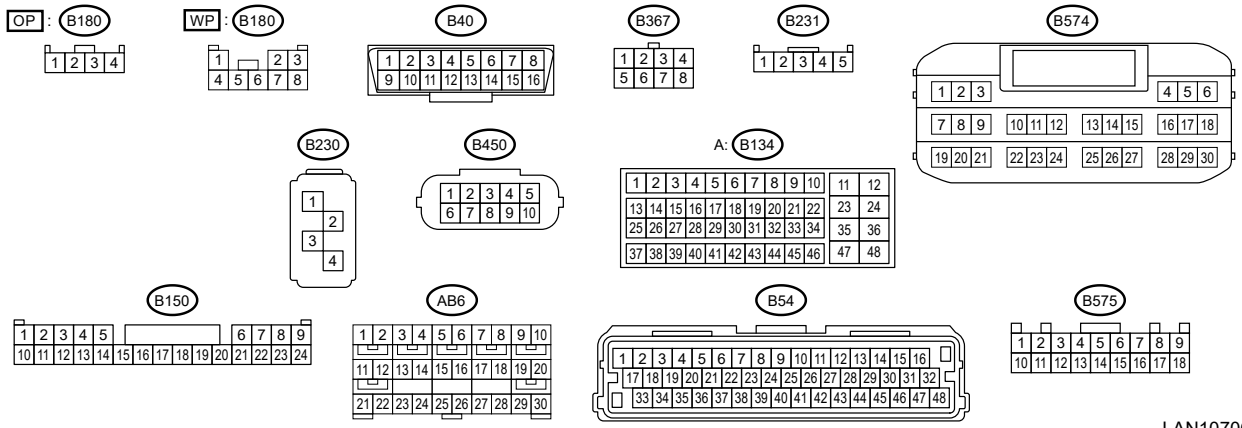
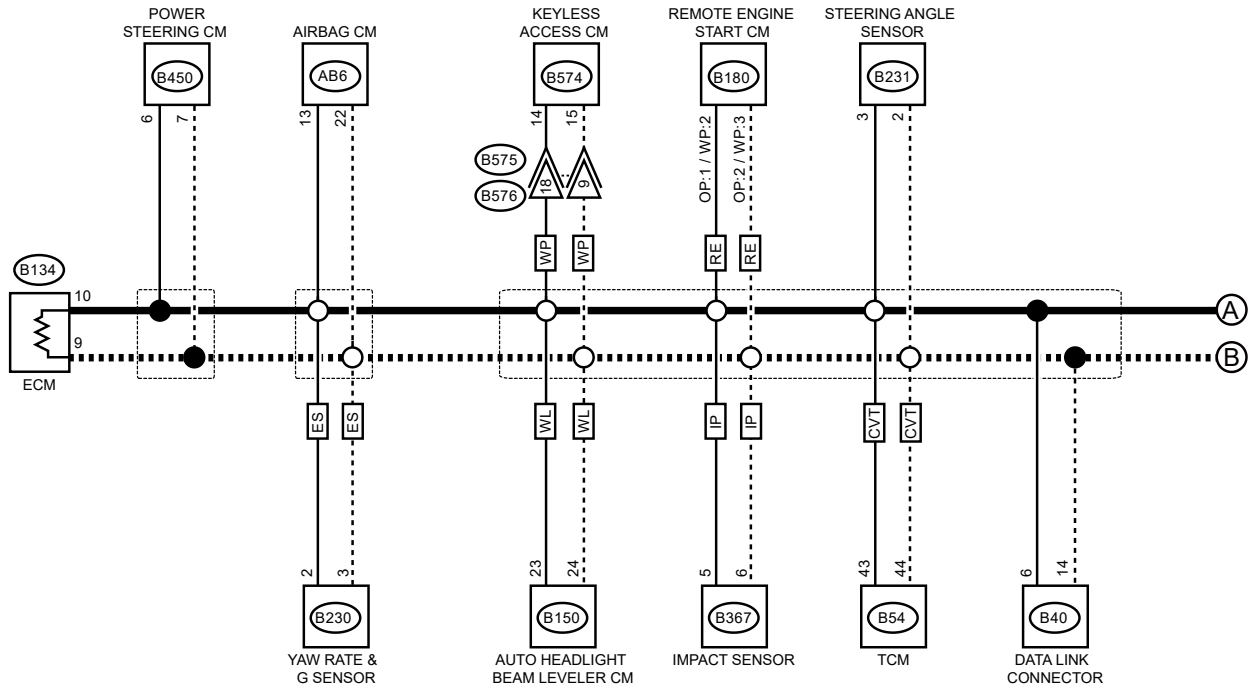
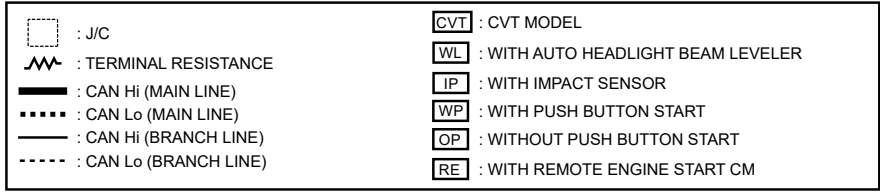




LAN10705

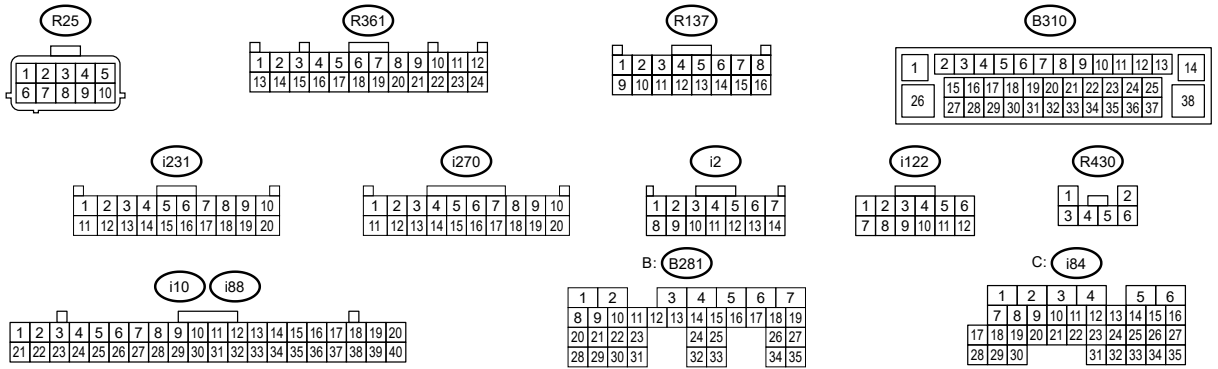
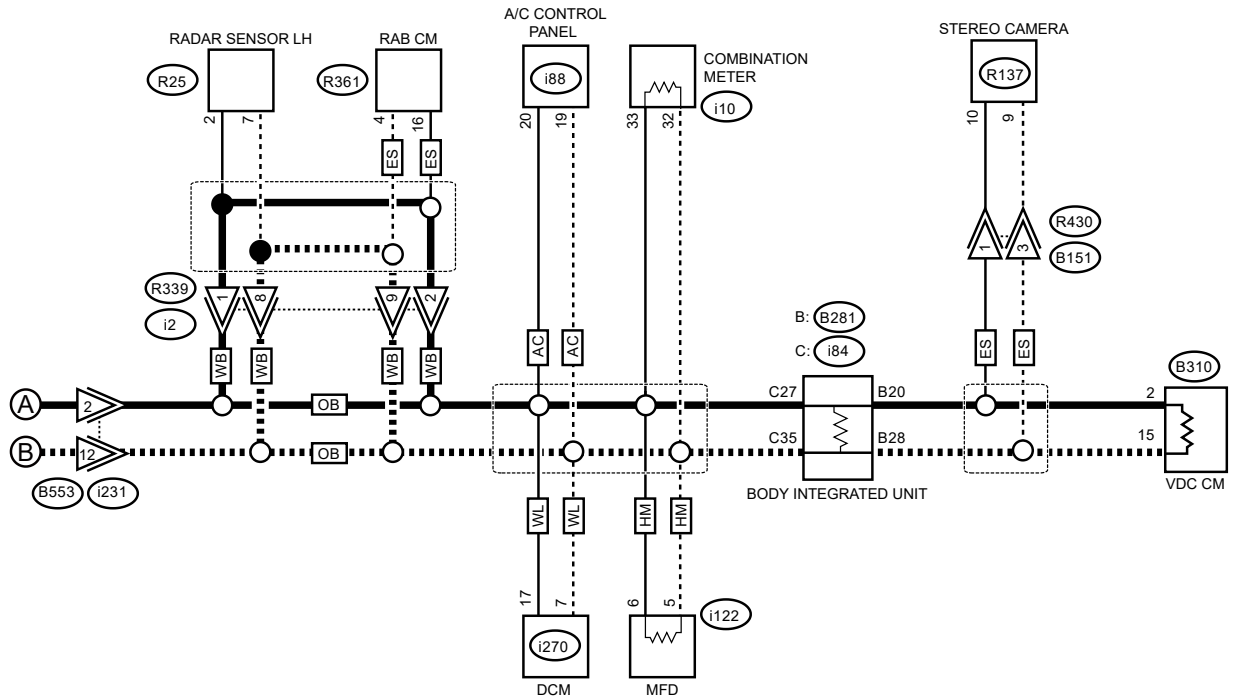
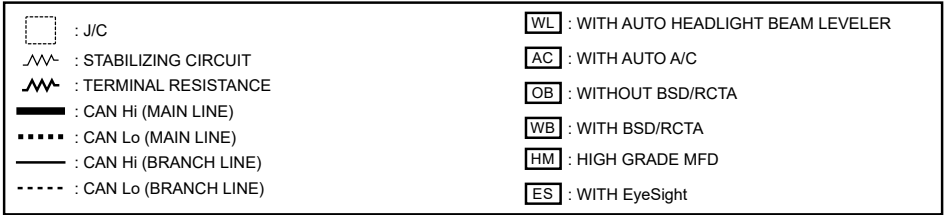
• Turbo model





LAN10706





LAN10705

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the impact sensor connector.
2. Using the tester, measure the resistance between terminals.

Connector & terminal
(B367) No. 5 — No. 6:

Is the resistance 400 Ω or more?




Related lines between the impact sensor and main wiring harness is open, or main

Yes

wiring harness is open at two places or more.

No

 [Go to 2.](#)

2. CHECK RELATED LINES.

Using the tester, measure the resistance between terminals.

Connector & terminal

(B367) No. 6 — (B40) No. 14:

(B367) No. 5 — (B40) No. 6:

Is the resistance 10 Ω or more?

Yes

Repair or replace the open circuit of the impact sensor system related lines.

No

The communication harness is normal. Check the impact sensor.

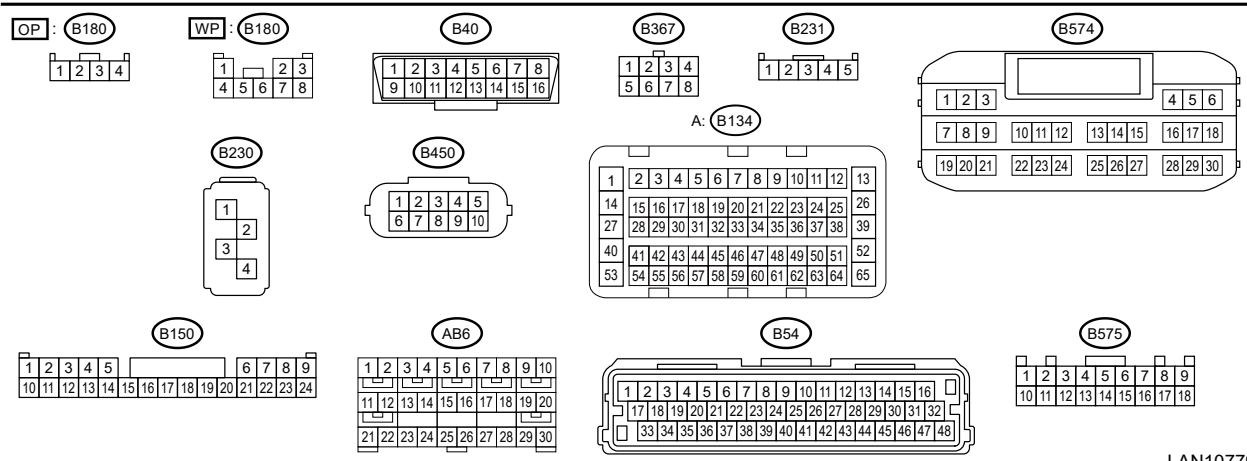
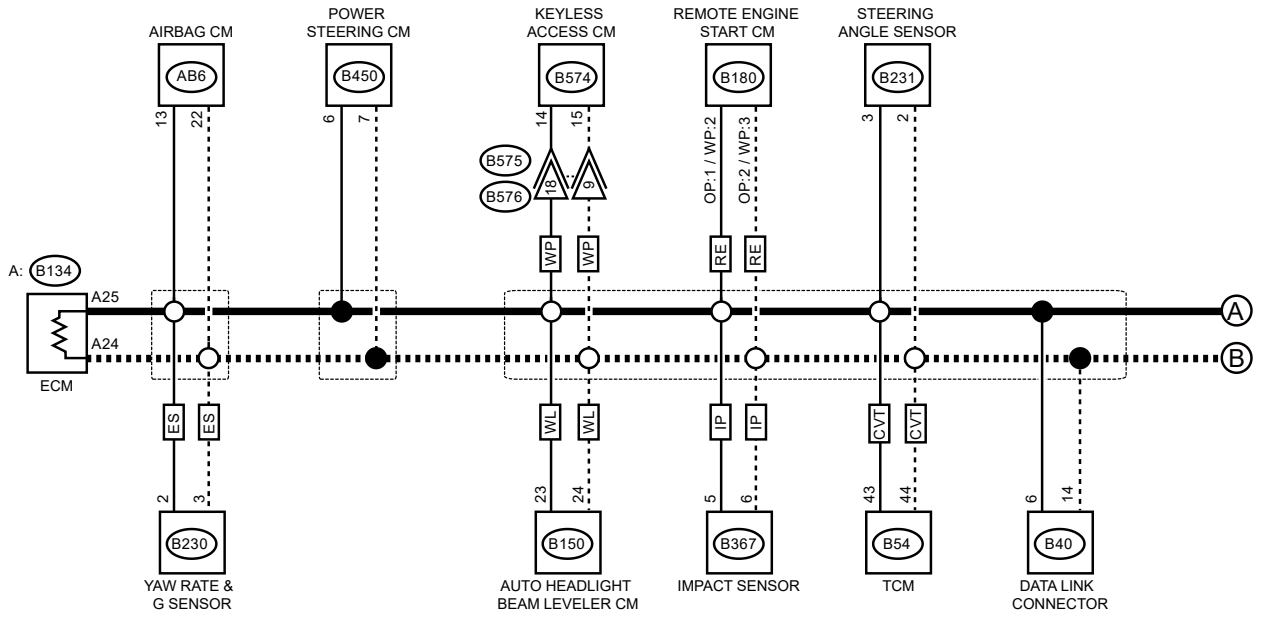
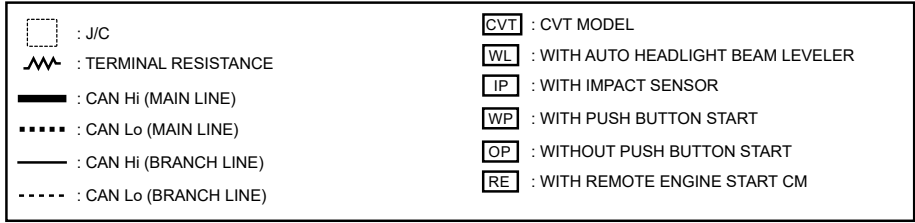
18. RELATED LINE 53 — 61 Ω (YAW RATE & G SENSOR)

Wiring diagram:

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)

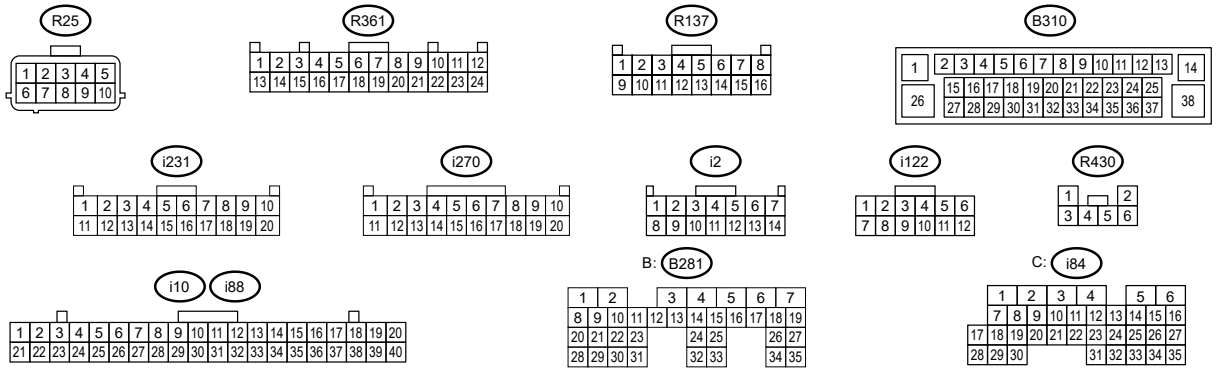
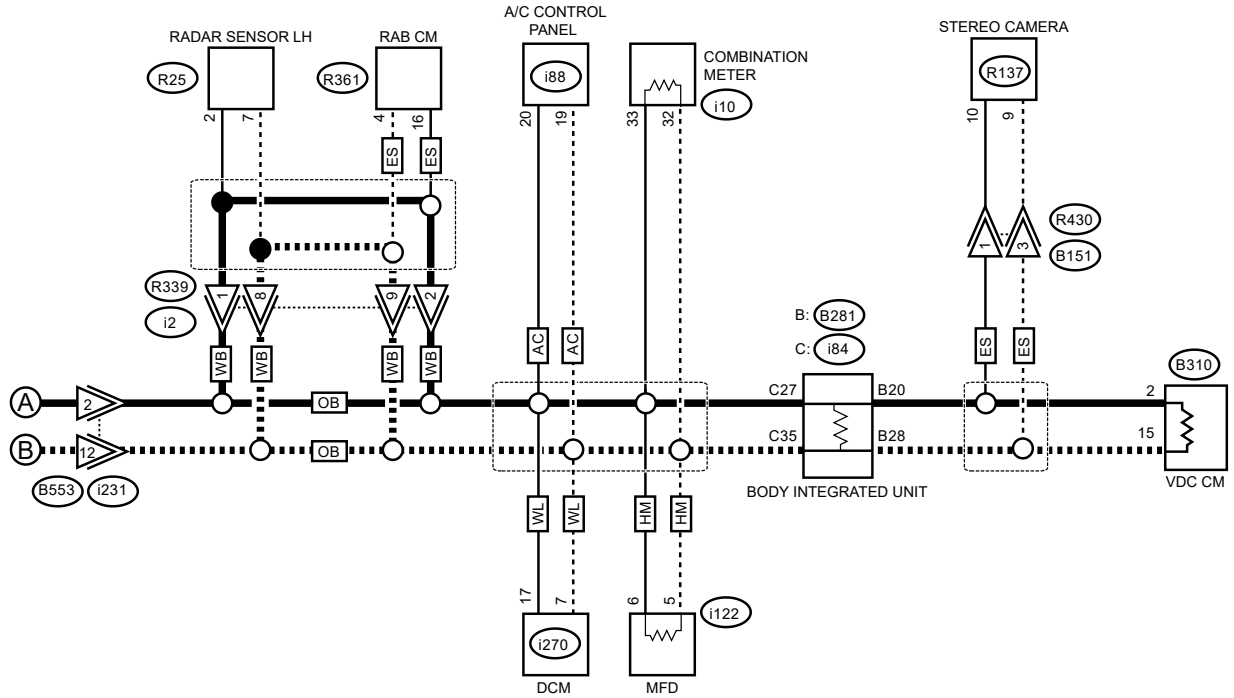
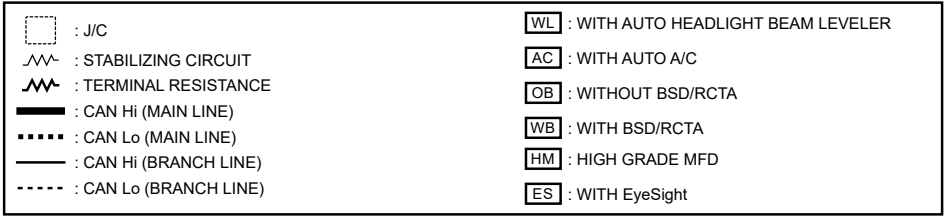
- Non-turbo model





LAN10779

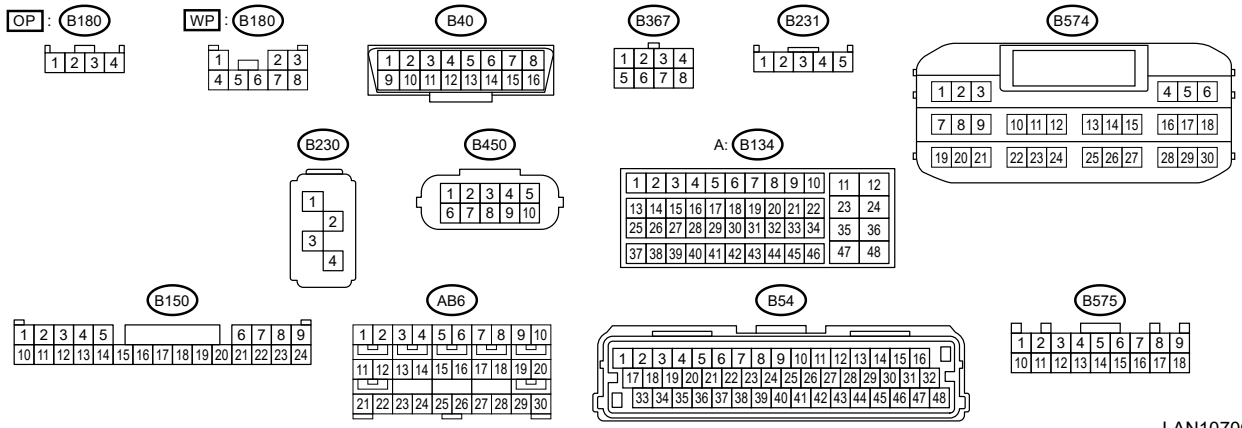
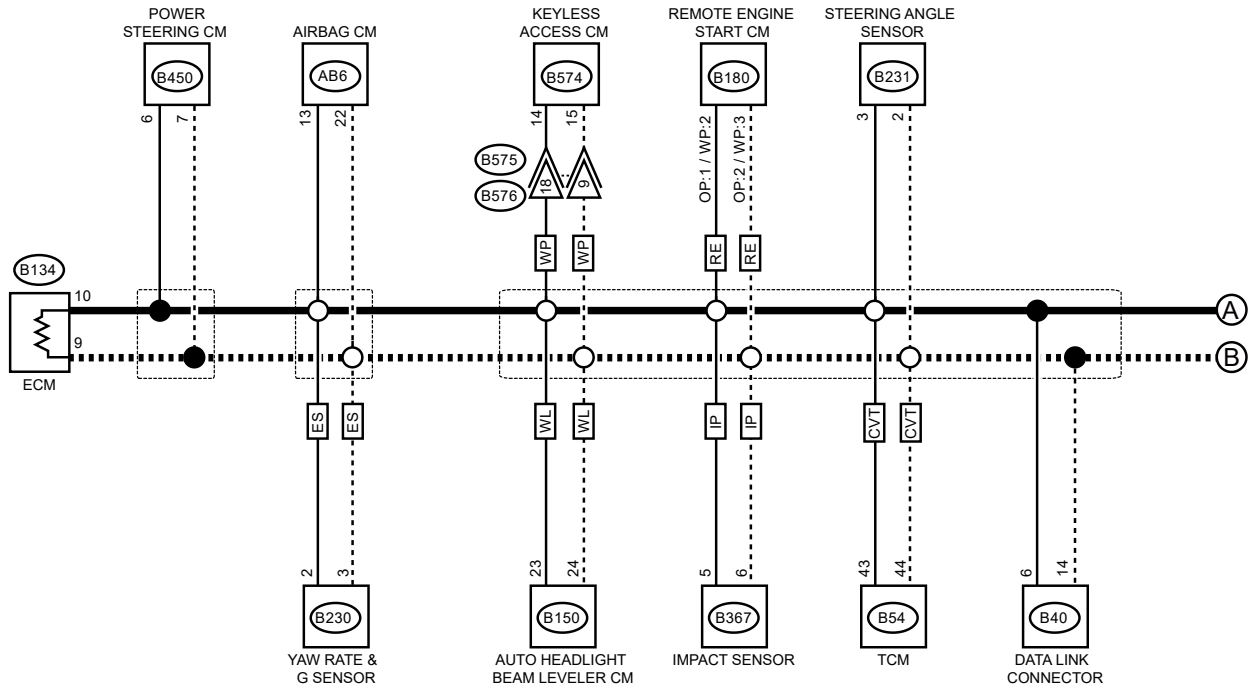
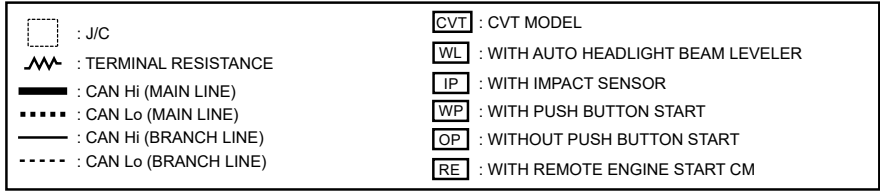




LAN10705

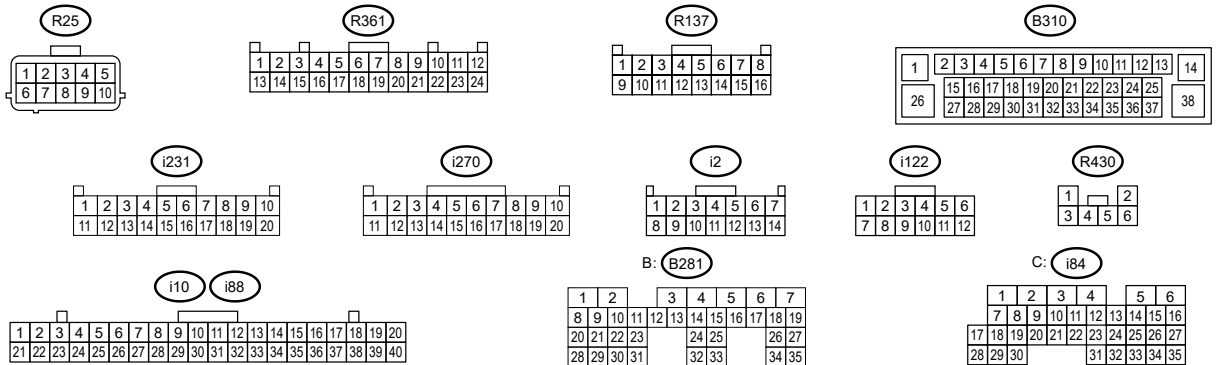
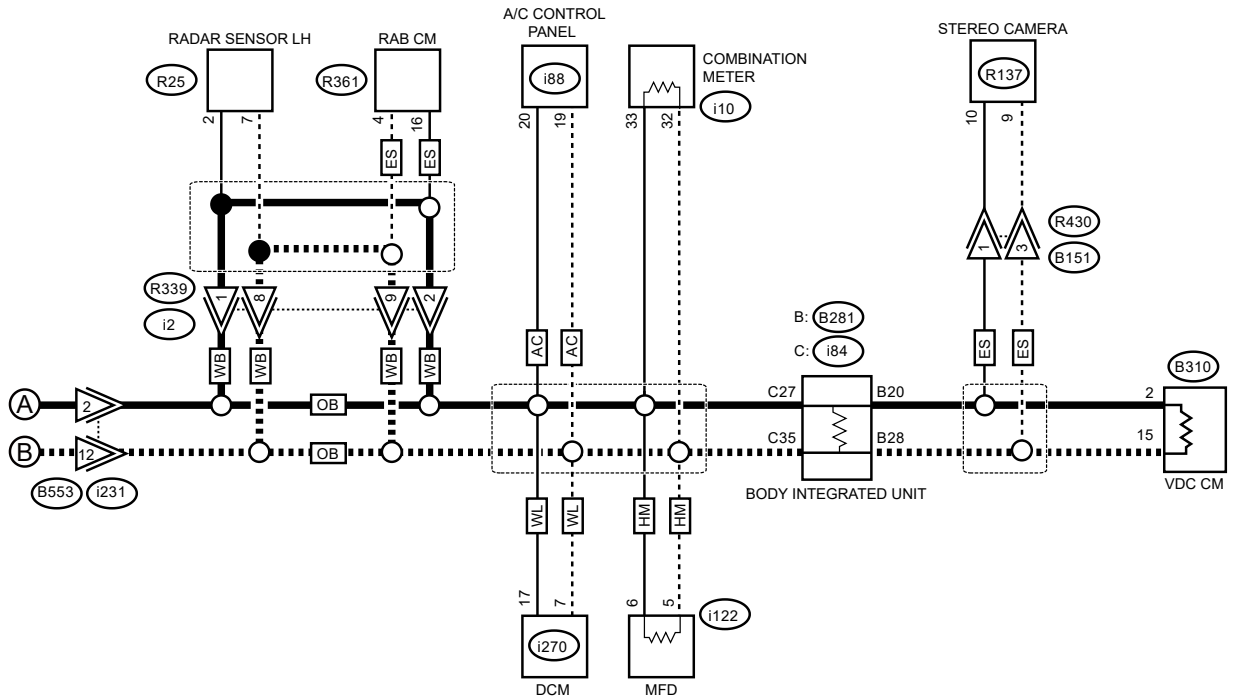
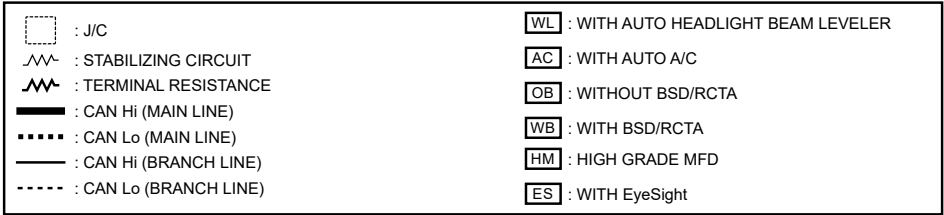
• Turbo model





LAN10706





LAN10705

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the yaw rate & G sensor connector.
2. Using the tester, measure the resistance between terminals.

Connector & terminal
(B230) No. 2 — No. 3:

Is the resistance 400 Ω or more?




Related lines between yaw rate & G sensor and main wiring harness is open, or

Yes

main wiring harness is open at two places or more.

No

 [Go to 2.](#)

2. CHECK RELATED LINES.

Using the tester, measure the resistance between terminals.

Connector & terminal

(B230) No. 3 — (B40) No. 14:


(B230) No. 2 — (B40) No. 6:

Is the resistance 10 Ω or more?

Yes


Repair or replace the open circuit portion of yaw rate & G sensor related lines.

No

Check DTC of VDC system.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

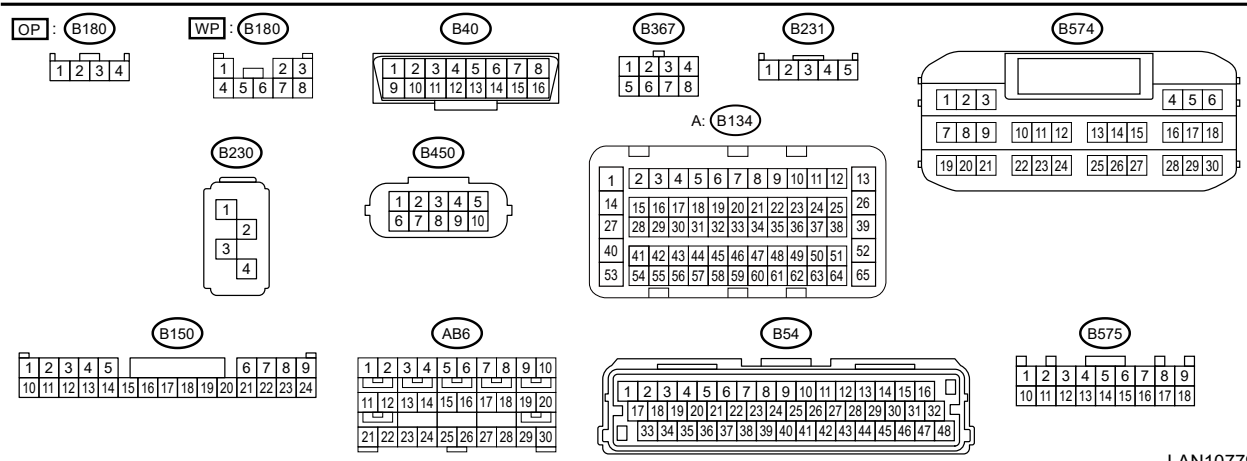
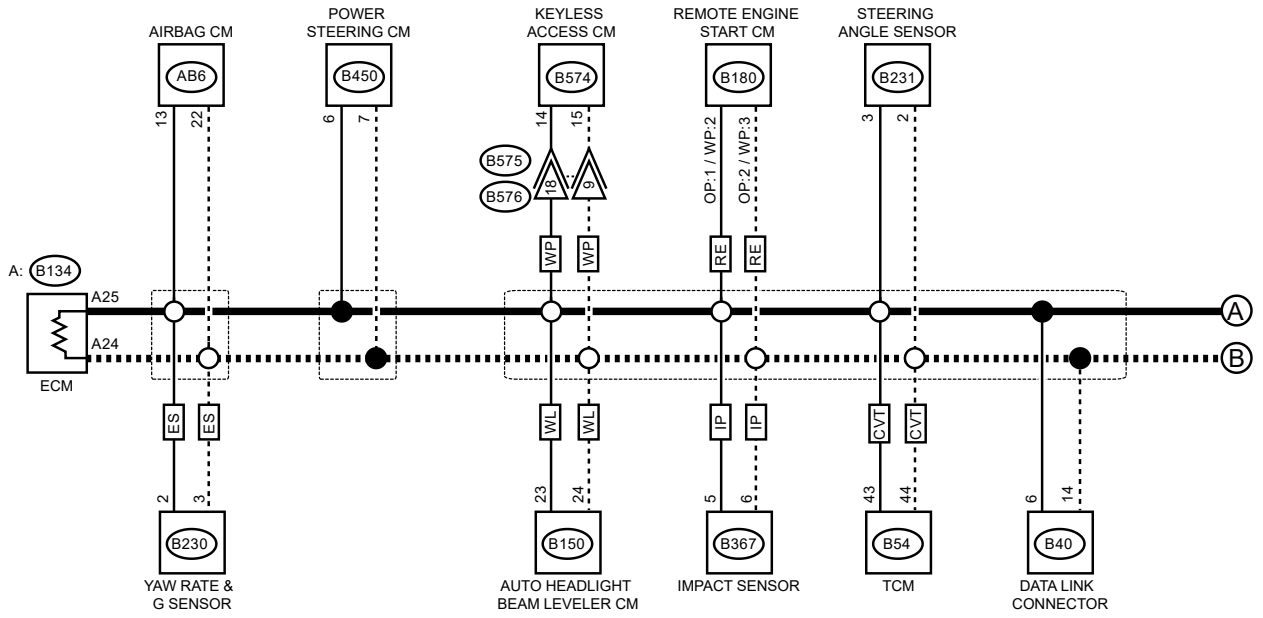
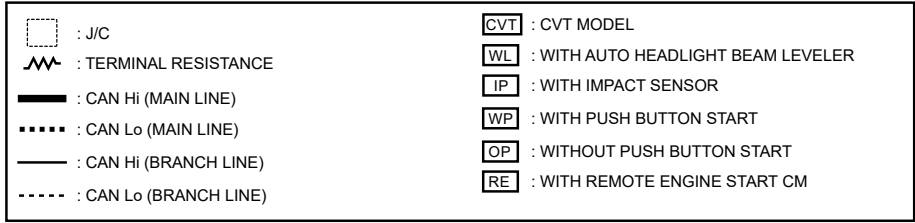
19. RELATED LINES 53 — 61 Ω (TELEMATICS)

Wiring diagram:

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)

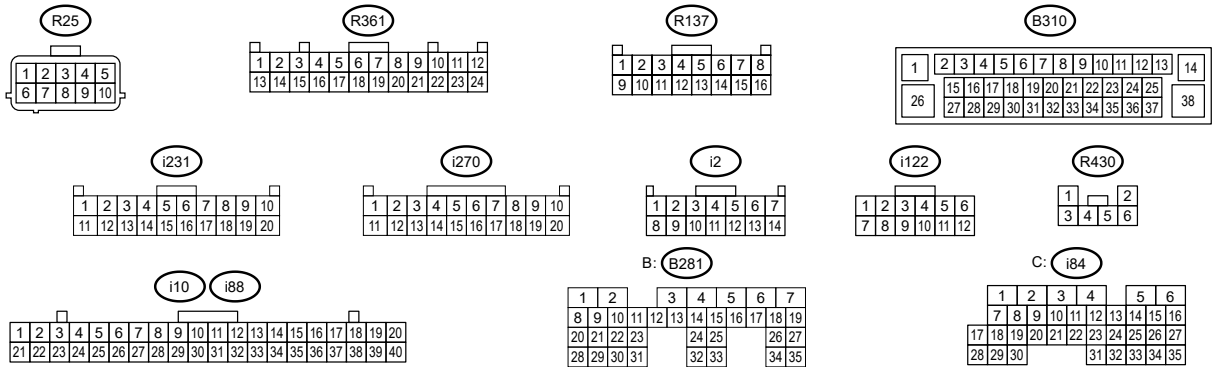
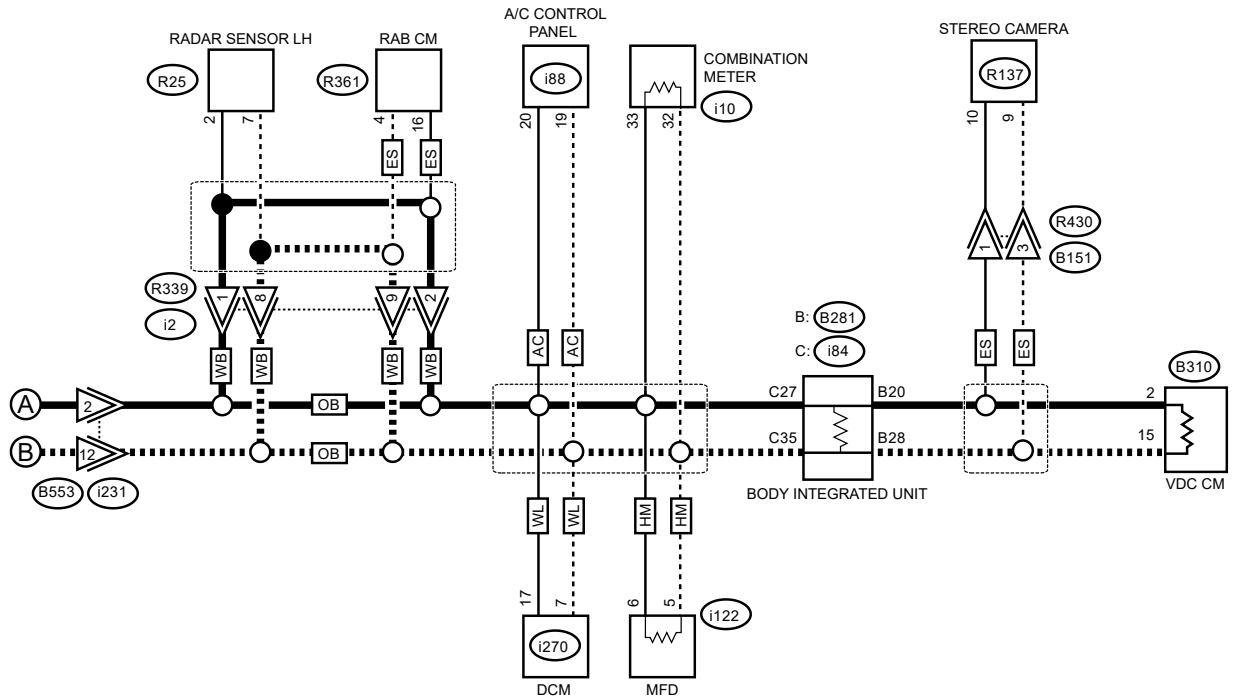
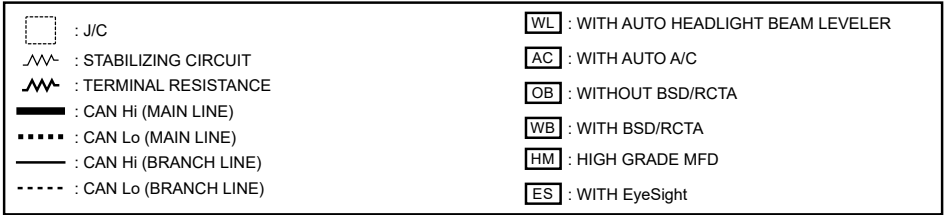
- Non-turbo model





LAN10779

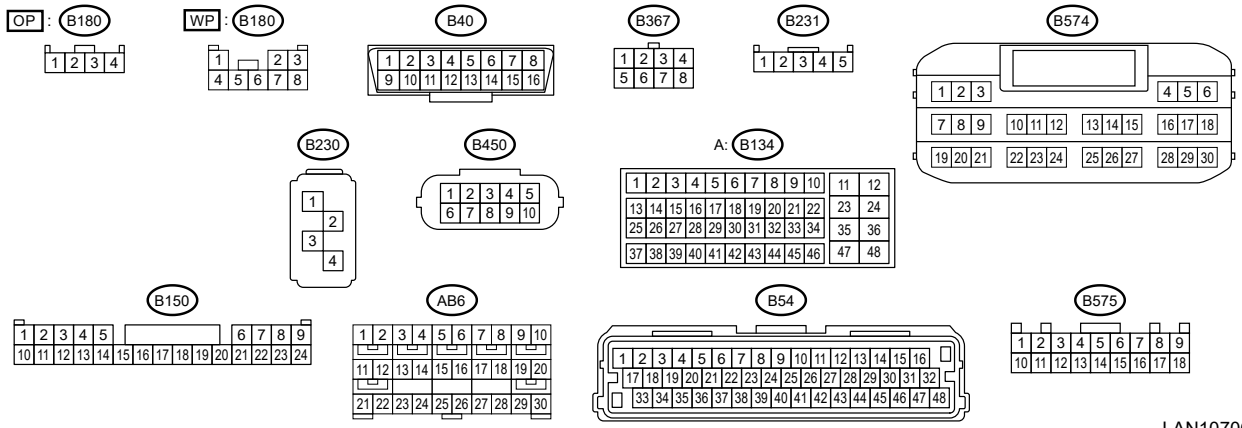
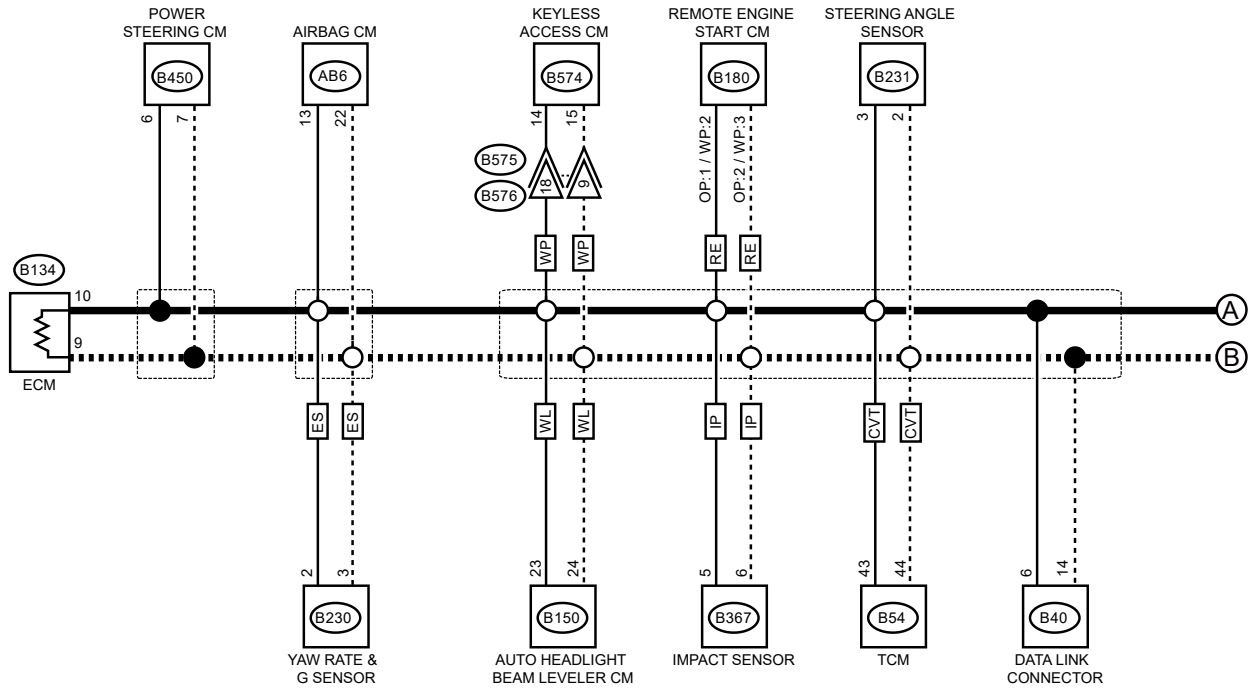
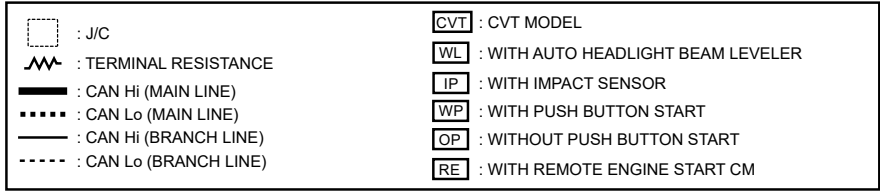




LAN10705

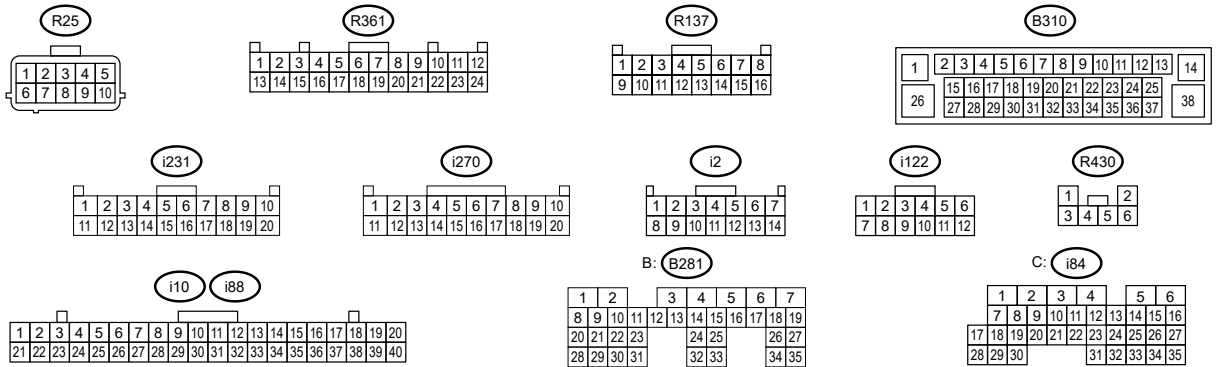
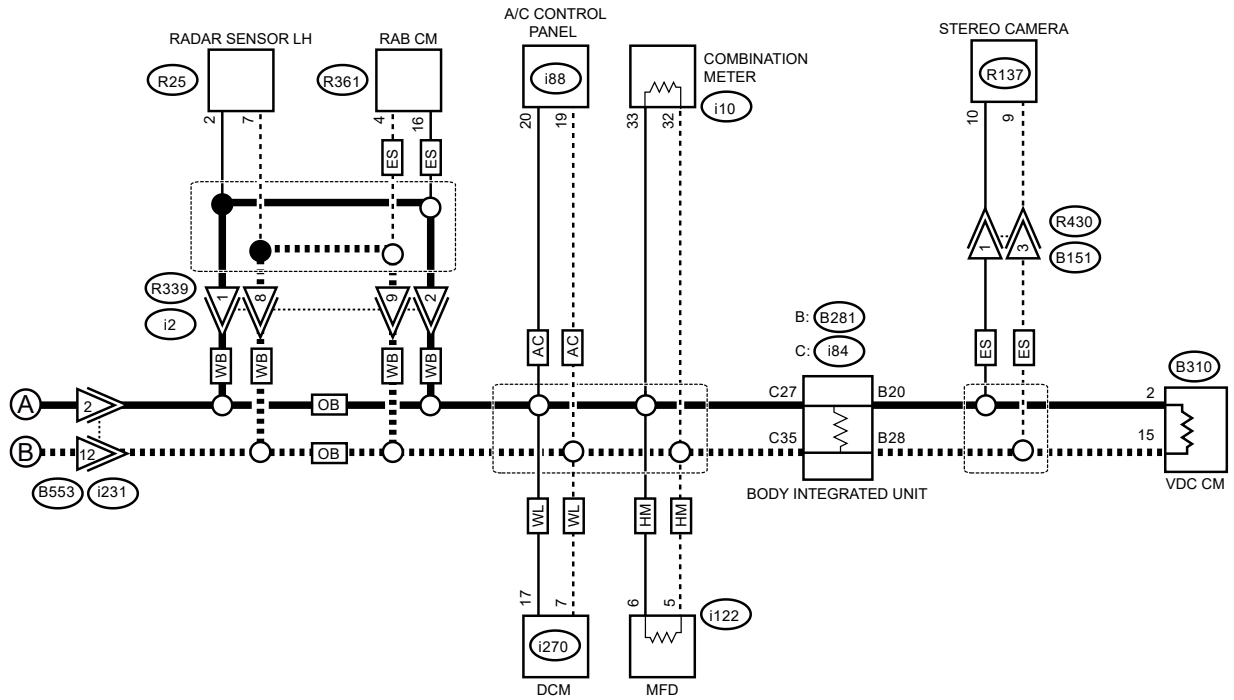
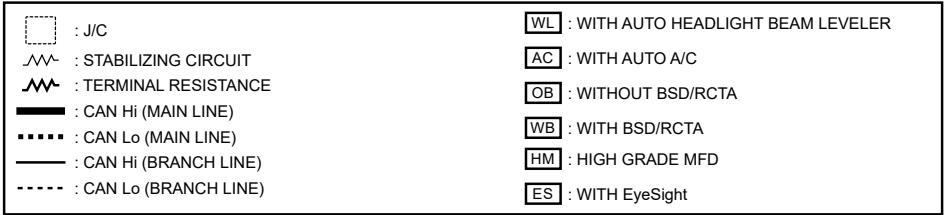
• Turbo model





LAN10706





LAN10705

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the DCM connector.
2. Using the tester, measure the resistance between terminals.

Connector & terminal

(i270) No. 7 — No. 17:

Is the resistance 400 Ω or more?




Related lines between DCM and main wiring harness is open, or main wiring

Yes

harness is open at two places or more.

No

 [Go to 2.](#)

2. CHECK RELATED LINES.

Using the tester, measure the resistance between terminals.

Connector & terminal

(i270) No. 7 — (B40) No. 14:

(i270) No. 17 — (B40) No. 6:

Is the resistance 10 Ω or more?

Yes

Repair or replace the open circuit of telematics system related lines.

No

Check DTC of the telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

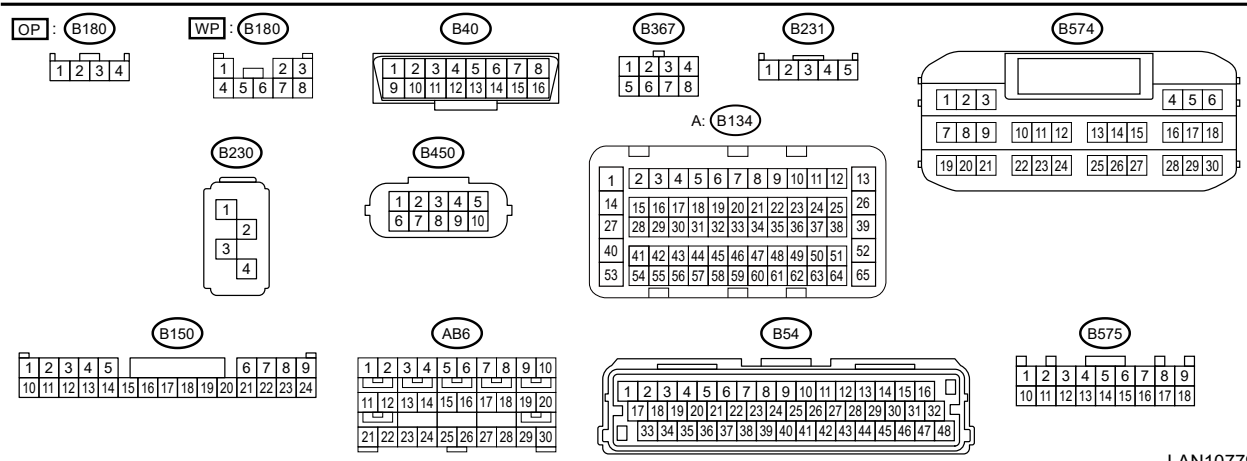
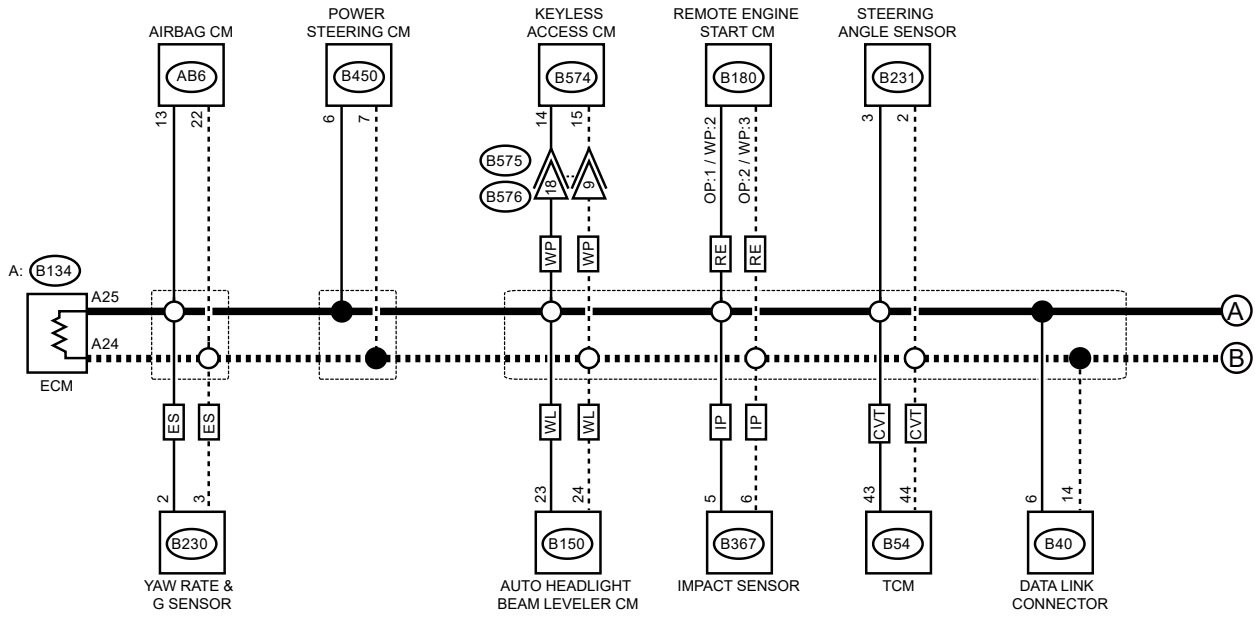
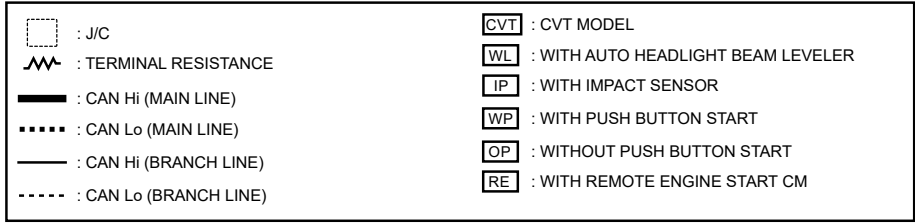
20. RELATED LINES 53 — 61 Ω (BSD/RCTA)

Wiring diagram:

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)

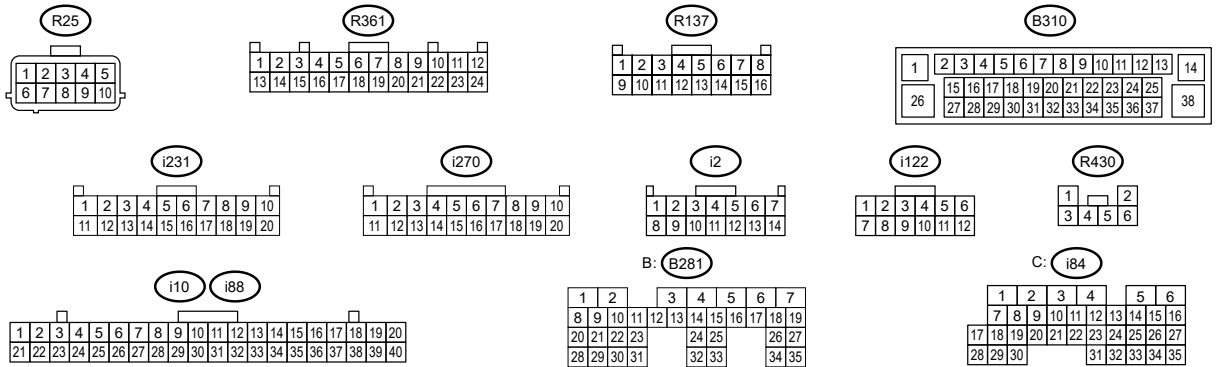
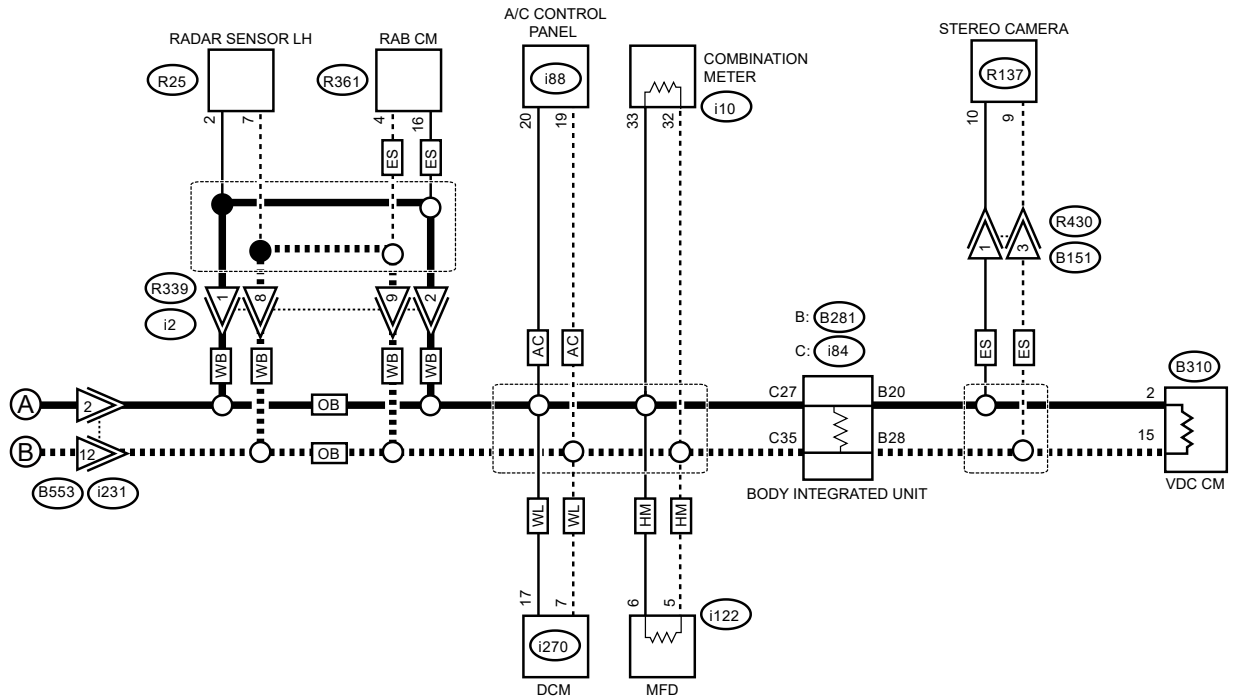
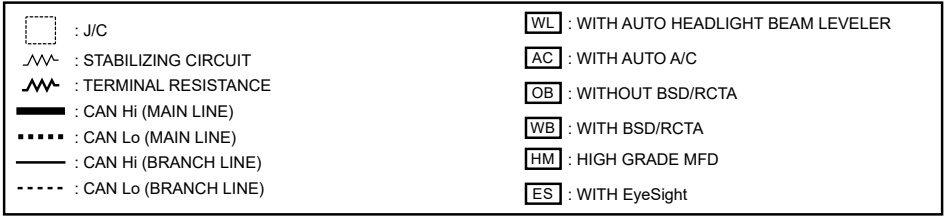
- Non-turbo model





LAN10779

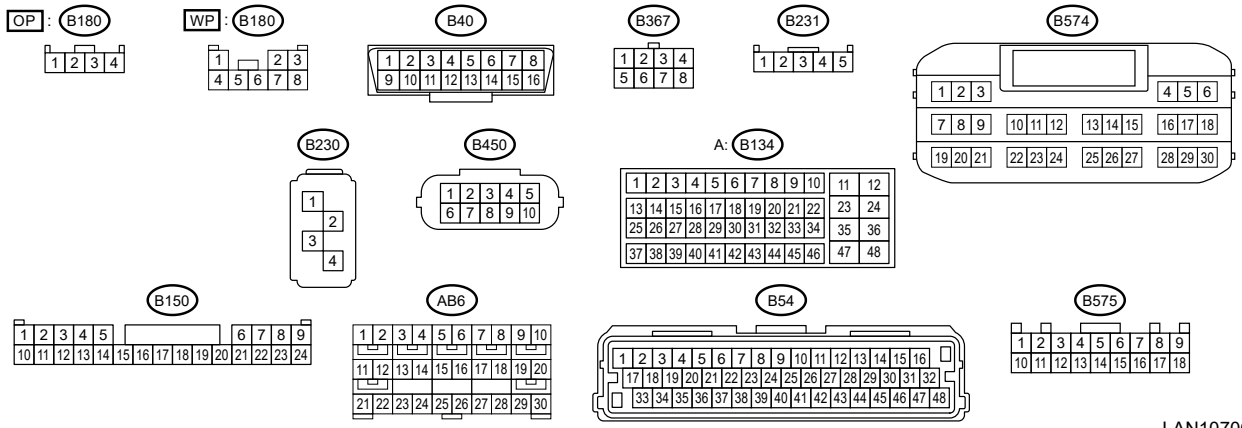
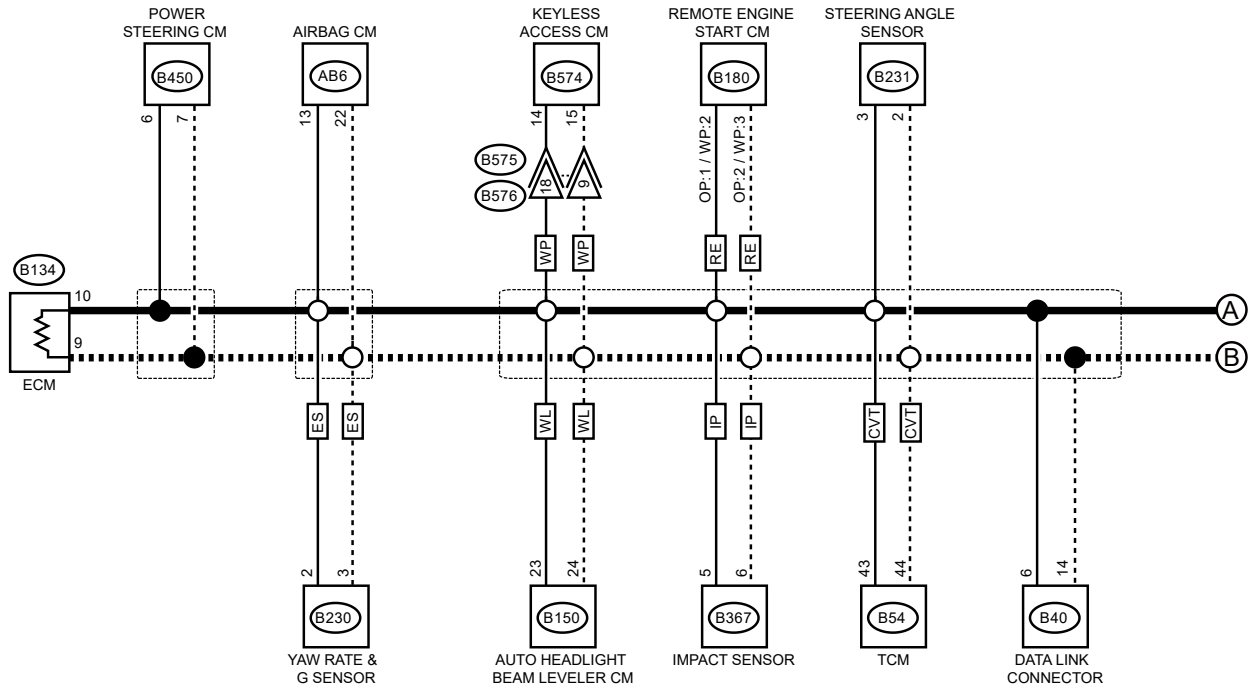
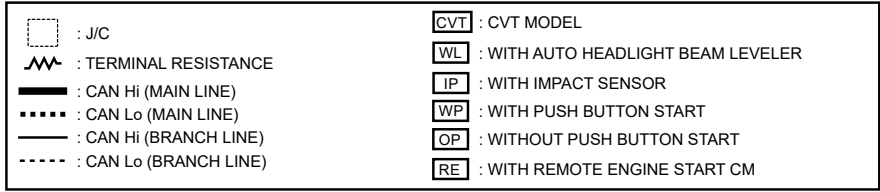




LAN10705

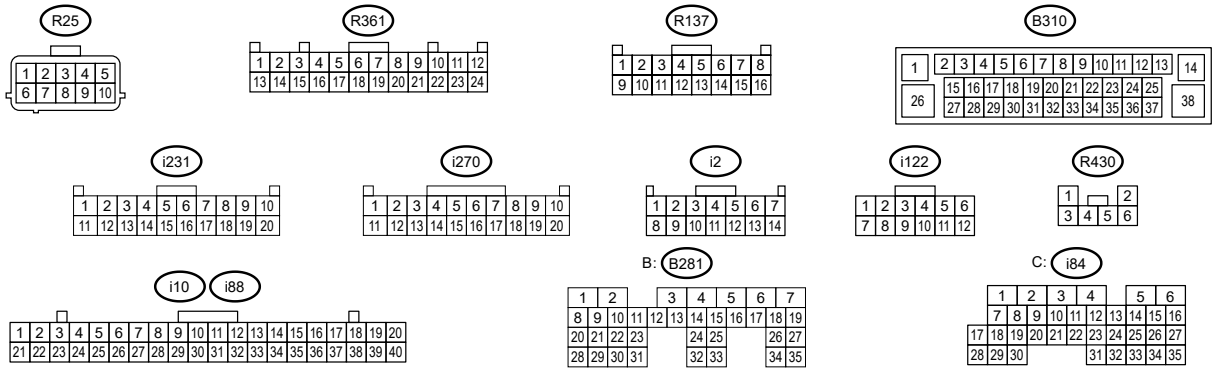
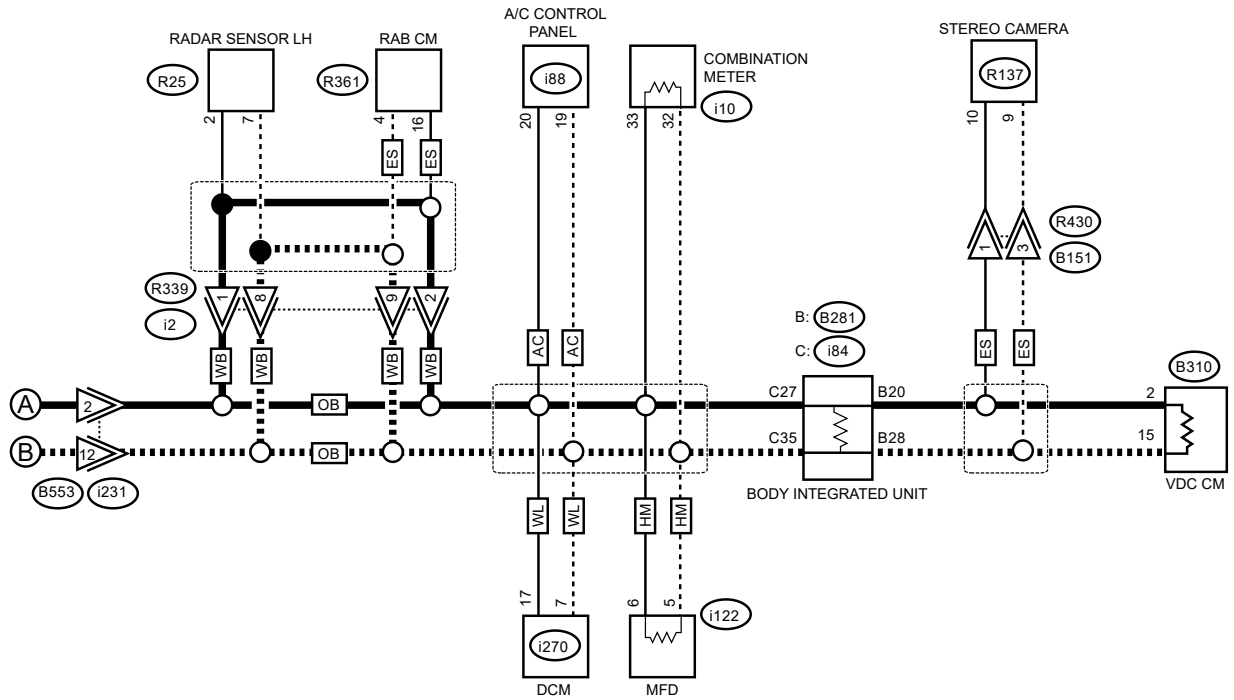
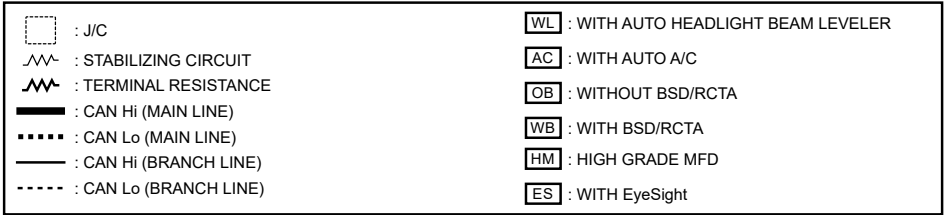
• Turbo model





LAN10706





LAN10705

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.



1. Disconnect the radar sensor LH connector.
2. Using the tester, measure the resistance between terminals.

Connector & terminal

(R25) No. 2 — No. 7:

Is the resistance 400 Ω or more?




Related lines between radar sensor LH and main wiring harness is open, or main

Yes

wiring harness is open at two places or more.

No

 [Go to 2.](#)

2. CHECK RELATED LINES.

Using the tester, measure the resistance between terminals.

Connector & terminal

(R25) No. 2 — (B40) No. 6:


(R25) No. 7 — (B40) No. 14:

Is the resistance 10 Ω or more?

Yes


Repair or replace the open portion of BSD/RCTA related lines.

No

The communication harness is normal. Check DTC of BSD/RCTA.  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

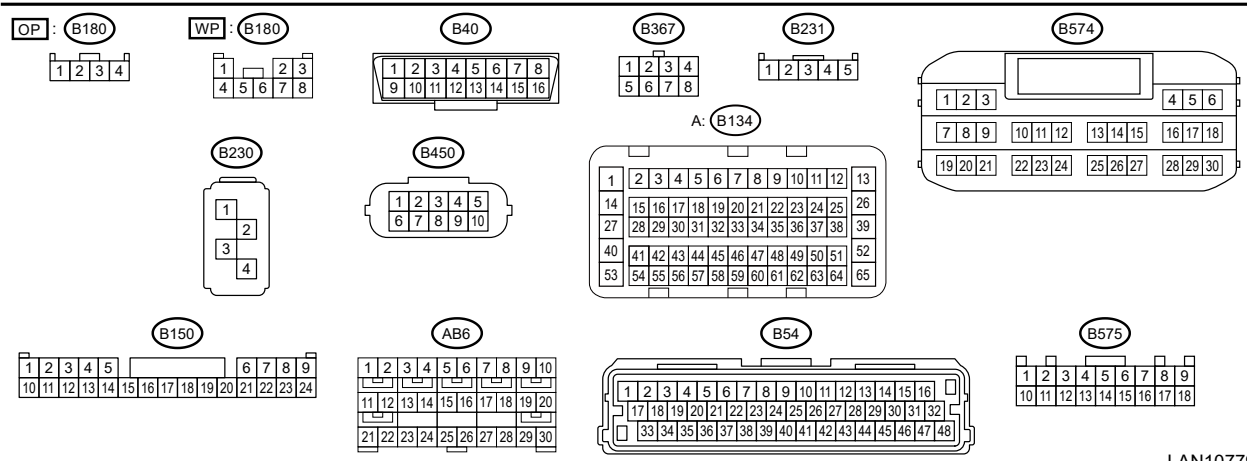
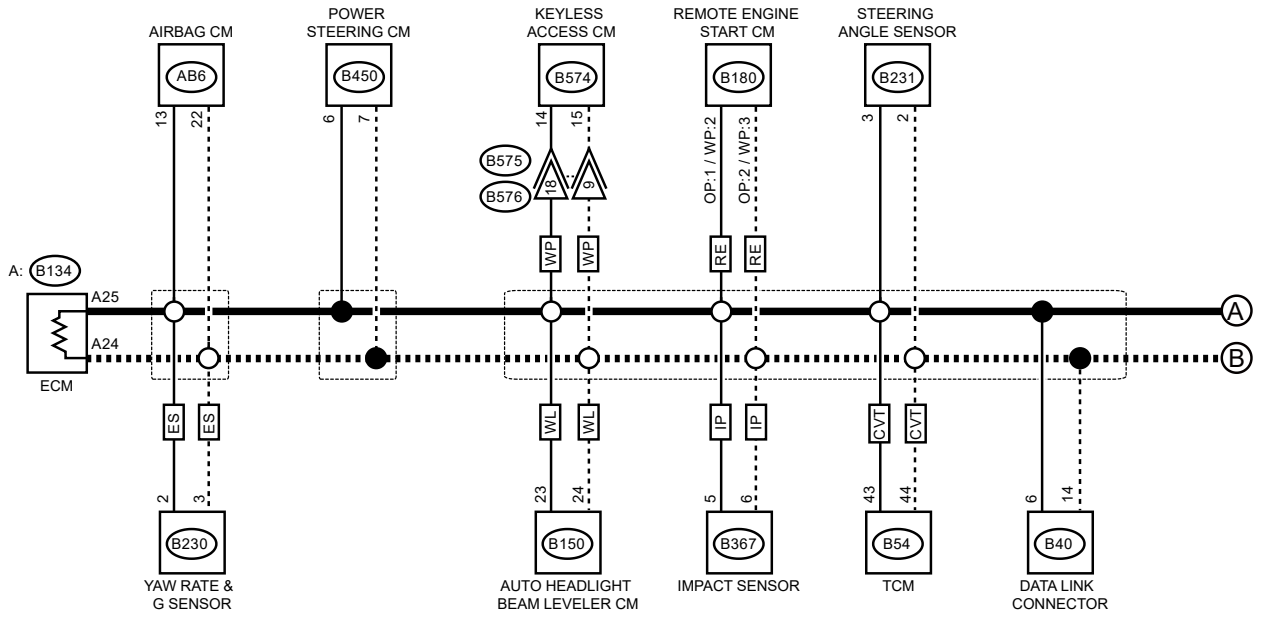
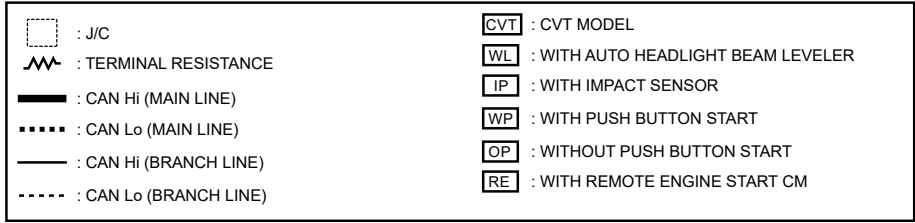
21. RELATED LINES 53 — 61 Ω (RAB)

Wiring diagram:

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)

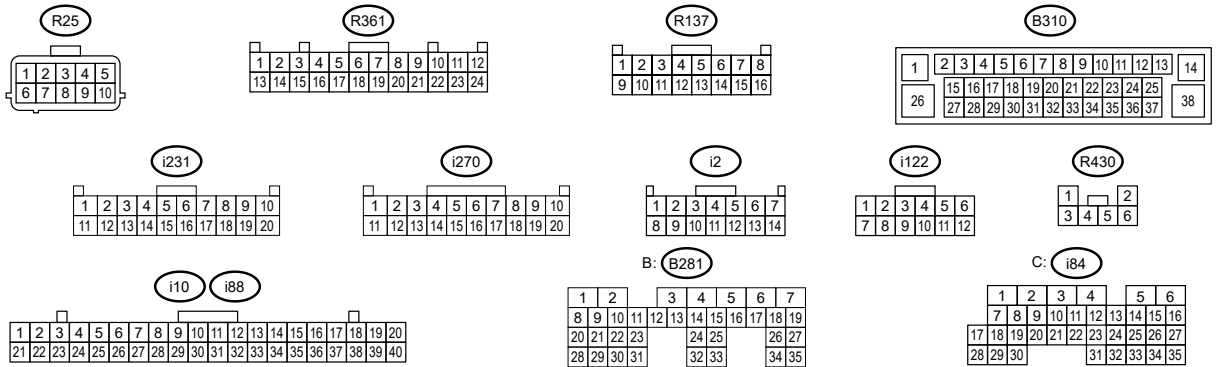
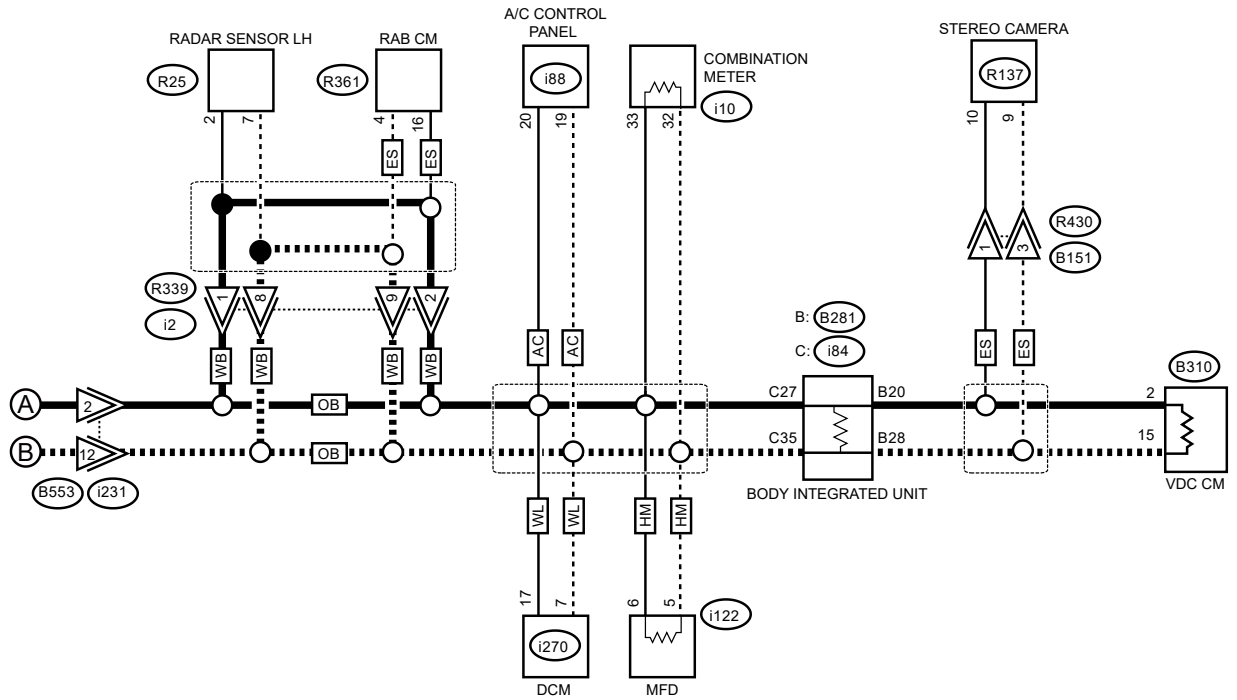
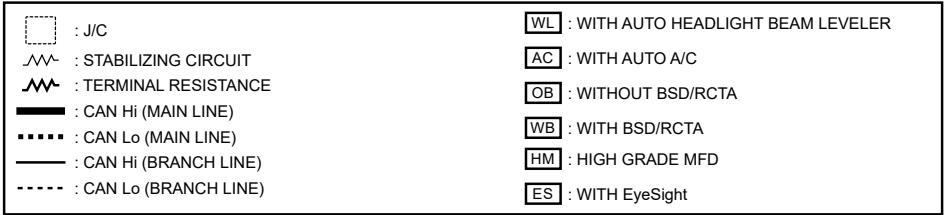
- Non-turbo model





LAN10779

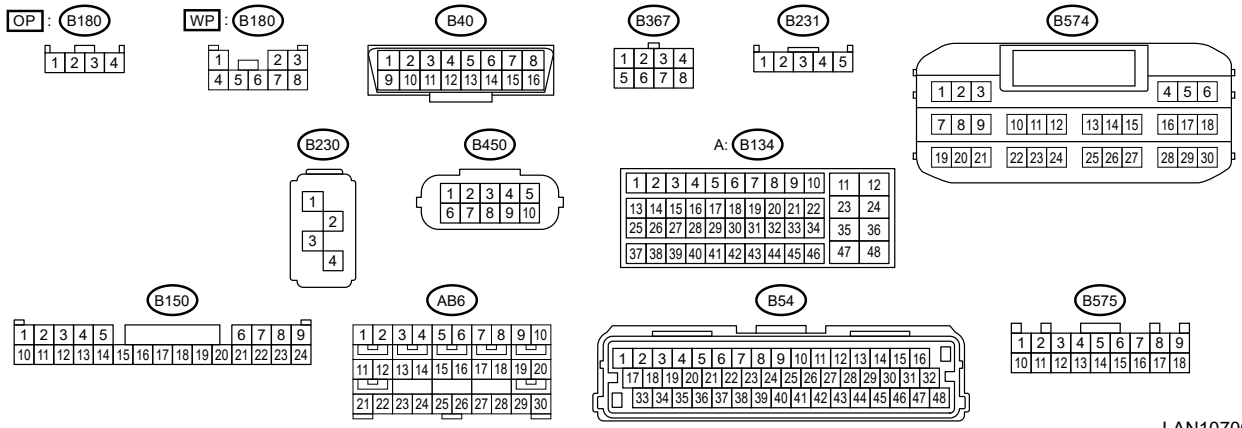
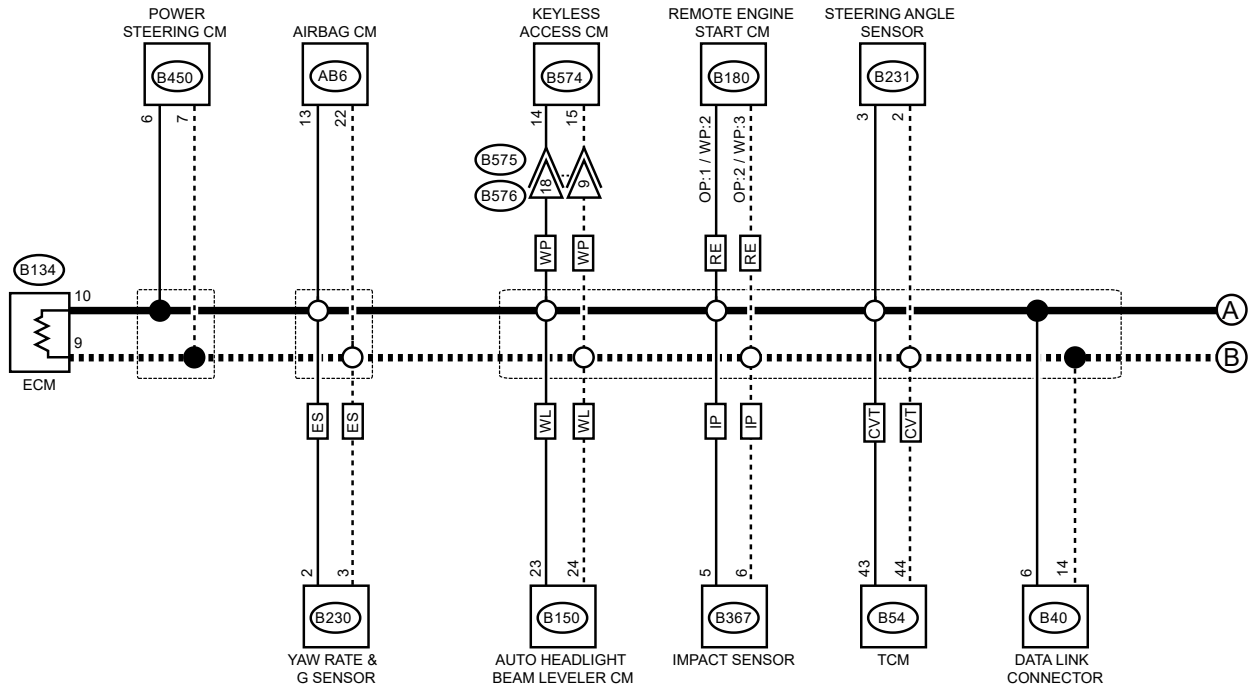
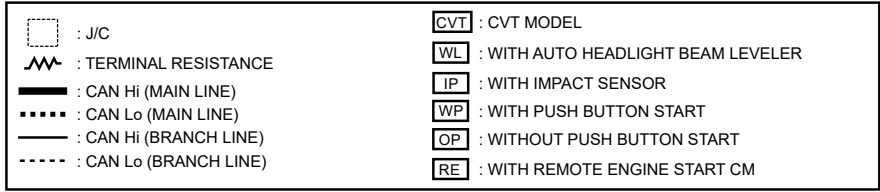




LAN10705

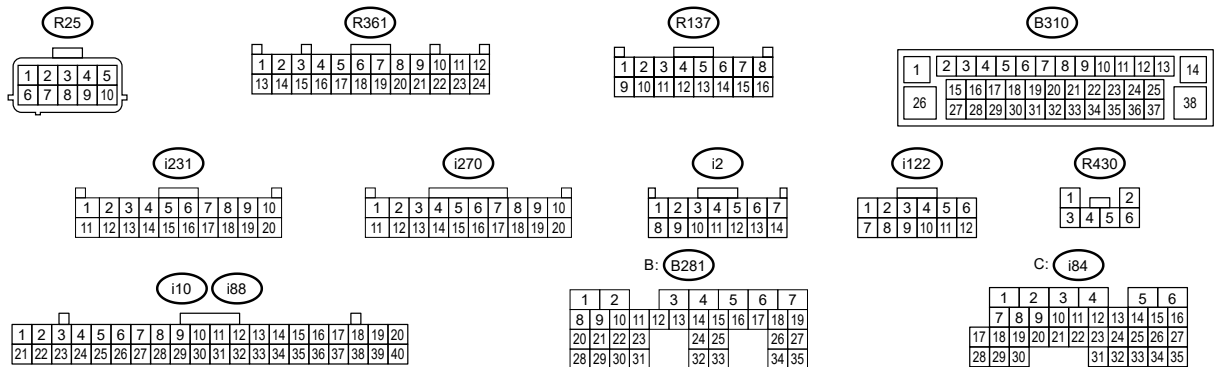
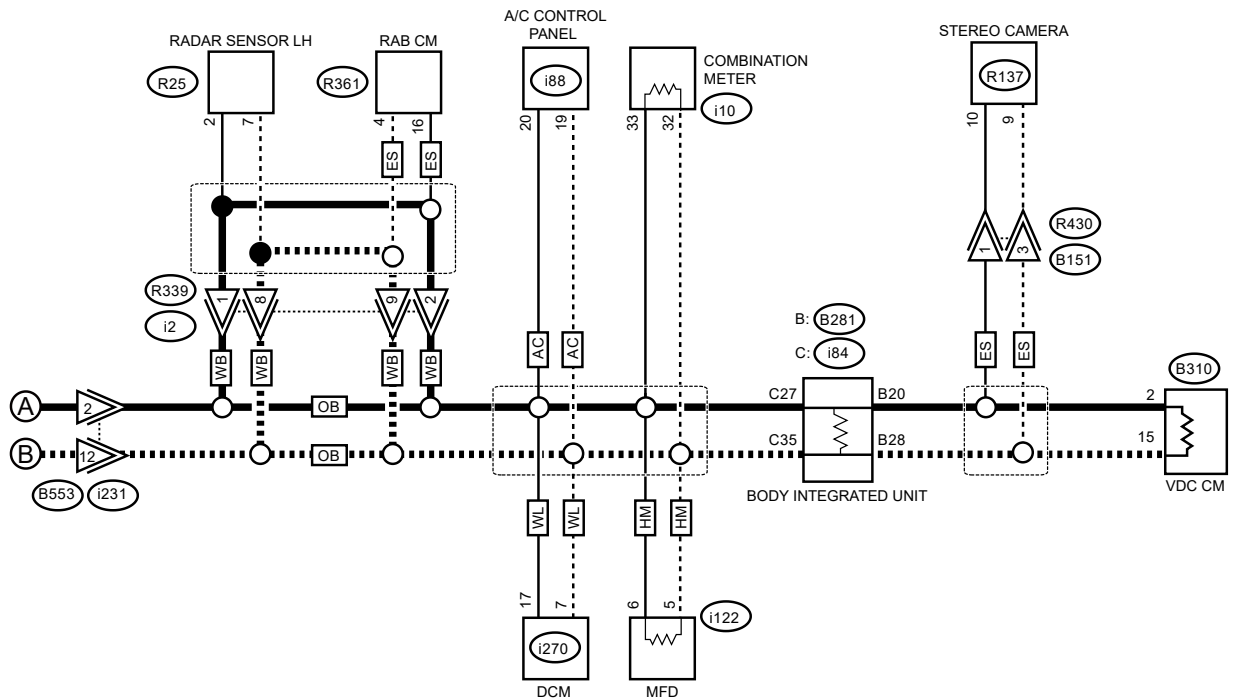
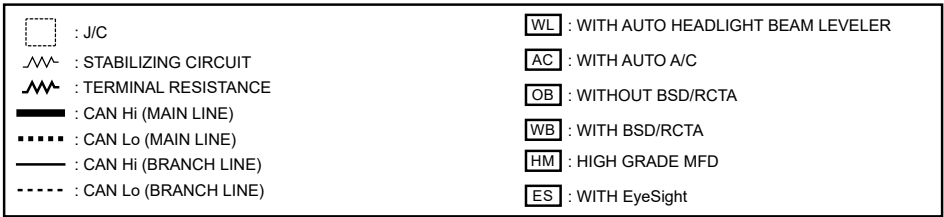
• Turbo model





LAN10706





LAN10705

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the RAB CM connector.
2. Using the tester, measure the resistance between terminals.

Connector & terminal

(R361) No. 4 — No. 16:

Is the resistance 400 Ω or more?




Related lines between RAB CM and main wiring harness is open, or main wiring

Yes

harness is open at two places or more.

No

 [Go to 2.](#)

2. CHECK RELATED LINES.

Using the tester, measure the resistance between terminals.

Connector & terminal

(R361) No. 4 — (B40) No. 14:


(R361) No. 16 — (B40) No. 6:

Is the resistance 10 Ω or more?

Yes









Repair or replace the open circuit of RAB related lines.










No





The communication harness is normal. Check DTC of RAB.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

LAN SYSTEM (DIAGNOSTICS) > CAN Communication Circuit Check

LIST

Resistance value between CAN Hi and Lo	Contents of inspection	Remarks
Ground short inspection	 Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > GROUND SHORT INSPECTION.	Shorted to ground in the communication circuit or control module.
Battery short inspection	 Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > BATTERY SHORT INSPECTION.	Shorted to battery power supply in the communication circuit or control module.
53 – 61 Ω	 Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > 53 – 61 Ω.	Combined resistance of end resistance does not have malfunction; short to ground or +B short of the CAN communication circuit is possible, however.
52 Ω or less	 Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > 52 Ω OR LESS.	Resistance is lower than combined resistance of end resistance. Short to CAN Hi and CAN Lo on the CAN communication circuit is possible.
62 Ω or more	 Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > 62 Ω OR MORE.	Resistance is higher than combined resistance of end resistance. Open circuit of CAN communication circuit is possible.
Related lines 53 – 61 Ω (TCM)	 Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 – 61 Ω (TCM).	No TCM data is received. Perform inspection when faulty is detected.
Related lines 53 – 61 Ω (steering angle sensor)	 Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 – 61 Ω (STEERING ANGLE SENSOR).	No steering angle sensor data is received. Perform inspection when faulty is detected.
Related line 53 – 61 Ω (A/C control panel)	 Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION >	No A/C data is received. Perform inspection when faulty is detected.

	RELATED LINE 53 — 61 Ω (A/C CONTROL PANEL).	
Related lines 53 — 61 Ω (power steering CM)	 Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (POWER STEERING CM).	No electric power steering data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (combination meter)	 Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (COMBINATION METER).	No meter data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (MFD)	 Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (MFD).	No MFD data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (airbags)	 Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (AIRBAG CM SYSTEM).	No airbag data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (keyless access system)	 Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (KEYLESS ACCESS SYSTEM).	No keyless access CM data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (stereo camera)	 Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (STEREO CAMERA).	No stereo camera data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (remote engine starter)	 Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (REMOTE ENGINE STARTER).	Perform inspection when the remote engine starter does not operate, while the mobile key side operates normally.
Related lines 53 — 61 Ω (headlight beam leveler)	 Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (HEADLIGHT BEAM LEVELER).	No headlight beam leveler data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (impact sensor system)	 Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION >	No impact sensor data is received. Perform

	RELATED LINES 53 — 61 Ω (IMPACT SENSOR SYSTEM).	inspection when faulty is detected.
Related line 53 — 61 Ω (yaw rate & G sensor)	 Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINE 53 — 61 Ω (YAW RATE & G SENSOR).	No yaw rate & G sensor data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (Telematics)	 Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (TELEMATICS).	No telematics data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (BSD/RCTA)	 Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (BSD/RCTA).	No BSD/RCTA data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (RAB)	 Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (RAB).	Perform inspection when no RAB data is received, or invalid data is detected.


LAN SYSTEM (DIAGNOSTICS) > CAN Communication Circuit Check

PROCEDURE

Note:

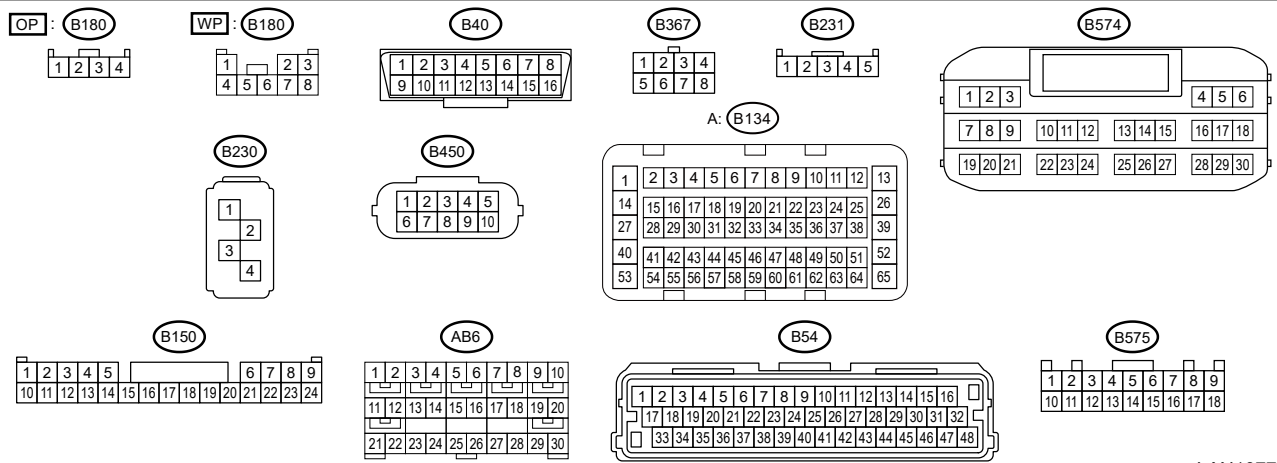
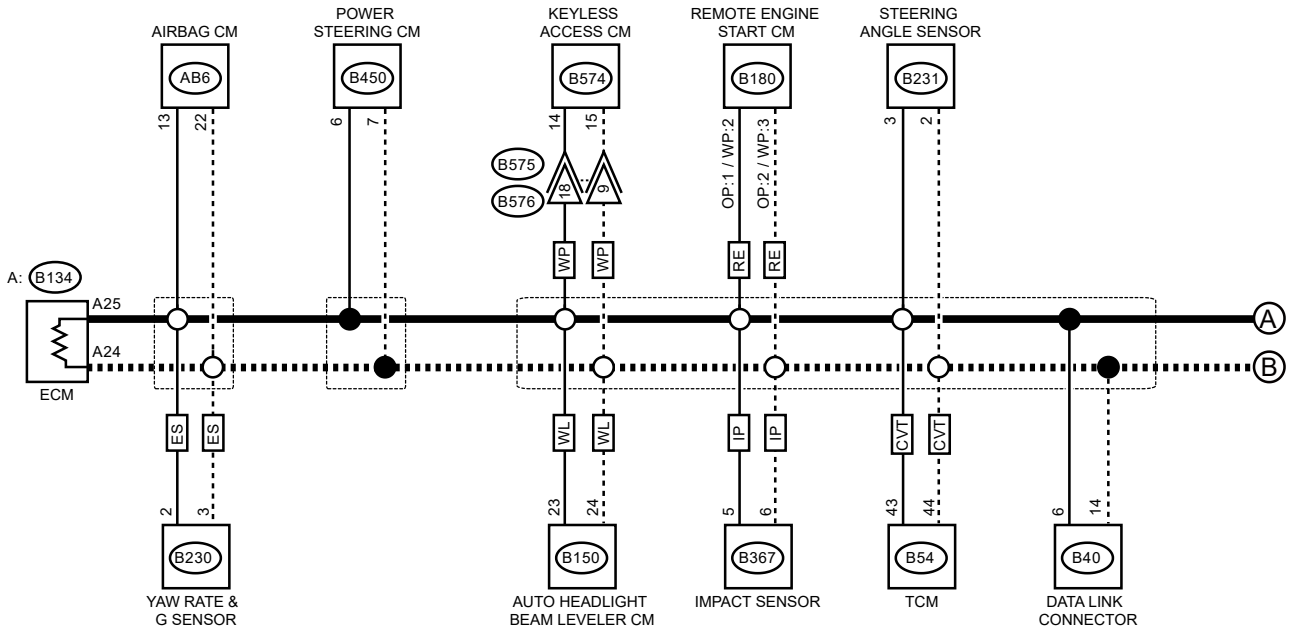
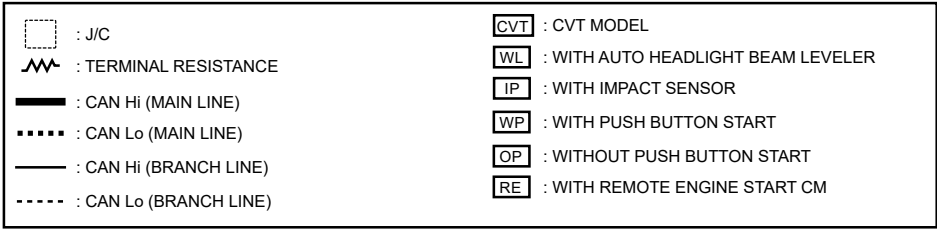
- When measuring the resistance of CAN communication circuit, measure it in sleep status.
To enter sleep status
 - With ignition switch OFF and key or switch operation stopped, keep the doors, trunk, and rear gate all closed for one minute or more.
 - On models with keyless access function, keep the access key 2 m or more away from the vehicle.
- When the bus line is measured, combined resistance of the end resistance (120 Ω) in ECM and the end resistance (120 Ω) in VDC CM can be measured. The combined resistance is approximately 53 – 61 Ω with the stabilizing circuit included. If the measured resistance value becomes 52 Ω or less, main wiring harness or related lines may be shorted. Or, the combined resistance may have changed because of a resistance other than the end resistance created on the circuit. If the measured value is 62 Ω or more, there may be a malfunction such as open circuit in one of the end resistances, in the stabilizing circuit, or in the main wiring harness.
Also, even when the resistance value falls within approx. 53 – 61 Ω, related lines may be open if an error of communication for initializing or a CAN system U-code has occurred. (The resistance cannot be between approx. 53 – 61 Ω if the main wiring harness is open.)

Wiring diagram:

CAN communication system  Ref. to [WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)

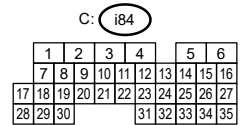
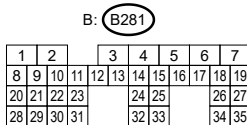
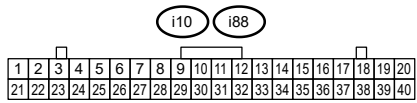
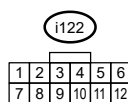
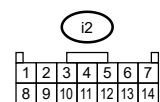
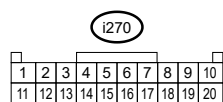
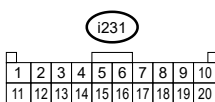
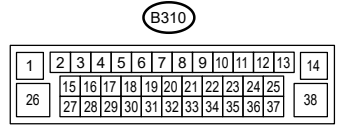
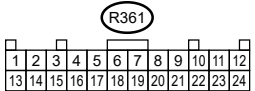
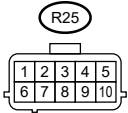
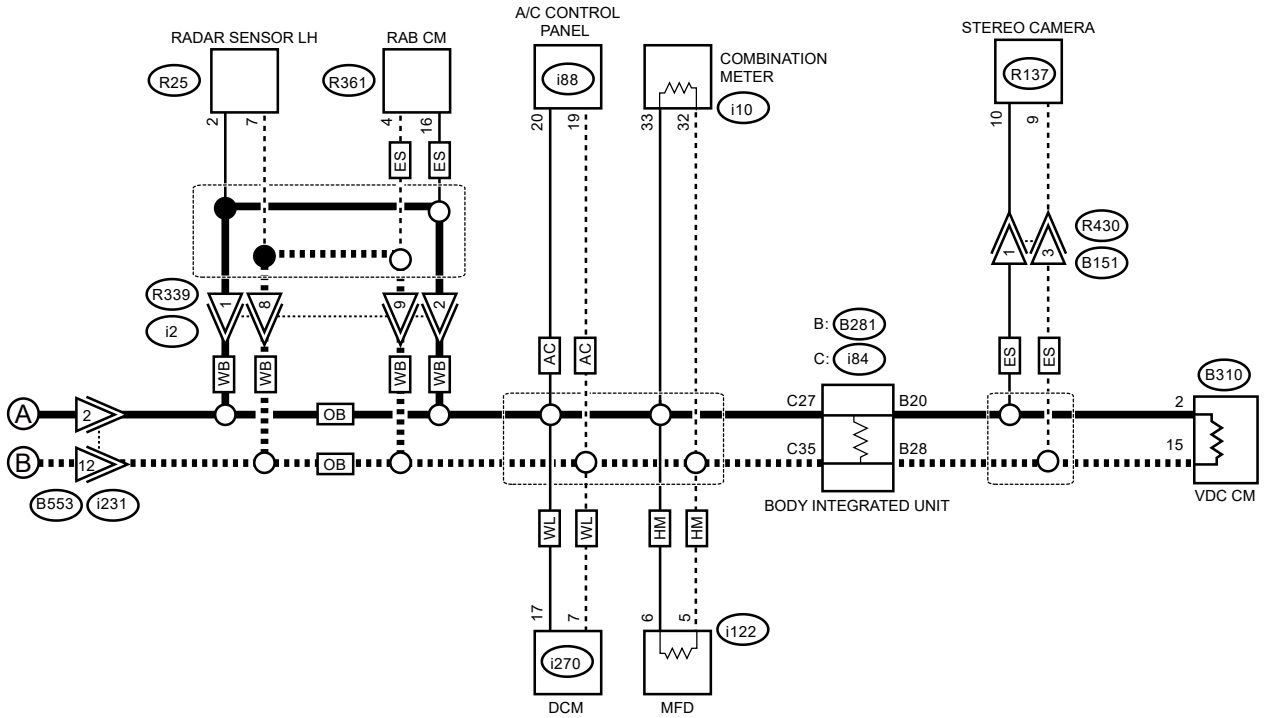
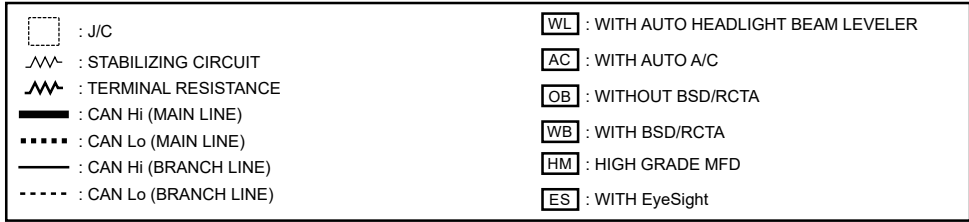
- Non-turbo model





LAN10779

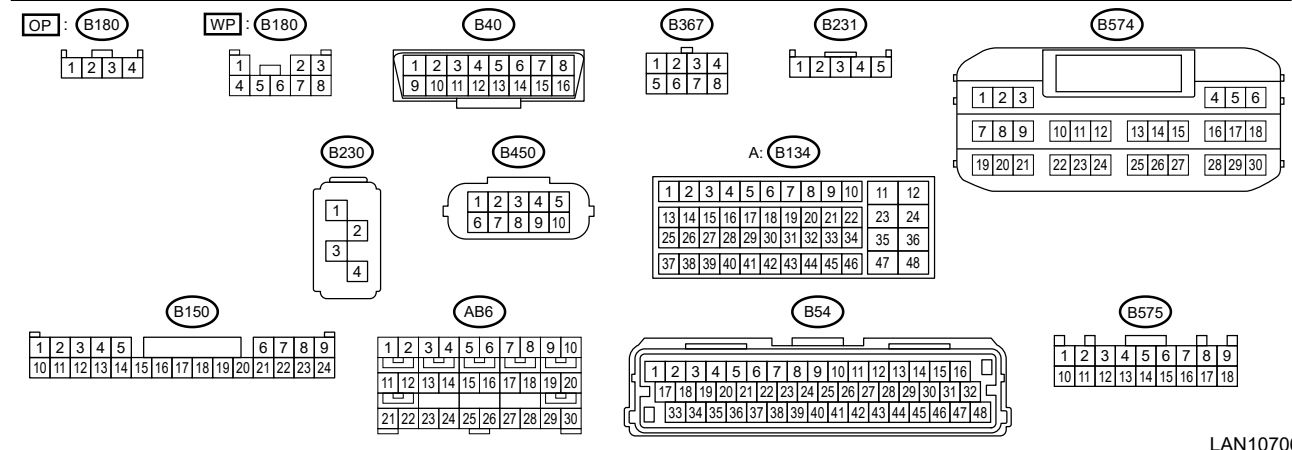
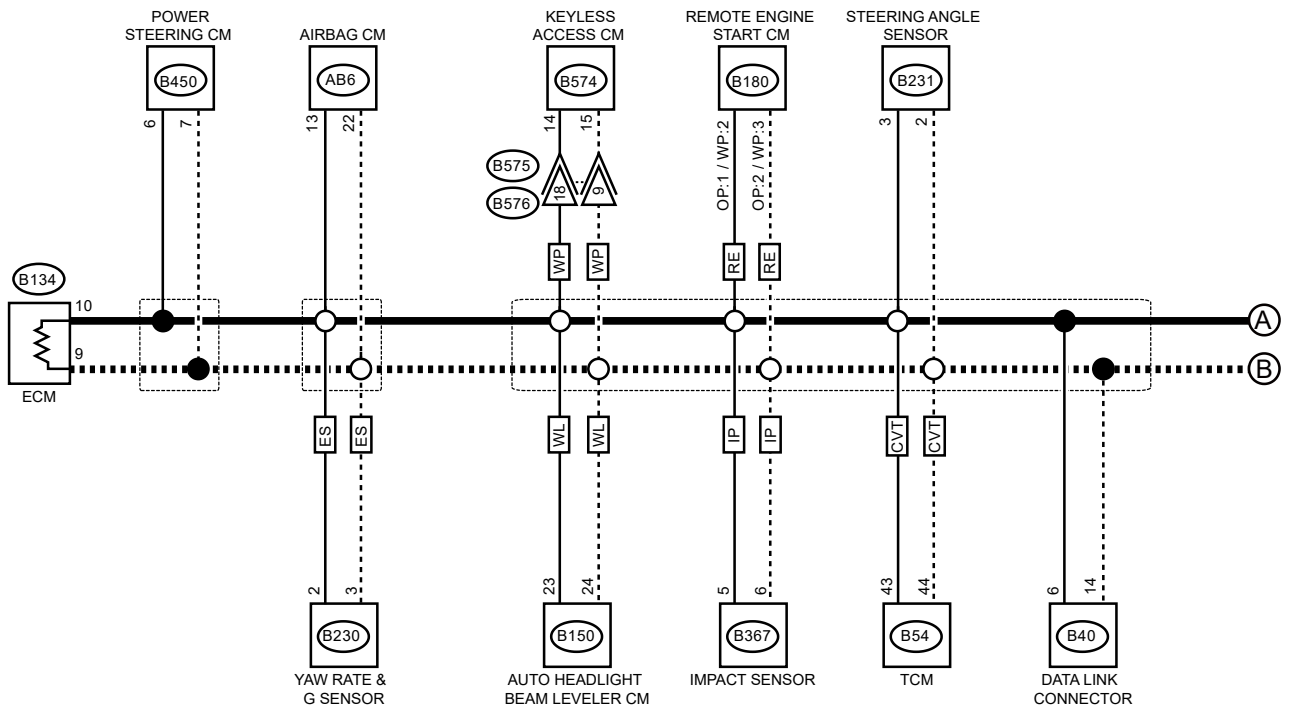
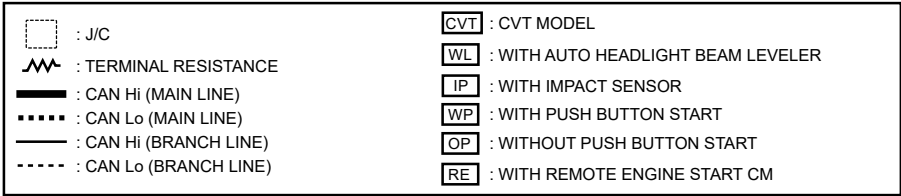




LAN10705

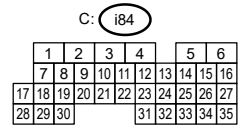
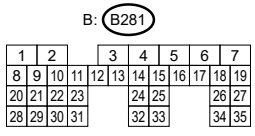
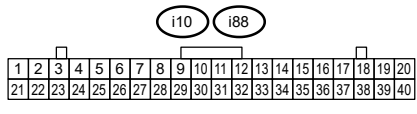
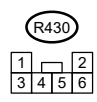
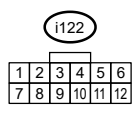
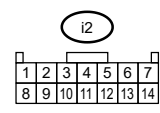
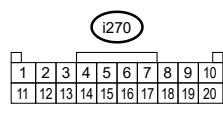
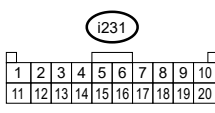
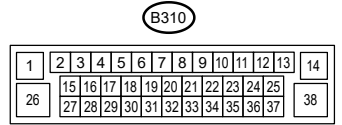
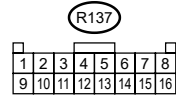
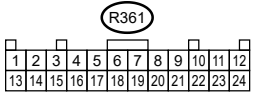
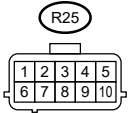
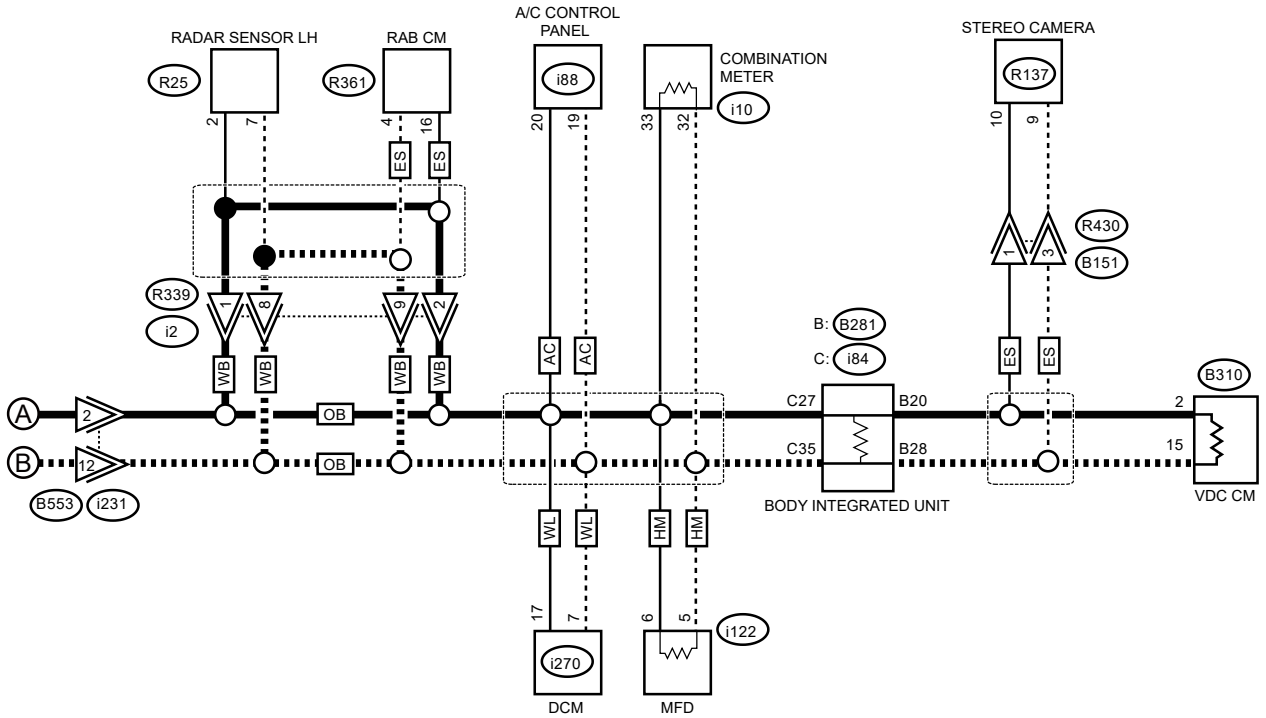
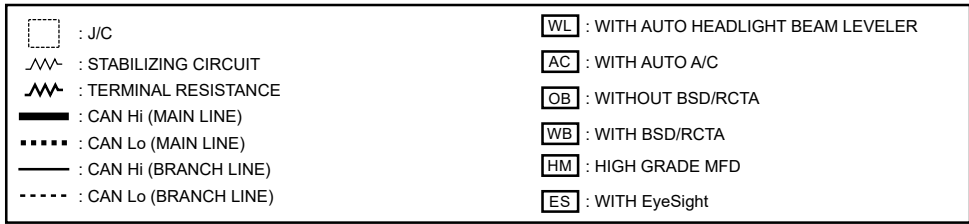
• Turbo model





LAN10706





LAN10705

1. CHECK BASIC DIAGNOSTIC PROCEDURE.



Check that the basic diagnosis has been performed up to step 8.

Note:


Possible defective parts can be narrowed easily by inspection using Subaru Select Monitor before performing "CHECK CAN COMMUNICATION CIRCUIT" using a tester.

Was the basic diagnostic procedure performed?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

2. CHECK FROM DATA LINK CONNECTOR.

Using the tester, measure the resistance between terminals.


Connector & terminal

(B40) No. 6 — Chassis ground:

(B40) No. 14 — Chassis ground:

Is the resistance 10 Ω or less?

Yes

Check for ground short.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check>INSPECTION > GROUND SHORT INSPECTION.](#)

No

 [Go to 3.](#)

3. CHECK FROM DATA LINK CONNECTOR.

1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between terminals.

Connector & terminal

(B40) No. 6 — Chassis ground:


(B40) No. 14 — Chassis ground:

Is the voltage 5 V or less?

Yes

 [Go to 4.](#)

No

Check for battery short.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check>INSPECTION > BATTERY SHORT INSPECTION.](#)

4. CHECK FROM DATA LINK CONNECTOR.


1. Turn the ignition switch to OFF.
2. Using the tester, measure the resistance between terminals.

Connector & terminal

(B40) No. 6 — No. 14:

Is the resistance 52 Ω or less?

Yes

Perform the inspection for resistance of 52 Ω or less.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check>INSPECTION > 52 \$\Omega\$ OR LESS.](#)

No

 [Go to 5.](#)

5. CHECK FROM DATA LINK CONNECTOR.




Using the tester, measure the resistance between terminals.

Connector & terminal


(B40) No. 6 — No. 14:

Is the resistance 62 Ω or more?

Yes

Perform the inspection for resistance of 62 Ω or more.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check>INSPECTION > 62 \$\Omega\$ OR MORE.](#)

No

If the display of CAN system U-code disappears from the current malfunction, the CAN network is currently normal. If the U-code has detected as current malfunction, related lines may be open. Perform the inspection for the related line corresponding to the detected DTC.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check>LIST.](#)

LAN SYSTEM (DIAGNOSTICS) > Check List for Interview

CHECK

Inspect the following items regarding the vehicle’s state.

1. DISPLAY STATUS IN THE COMBINATION METER



Display status in the combination meter	Engine coolant temperature gauge display	<input type="checkbox"/> Normal / <input type="checkbox"/> Abnormal
	Fuel gauge display	<input type="checkbox"/> Normal / <input type="checkbox"/> Abnormal
	Tachometer display	<input type="checkbox"/> Normal / <input type="checkbox"/> Abnormal (0 rpm at idling, etc.)
Display of other indicators	Malfunction indicator light	<input type="checkbox"/> ON / <input type="checkbox"/> Blink / <input type="checkbox"/> OFF
	Sport indicator light (AT warning light)	<input type="checkbox"/> ON / <input type="checkbox"/> Blink / <input type="checkbox"/> OFF
	ABS warning light	<input type="checkbox"/> ON / <input type="checkbox"/> Blink / <input type="checkbox"/> OFF
	VDC warning light	<input type="checkbox"/> ON / <input type="checkbox"/> Blink / <input type="checkbox"/> OFF
	Security indicator	<input type="checkbox"/> ON / <input type="checkbox"/> Blink / <input type="checkbox"/> OFF
	AT OIL TEMP warning light	<input type="checkbox"/> ON / <input type="checkbox"/> Blink / <input type="checkbox"/> OFF
	Engine coolant temperature warning light	<input type="checkbox"/> Blue light ON / <input type="checkbox"/> Red light ON / <input type="checkbox"/> Red light blinks / <input type="checkbox"/> Blue and red lights blink
	CRUISE indicator	<input type="checkbox"/> ON / <input type="checkbox"/> Blink / <input type="checkbox"/> OFF
	Shift indicator	<input type="checkbox"/> Normal / <input type="checkbox"/> Abnormal
	Fuel level warning light	<input type="checkbox"/> ON / <input type="checkbox"/> Blink / <input type="checkbox"/> OFF
	Airbag warning light	<input type="checkbox"/> ON / <input type="checkbox"/> Off
	VDC OFF indicator	<input type="checkbox"/> ON / <input type="checkbox"/> Off
	Brake warning light	<input type="checkbox"/> ON / <input type="checkbox"/> Off
	Auto Start Stop indicator	<input type="checkbox"/> ON / <input type="checkbox"/> Blink / <input type="checkbox"/> OFF
	EyeSight warning light	<input type="checkbox"/> ON / <input type="checkbox"/> Blink / <input type="checkbox"/> OFF
Lane departure warning OFF indicator light	<input type="checkbox"/> ON / <input type="checkbox"/> Off	
Pre-collision brake OFF indicator light	<input type="checkbox"/> ON / <input type="checkbox"/> Off	
Headlight beam leveler indicator	<input type="checkbox"/> ON / <input type="checkbox"/> Off	

2. CONDITIONS UNDER WHICH TROUBLE OCCURS



Driving condition	<input type="checkbox"/> At standstill (while idling)	
	<input type="checkbox"/> When the vehicle is running	Vehicle speed km/h (MPH)
	<input type="checkbox"/> While accelerating	Acceleration km/h (MPH) to km/h (MPH)
	<input type="checkbox"/> Decelerating (with	Deceleration km/h (MPH) to km/h (MPH)

braking)	
<input type="checkbox"/> Decelerating (without braking)	Deceleration km/h (MPH) to km/h (MPH)
<input type="checkbox"/> Flat road <input type="checkbox"/> Uphill <input type="checkbox"/> Downhill <input type="checkbox"/> Gravel road <input type="checkbox"/> Bumpy road <input type="checkbox"/> Snowy road	
Does it occur when operating any part? Operated part: Trouble symptom:	
Are there any other troubles occurred? From where: Trouble symptom:	

LAN SYSTEM (DIAGNOSTICS) > Clear memory

OPERATION














- 1.** On [Start] display, select [Diagnosis].
- 2.** On [Vehicle selection] display, input the target vehicle information and select [OK].
- 3.** On [Main Menu] display, select [All diagnosis code].
- 4.** On [All diagnosis code] display, select [Clear memory].




Note:

For detailed operation procedures, refer to "Application help".

LAN SYSTEM (DIAGNOSTICS) > Control Module I/O Signal


ELECTRICAL SPECIFICATION

- Body integrated unit
For I/O signals of the body integrated unit, refer to BODY CONTROL SYSTEM (DIAGNOSTICS).  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Control Module I/O Signal.](#)
- Engine CM
For I/O signals of ECM, refer to ENGINE (DIAGNOSTICS).  [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Engine Control Module \(ECM\) I/O Signal>ELECTRICAL SPECIFICATION.](#)
- Transmission CM
For I/O signals of TCM, refer to TRANSMISSION (DIAGNOSTICS).  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Transmission Control Module \(TCM\) I/O Signal.](#)
- VDC CM, steering angle sensor, yaw rate & G sensor
For the module I/O signals of VDC CM, steering angle sensor, and yaw rate & G sensor, refer to BRAKE CONTROL (DIAGNOSTICS).  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Control Module I/O Signal.](#)
- Power steering CM
For unit I/O signals of power steering CM, refer to POWER STEERING (DIAGNOSTICS).  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Control Module I/O Signal.](#)
- A/C control panel
For unit I/O signals of A/C control panel, refer to AIR CONDITIONER (DIAGNOSTICS).  [Ref. to AIR CONDITIONER\(DIAGNOSTICS\)>Auto A/C Control Module I/O Signal.](#)
- Combination meter
For I/O signals of combination meter, refer to COMBINATION METER (DIAGNOSTICS).  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Control Module I/O Signal.](#)
- Airbag CM
For I/O signals of the airbag CM, refer to AIRBAG SYSTEM (DIAGNOSTICS).  [Ref. to AIRBAG\(DIAGNOSTICS\)>Airbag Control Module I/O Signal.](#)
- High grade MFD
For I/O signals of high grade MFD, refer to MULTI-FUNCTION DISPLAY (DIAGNOSTICS).  [Ref. to MULTI-FUNCTION DISPLAY\(DIAGNOSTICS\)>Control Module I/O Signal.](#)
- Keyless access CM
For I/O signals of keyless access CM, refer to KEYLESS ACCESS WITH PUSH BUTTON START (DIAGNOSTICS).  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Control Module I/O Signal.](#)
- Stereo camera
For I/O signals of stereo camera, refer to EyeSight (Diagnostics).  [Ref. to EyeSight \(DIAGNOSTICS\)>Control Module I/O Signal.](#)
- Auto headlight beam leveler CM
For I/O signals of auto headlight beam leveler CM, refer to HEADLIGHT / FOGLIGHT (DIAGNOSTICS).  [Ref. to HEADLIGHT / FOGLIGHT\(DIAGNOSTICS\)>Control Module I/O Signal.](#)
- Data communication module (DCM)
For I/O signals of DCM, refer to TELEMATICS (DIAGNOSTICS).  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Control Module I/O Signal.](#)

- Radar sensor
For I/O signals of the radar sensor, refer to BSD/RCTA (DIAGNOSTICS).  [Ref. to Blind Spot Detection/Rear Cross Traffic Alert \(DIAGNOSTICS\)>Control Module I/O Signal.](#)
- RAB CM
For I/O signals of the RAB CM, refer to Reverse Automatic Braking (DIAGNOSTICS).  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Control Module I/O Signal.](#)
- Data link connector
For I/O signals of data link connector, refer to ENGINE (DIAGNOSTICS).  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Data Link Connector.](#)

LAN SYSTEM (DIAGNOSTICS) > Control Module I/O Signal

WIRING DIAGRAM

Refer to "CAN Communication System" in the wiring diagram.  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

DTC detecting condition:

Integrated unit communication is shut down because of high speed CAN error.

Trouble symptom:

CAN communication is not normal.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes


 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (CURRENT MALFUNCTION).

1. Start the engine.


2. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0073 a current malfunction?


Yes

 [Go to 3.](#)

No

It may be a temporary poor contact. Perform the clear memory operation.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

3. CHECK CAN COMMUNICATION CIRCUIT.

Check CAN communication circuit.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check>PROCEDURE.](#)

Is CAN communication circuit faulty?



Yes

Repair the faulty portion, following the diagnosis procedure.

No


 [Go to 4.](#)

4. CHECK DTC.

1. Perform the inspection using the DTC check sheet.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\)>LIST > CHECK USING THE DTC CHECK SHEET.](#)
2. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0073 a current malfunction?

Yes

 [Go to 5.](#)

No


System is normal.

5. CHECK CONTROL MODULE.

1. Turn the ignition switch to OFF.
2. Disconnect the control modules other than body integrated unit in order.

Note:

When disconnecting ECM or VDC CM, connect resistance of 120 Ω between CAN Hi and CAN Lo as an alternative of end resistance.

3. Turn the ignition switch to ON.
4. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is there any control module that U0073 is not detected as current malfunction?

Yes

Replace the control module.

No

Repeat 1) – 4) in step 3 until U0073 is not detected.

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

DTC detecting condition:

No data is received from ECM.

Trouble symptom:

Cooperation control of transmission may not operate properly.


1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (CURRENT MALFUNCTION).

Check the displayed DTC.

Is U0100 a current malfunction?

Yes

 [Go to 4.](#)

No

 [Go to 6.](#)

4. CHECK DTC (CURRENT MALFUNCTION).



1. Check CAN communication circuit. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check.](#)
2. Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0100 a current malfunction?

Yes

[Go to 5.](#)

No

[Go to 6.](#)

5. CHECK DTC.



Using the Subaru Select Monitor, read DTC of all the systems. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the engine data no-receive detected in several modules?

Yes

Replace the ECM. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Engine Control Module \(ECM\).](#)

No

Replace the module that the DTC has been detected.

6. CHECK HARNESS.



1. Shake the harness, and check for poor contact.
2. Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0100 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

[Go to 7.](#)

7. CHECK CONNECTOR.



Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.



[Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM

DTC detecting condition:

No data is received from TCM.

Trouble symptom:

Cooperation control with transmission is not performed.


1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.

 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

 [Go to 2.](#)

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Perform the diagnosis for DTCs other than the displayed U-code.

 [Go to 3.](#)

3. CHECK DTC (CURRENT MALFUNCTION).

Check the displayed DTC.

Is U0101 a current malfunction?

 [Go to 4.](#)

 [Go to 6.](#)

4. CHECK DTC (CURRENT MALFUNCTION).



1. Check CAN communication circuit. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check.](#)
2. Read the DTC using Subaru Select Monitor. [Go to 6.](#) [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0101 a current malfunction?

Yes

[Go to 5.](#)

No

[Go to 6.](#)

5. CHECK DTC.



Using the Subaru Select Monitor, read DTC of all the systems. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the transmission data no-receive detected in several modules?

Yes

Replace the TCM. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

Replace the module that the DTC has been detected.

6. CHECK HARNESS.



1. Shake the harness, and check for poor contact.
2. Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0101 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

[Go to 7.](#)

7. CHECK CONNECTOR.



Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.



[Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

DTC detecting condition:

No data from VDCCM is received.


Trouble symptom:

ABS warning light and VDC warning light illuminate.


1. CHECK CAN COMMUNICATION HARNESS.

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (CURRENT MALFUNCTION).


Check the displayed DTC.

Is U0122 a current malfunction?

Yes

 [Go to 4.](#)

No

 [Go to 6.](#)

4. CHECK DTC (CURRENT MALFUNCTION).



1. Check CAN communication circuit. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check.](#)
2. Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0122 a current malfunction?

Yes

[Go to 5.](#)

No

[Go to 6.](#)

5. CHECK DTC.



Using the Subaru Select Monitor, read DTC of all the systems.

Is the VDC data no-receive detected in several modules?

Yes

Replace the VDC CM. [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\).](#)

No

Replace the module that the DTC has been detected.

6. CHECK HARNESS.



1. Shake the harness, and check for poor contact.
2. Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0122 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

[Go to 7.](#)

7. CHECK CONNECTOR.



Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.

 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0123 LOST COMMUNICATION WITH YAW RATE SENSOR MODULE

DTC detecting condition:

No data from the yaw rate & G sensor is received.

Trouble symptom:

ABS warning light and VDC warning light illuminate.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No


 [Go to 3.](#)

3. CHECK DTC (CURRENT MALFUNCTION).

Check the displayed DTC.

Is U0123 a current malfunction?

Yes

 [Go to 4.](#)

No

 [Go to 6.](#)

4. CHECK DTC (CURRENT MALFUNCTION).



1. Check CAN communication circuit. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check.](#)
2. Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0123 a current malfunction?

Yes

[Go to 5.](#)

No

System is normal.

5. CHECK DTC.



Using the Subaru Select Monitor, read DTC of all the systems. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the yaw rate sensor data no-receive detected in several modules?

Yes

Replace the yaw rate & G sensor. [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Yaw Rate and G Sensor.](#)

No

Replace the module that the DTC has been detected.

6. CHECK HARNESS.



1. Shake the harness, and check for poor contact.
2. Read the DTC using Subaru Select Monitor.

Is U0123 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

[Go to 7.](#)

7. CHECK CONNECTOR.



Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0126 LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE

DTC detecting condition:

No data is received from steering angle sensor.

Trouble symptom:


VDC CM does not operate normally.

1. CHECK CAN COMMUNICATION HARNESS.


Perform the basic diagnostic procedure to check for fault in CAN communication harness.

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (CURRENT MALFUNCTION).

Check the displayed DTC.

Is U0126 a current malfunction?

Yes

 [Go to 4.](#)

No

 [Go to 6.](#)

4. CHECK DTC (CURRENT MALFUNCTION).



1. Check CAN communication circuit. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check.](#)
2. Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0126 a current malfunction?

Yes

[Go to 5.](#)

No

[Go to 6.](#)

5. CHECK DTC.



Using the Subaru Select Monitor, read DTC of all the systems. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the steering angle sensor data no-receive detected in several modules?

Yes

Replace the steering angle sensor. [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Steering Angle Sensor.](#)

No

Replace the module that the DTC has been detected.

6. CHECK HARNESS.



1. Shake the harness, and check for poor contact.
2. Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0126 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

[Go to 7.](#)

7. CHECK CONNECTOR.



Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.

 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0131 LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE

DTC detecting condition:

No data is received from power steering CM.

Trouble symptom:

Cooperation control with power steering CM does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.



Perform the basic diagnostic procedure to check for fault in CAN communication harness.

[Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

[Go to 2.](#)

No

Perform the basic diagnostic procedure. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).



Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

[Go to 3.](#)

3. CHECK DTC (CURRENT MALFUNCTION).



Check the displayed DTC.

Is U0131 a current malfunction?

Yes

[Go to 4.](#)

No

[Go to 6.](#)

4. CHECK DTC.



1. Check CAN communication circuit. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check.](#)
2. Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0131 a current malfunction?

Yes

[Go to 5.](#)

No

[Go to 6.](#)

5. CHECK DTC.



Using the Subaru Select Monitor, read DTC of all the systems. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the electric power steering data no-receive detected in several modules?

Yes

Replace the power steering CM. [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Power Steering Control Module.](#)

No

[Go to 6.](#)

6. CHECK HARNESS.



1. Shake the harness, and check for poor contact.
2. Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0131 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

[Go to 7.](#)

7. CHECK CONNECTOR.



Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.



[Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE

DTC detecting condition:

No data is received from body integrated unit.

Trouble symptom:

Cooperation control with body integrated unit does not operate properly.


1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (CURRENT MALFUNCTION).

Check the displayed DTC.

Is U0140 a current malfunction?

Yes

 [Go to 4.](#)

No

 [Go to 6.](#)

4. CHECK DTC.



1. Check CAN communication circuit. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check.](#)
2. Using the Subaru Select Monitor, read DTC of all the systems. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0140 a current malfunction?

Yes

[Go to 5.](#)

No

[Go to 4.](#)

5. CHECK DTC.



Using the Subaru Select Monitor, read DTC of all the systems. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the body integrated data no-receive detected in several modules?

Yes

Replace the body integrated unit. [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

No

Replace the module that the DTC has been detected.

6. CHECK HARNESS.



1. Shake the harness, and check for poor contact.
2. Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0140 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

[Go to 7.](#)

7. CHECK CONNECTOR.



Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.



[Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0151 LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE

DTC detecting condition:

No data is received from A/B CM.

Trouble symptom:

Cooperation control with A/B CM does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (CURRENT MALFUNCTION).

Check the displayed DTC.

Is U0151 a current malfunction?

Yes

 [Go to 4.](#)

No

 [Go to 6.](#)

4. CHECK DTC (CURRENT MALFUNCTION).



1. Check CAN communication circuit. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check.](#)
2. Using the Subaru Select Monitor, read DTC of all the systems. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0151 a current malfunction?

Yes

[Go to 5.](#)

No

[Go to 6.](#)

5. CHECK DTC.



Using the Subaru Select Monitor, read DTC of all the systems. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the airbag data no-receive detected in several modules?

Yes

Replace the A/B CM. [Ref. to AIRBAG SYSTEM>Airbag Control Module.](#)

No

Replace the module that the DTC has been detected.

6. CHECK HARNESS.



1. Shake the harness, and check for poor contact.
2. Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0151 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

[Go to 7.](#)

7. CHECK CONNECTOR.



Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.

 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

DTC detecting condition:

No data is received from combination meter.

Trouble symptom:

Display of combination meter does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (CURRENT MALFUNCTION).


Check the displayed DTC.

Is U0155 a current malfunction?

Yes



 [Go to 4.](#)

No

 [Go to 6.](#)


No

4. CHECK DTC (CURRENT MALFUNCTION).

1. Check CAN communication circuit.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check.](#)
2. Using the Subaru Select Monitor, read DTC of all the systems.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0155 a current malfunction?


Yes

 [Go to 5.](#)

No

 [Go to 6.](#)

5. CHECK DTC.

Using the Subaru Select Monitor, read DTC of all the systems.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the meter data no-receive detected in several modules?


Yes

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

No

Replace the module that the DTC has been detected.

6. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Read the DTC using Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0155 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

 [Go to 7.](#)

7. CHECK CONNECTOR.



Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.

 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0156 LOST COMMUNICATION WITH INFORMATION CENTER "A"

DTC detecting condition:

No data is received from MFD.

Trouble symptom:


Display of MFD does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.


Perform the basic diagnostic procedure to check for fault in CAN communication harness.

 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (CURRENT MALFUNCTION).

Check the displayed DTC.

Is U0156 a current malfunction?

Yes

 [Go to 4.](#)

No

 [Go to 6.](#)

4. CHECK DTC (CURRENT MALFUNCTION).



1. Check CAN communication circuit. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check.](#)
2. Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0156 a current malfunction?

Yes

[Go to 5.](#)

No

[Go to 6.](#)

5. CHECK DTC.



Using the Subaru Select Monitor, read DTC of all the systems. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the MFD data no-receive detected in several modules?

Yes

Replace the MFD. [Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display_\(MFD\).](#)

No

Replace the module that the DTC has been detected.

6. CHECK HARNESS.



1. Shake the harness, and check for poor contact.
2. Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0156 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

[Go to 7.](#)

7. CHECK CONNECTOR.



Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.

 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0164 LOST COMMUNICATION WITH HVAC CONTROL MODULE

No data is received from A/C control panel.

DTC detecting condition:

Trouble symptom:

Cooperation control of air conditioner does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.


Perform the basic diagnostic procedure to check for fault in CAN communication harness.

 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Yes

 [Go to 1.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (CURRENT MALFUNCTION).

Check the displayed DTC.

Is U0164 a current malfunction?

Yes

 [Go to 4.](#)

No

 [Go to 6.](#)

4. CHECK DTC (CURRENT MALFUNCTION).

1. Check CAN communication circuit. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check.](#)
2. Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0164 a current malfunction?

Yes

[Go to 5.](#)

No

[Go to 6.](#)

5. CHECK DTC.

Using the Subaru Select Monitor, read DTC of all the systems.

Is the air conditioner data no-receive detected in several modules?

Yes

Replace the A/C control panel. [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel.](#)

No

Replace the module that the DTC has been detected.

6. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0164 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

[Go to 7.](#)

7. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.

 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0181 LOST COMMUNICATION WITH HEADLAMP LEVELING CONTROL MODULE

DTC detecting condition:

No data is received from auto headlight beam leveler CM.

Trouble symptom:

The auto headlight beam leveler does not operate normally.


1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (CURRENT MALFUNCTION).

Check the displayed DTC.

Is U0181 a current malfunction?

Yes

 [Go to 4.](#)

No

 [Go to 6.](#)

4. CHECK DTC (CURRENT MALFUNCTION).



1. Check CAN communication circuit. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check.](#)
2. Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0181 a current malfunction?

Yes

[Go to 5.](#)

No

[Go to 6.](#)

5. CHECK DTC.



Using the Subaru Select Monitor, read DTC of all the systems. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the auto headlight beam leveler data no-receive detected in several modules?

Yes

Replace the auto headlight beam leveler CM. [Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.](#)

No

Replace the module that the DTC has been detected.

6. CHECK HARNESS.



1. Shake the harness, and check for poor contact.
2. Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0181 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

[Go to 7.](#)

7. CHECK CONNECTOR.



Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.

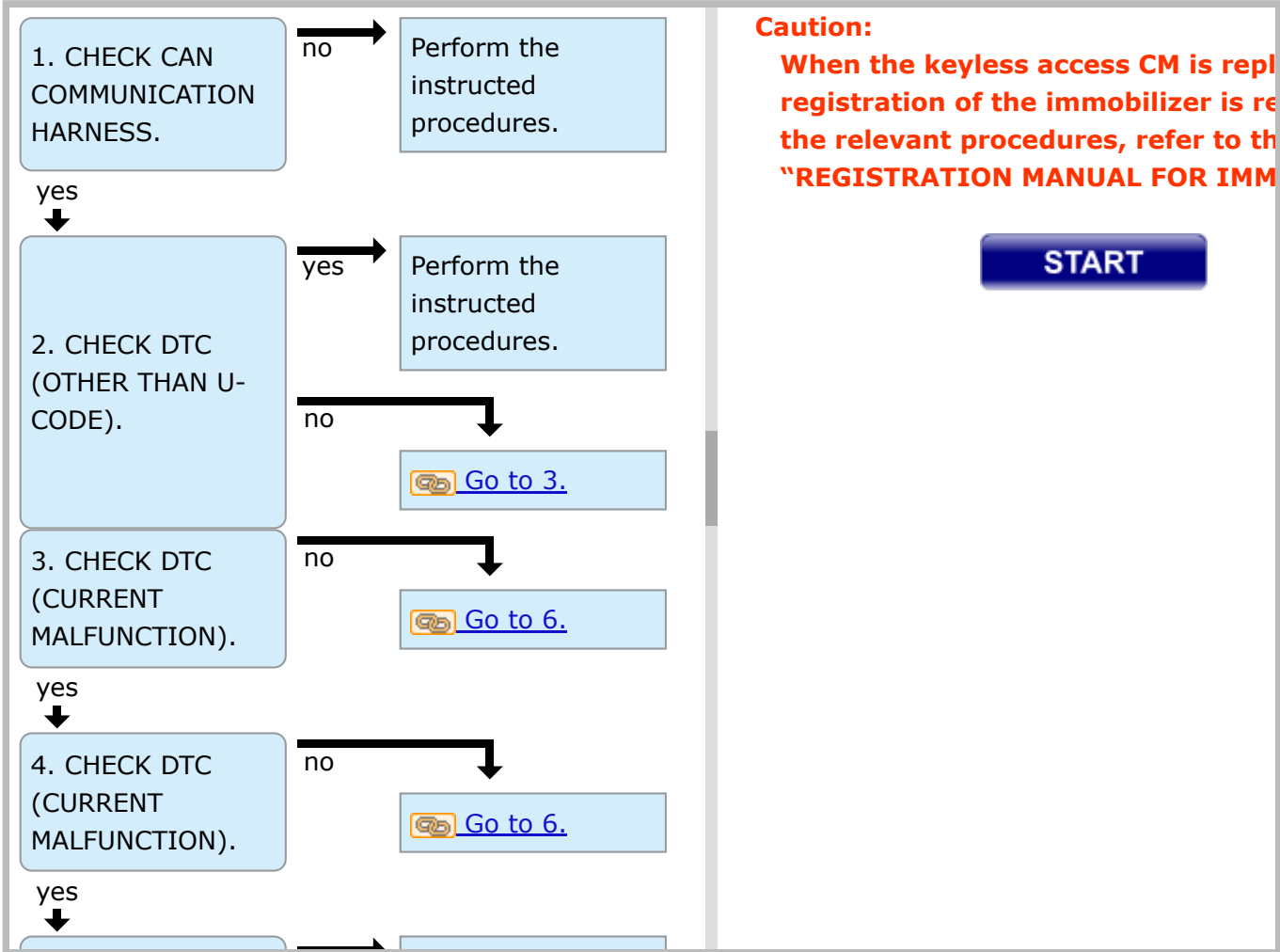


[Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0327 SOFTWARE INCOMPATIBILITY WITH VEHICLE SECURITY CONTROL MODULE

CAUTION/NOTE INTRO



LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"

DTC detecting condition:

Defective data from ECM.

Trouble symptom:

Defective data on CAN communication occurs.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed?

Yes

Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.

No


 [Go to 4.](#)

4. CHECK DTC (CURRENT MALFUNCTION).


Check the displayed DTC.

Is U0401 a current malfunction?


Yes

 [Go to 5.](#)

No

 [Go to 7.](#)

5. CHECK DTC (CURRENT MALFUNCTION).

1. Turn the ignition switch to OFF.
2. Disconnect the ECM connector.
3. Connect the disconnected connectors.
4. Read the DTC using Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0401 a current malfunction?


Yes

 [Go to 6.](#)

No


 [Go to 7.](#)

6. CHECK DTC.

Using the Subaru Select Monitor, read DTC of all the systems.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the engine data abnormal detected in several modules?


Yes

Replace the ECM.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DO\)>Engine Control Module \(ECM\).](#)

No

Replace the module that the DTC has been detected.

7. CHECK HARNESS.


1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0401 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

 [Go to 8.](#)

8. CHECK CONNECTOR.




Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.
 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0402 INVALID DATA RECEIVED FROM TCM

DTC detecting condition:

Received error data from TCM.

Trouble symptom:

Sport indicator light blinks.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed?

Yes

Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.

No

 [Go to 4.](#)

4. CHECK DTC (CURRENT MALFUNCTION).



Check the displayed DTC.

Is U0402 a current malfunction?

Yes

[Go to 5.](#)

No

[Go to 7.](#)

5. CHECK DTC (CURRENT MALFUNCTION).



1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Connect the disconnected connectors.
4. Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0402 a current malfunction?

Yes

[Go to 6.](#)

No

[Go to 7.](#)

6. CHECK DTC.



Using the Subaru Select Monitor, read DTC of all the systems. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the transmission data abnormal detected in several modules?

Yes


Replace the TCM. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

Replace the module that the DTC has been detected.

7. CHECK HARNESS.



1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0402 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

 [Go to 8.](#)

8. CHECK CONNECTOR.




Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.
 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

DTC detecting condition:

Data from VDCCM is faulty.

Trouble symptom:

ABS warning light and VDC warning light illuminate.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 8.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed?

Yes

Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.

No

 [Go to 4.](#)

4. CHECK DTC (CURRENT MALFUNCTION).

Check the displayed DTC.

Is U0416 a current malfunction?


Yes

 [Go to 5.](#)

No

 [Go to 7.](#)

5. CHECK DTC (CURRENT MALFUNCTION).

1. Turn the ignition switch to OFF.
2. Disconnect the VDC CM connector.
3. Connect the disconnected connectors.
4. Read the DTC using Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0416 a current malfunction?


Yes

 [Go to 6.](#)

No


 [Go to 7.](#)

6. CHECK DTC.

Using the Subaru Select Monitor, read DTC of all the systems.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the VDC data abnormal detected in several modules?


Yes

Replace the VDC CM.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>VDC Control Module and Hydraulic Control Unit \(VDCCM&H/U\).](#)

No

Replace the module that the DTC has been detected.

7. CHECK HARNESS.


1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0416 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

 [Go to 8.](#)

8. CHECK CONNECTOR.




Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.
 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0420 INVALID DATA RECEIVED FROM POWER STEERING CONTROL MODULE

DTC detecting condition:

Defective data was transmitted from EPS CM.

Trouble symptom:

Cooperation control with EPS CM does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed?

Yes

Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.

No


 [Go to 4.](#)

4. CHECK DTC (CURRENT MALFUNCTION).


Check the displayed DTC.

Is U0420 a current malfunction?


Yes

 [Go to 5.](#)

No

 [Go to 7.](#)

5. CHECK DTC (CURRENT MALFUNCTION).

1. Turn the ignition switch to OFF.
2. Disconnect the power steering CM connector.
3. Connect the disconnected connectors.
4. Read the DTC using Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0420 a current malfunction?


Yes

 [Go to 6.](#)

No

 [Go to 7.](#)

6. CHECK DTC.

Using the Subaru Select Monitor, read DTC of all the systems.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the electric power steering data abnormal detected in several modules?


Yes

Replace the power steering CM.  [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Power Steering Control Module.](#)

No

Replace the module that the DTC has been detected.

7. CHECK HARNESS.


1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0420 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

 [Go to 8.](#)

8. CHECK CONNECTOR.




Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.
 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE

DTC detecting condition:

Defective data was transmitted from body integrated unit.

Trouble symptom:

Cooperation control with body integrated unit does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed?

Yes

Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.

No


 [Go to 4.](#)

4. CHECK DTC (CURRENT MALFUNCTION).


Check the displayed DTC.

Is U0422 a current malfunction?


Yes

 [Go to 5.](#)

No


 [Go to 7.](#)

5. CHECK DTC (CURRENT MALFUNCTION).

1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector.
3. Connect the disconnected connectors.
4. Read the DTC using Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0422 a current malfunction?


Yes

 [Go to 6.](#)

No


 [Go to 7.](#)

6. CHECK DTC.

Using the Subaru Select Monitor, read DTC of all the systems.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the body integrated data abnormal detected in several modules?


Yes

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

No

 [Go to 7.](#)

7. CHECK HARNESS.


1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0422 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

 [Go to 8.](#)

8. CHECK CONNECTOR.




Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.
 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE

DTC detecting condition:

Defective data was transmitted from combination meter.

Trouble symptom:

Display of combination meter does not operate properly.


1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (U-CODE).


Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed?

Yes

Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.

No

 [Go to 4.](#)

4. CHECK DTC (CURRENT MALFUNCTION).

Check the displayed DTC.

Is U0423 a current malfunction?


Yes

 [Go to 5.](#)

No

 [Go to 7.](#)

5. CHECK DTC (CURRENT MALFUNCTION).

1. Turn the ignition switch to OFF.
2. Disconnect the combination meter connector.
3. Connect the disconnected connectors.
4. Read the DTC using Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0423 a current malfunction?


Yes

 [Go to 6.](#)

No

 [Go to 7.](#)

6. CHECK DTC.

Using the Subaru Select Monitor, read DTC of all the systems.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the meter data abnormal detected in several modules?

Yes


Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

No

Replace the module that the DTC has been detected.

7. CHECK HARNESS.




1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0423 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

 [Go to 7.](#)

8. CHECK CONNECTOR.




Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.
 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0424 INVALID DATA RECEIVED FROM HVAC CONTROL MODULE

DTC detecting condition:

Defective data was transmitted from A/C control panel.

Trouble symptom:

Cooperation control of air conditioner does not operate properly.


1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed?

Yes

Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.

No


 [Go to 4.](#)

4. CHECK DTC (CURRENT MALFUNCTION).


Check the displayed DTC.

Is U0424 a current malfunction?


Yes

 [Go to 6.](#)

No

 [Go to 7.](#)

5. CHECK DTC (CURRENT MALFUNCTION).

1. Turn the ignition switch to OFF.
2. Disconnect the A/C control panel connector.
3. Connect the disconnected connectors.
4. Read the DTC using Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0424 a current malfunction?


Yes

 [Go to 6.](#)

No

 [Go to 7.](#)

6. CHECK DTC.

Using the Subaru Select Monitor, read DTC of all the systems.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the air conditioner data abnormal detected in several modules?


Yes

Replace the A/C control panel.  [Ref. to HVAC SYSTEM \(HEATER, VENTILATOR AND A/C\)>Control Panel.](#)

No

Replace the module that the DTC has been detected.

7. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Read the DTC using Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0424 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

 [Go to 7.](#)

8. CHECK CONNECTOR.




Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.
 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0427 INVALID DATA RECEIVED FROM VEHICLE SECURITY CONTROL MODULE

DTC detecting condition:

Defective data was transmitted from keyless access CM.

Trouble symptom:

Cooperation control of keyless access does not operate properly.

Caution:

When the keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER".

1. CHECK PERFORMING OF BASIC DIAGNOSTIC PROCEDURE.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (U-CODE).

Check the displayed DTC.


Is DTC for the bus off or the data no-receive displayed?



Yes

Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.

No

 [Go to 4.](#)


4. CHECK DTC (CURRENT MALFUNCTION).



Check the displayed DTC.

Is U0427 a current malfunction?

Yes


 [Go to 5.](#)

No

 [Go to 7.](#)

5. CHECK DTC (CURRENT MALFUNCTION).



1. Turn the ignition switch to OFF.
2. Disconnect the keyless access CM connector.
3. Connect the disconnected connectors.
4. Read the DTC using Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0427 a current malfunction?

Yes


 [Go to 6.](#)

No

 [Go to 7.](#)


6. CHECK DTC.



Using the Subaru Select Monitor, read DTC of all the systems.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the smart data abnormal detected in several modules?

Yes


Replace the keyless access CM.  [Ref. to SECURITY AND LOCKS>Keyless Access CM.](#)

No

Replace the module that the DTC has been detected.

7. CHECK HARNESS.



1. Shake the harness, and check for poor contact.
2. Read the DTC using Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0427 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

 [Go to 8.](#)

8. CHECK CONNECTOR.




Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.
 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0428 INVALID DATA RECEIVED FROM STEERING ANGLE SENSOR MODULE

DTC detecting condition:

Defective data was transmitted from steering angle sensor.

Trouble symptom:

VDC CM does not operate normally.

1. CHECK PERFORMING OF BASIC DIAGNOSTIC PROCEDURE.



Perform the basic diagnostic procedure to check for fault in CAN communication harness.

[Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

[Go to 2.](#)

No

Perform the basic diagnostic procedure. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).



Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

[Go to 3.](#)

3. CHECK DTC (U-CODE).



Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed?

Yes

Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.

No

[Go to 4.](#)


4. CHECK DTC (CURRENT MALFUNCTION).




Check the displayed DTC.

Is U0428 a current malfunction?

Yes


 [Go to 5.](#)

No

 [Go to 7.](#)

5. CHECK DTC (CURRENT MALFUNCTION).



1. Turn the ignition switch to OFF.
2. Disconnect the steering angle sensor connector.
3. Connect the disconnected connectors.
4. Read the DTC using Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0428 a current malfunction?

Yes


 [Go to 6.](#)

No

 [Go to 7.](#)


6. CHECK DTC.



Using the Subaru Select Monitor, read DTC of all the systems.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the steering angle sensor data abnormal detected in several modules?

Yes


Replace the steering angle sensor.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Steering Angle Sensor.](#)

No

Replace the module that the DTC has been detected.

7. CHECK HARNESS.




1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0428 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

 [Go to 8.](#)

8. CHECK CONNECTOR.




Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.
 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0452 INVALID DATA RECEIVED FROM RESTRAINTS CONTROL MODULE

DTC detecting condition:

Invalid data was transmitted from airbag CM.

Trouble symptom:

Cooperation control with airbag does not operate properly.


1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed?

Yes

Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.

No


 [Go to 4.](#)

4. CHECK DTC (CURRENT MALFUNCTION).


Check the displayed DTC.

Is U0452 a current malfunction?


Yes

 [Go to 5.](#)

No


 [Go to 7.](#)

5. CHECK DTC.


1. Turn the ignition switch to OFF.
2. Disconnect the airbag CM connector.
3. Connect the disconnected connectors.
4. Read the DTC using Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0452 a current malfunction?


Yes

 [Go to 6.](#)

No

 [Go to 7.](#)

6. CHECK DTC.

Using the Subaru Select Monitor, read DTC of all the systems.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the airbag data abnormal detected in several modules?


Yes

Replace the airbag CM.  [Ref. to AIRBAG SYSTEM>Airbag Control Module.](#)

No

Replace the module that the DTC has been detected.

7. CHECK HARNESS.


1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0452 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

 [Go to 8.](#)

8. CHECK CONNECTOR.



Check the connector used for high speed CAN for poor contact.


Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.

 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0457 INVALID DATA RECEIVED FROM INFORMATION CENTER "A"

DTC detecting condition:

Defective data was transmitted from MFD.

Trouble symptom:

MFD does not operate normally.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed?

Yes

Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.

No


 [Go to 3.](#)

4. CHECK DTC (CURRENT MALFUNCTION).


Check the displayed DTC.

Is U0457 a current malfunction?


Yes

 [Go to 5.](#)

No

 [Go to 7.](#)

5. CHECK DTC (CURRENT MALFUNCTION).

1. Turn the ignition switch to OFF.
2. Disconnect the MFD connector.
3. Connect the disconnected connectors.
4. Read the DTC using Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0457 a current malfunction?


Yes

 [Go to 6.](#)

No


 [Go to 7.](#)

6. CHECK DTC.

Using the Subaru Select Monitor, read DTC of all the systems.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the MFD invalid data detected in several modules?


Yes

Replace the MFD.  [Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display \(MFD\).](#)

No

Replace the module that the DTC has been detected.

7. CHECK HARNESS.


1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0457 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

 [Go to 8.](#)

8. CHECK CONNECTOR.




Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.
 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0482 INVALID DATA RECEIVED FROM HEADLAMP LEVELING CONTROL MODULE

DTC detecting condition:

Invalid data was transmitted from auto headlight beam leveler CM.

Trouble symptom:

The auto headlight beam leveler does not operate normally.

1. CHECK PERFORMING OF BASIC DIAGNOSTIC PROCEDURE.



Perform the basic diagnostic procedure to check for fault in CAN communication harness.

[Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

[Go to 2.](#)

No

Perform the basic diagnostic procedure. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).



Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

[Go to 3.](#)

3. CHECK DTC (U-CODE).



Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed?

Yes

Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.

No

[Go to 4.](#)

4. CHECK DTC (CURRENT MALFUNCTION).

Check the displayed DTC.

Is U0482 a current malfunction?


Yes

 [Go to 5.](#)

No

 [Go to 7.](#)

5. CHECK DTC (CURRENT MALFUNCTION).

1. Turn the ignition switch to OFF.
2. Disconnect the auto headlight beam leveler CM connector.
3. Connect the disconnected connectors.
4. Read the DTC using Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0482 a current malfunction?


Yes

 [Go to 6.](#)

No


 [Go to 7.](#)

6. CHECK DTC.

Using the Subaru Select Monitor, read DTC of all the systems.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the auto headlight beam leveler data abnormal detected in several modules?


Yes

Replace the auto headlight beam leveler CM.  [Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.](#)

No

Replace the module that the DTC has been detected.

7. CHECK HARNESS.


1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0482 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

 [Go to 8.](#)

8. CHECK CONNECTOR.




Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.
 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0513 INVALID DATA RECEIVED FROM YAW RATE SENSOR MODULE

DTC detecting condition:

Invalid data was transmitted from yaw rate & G sensor.

Trouble symptom:

VDC control does not operate normally.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed?

Yes

Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.

No


 [Go to 4.](#)

4. CHECK DTC (CURRENT MALFUNCTION).

Check the displayed DTC.

Is U0513 a current malfunction?


Yes

 [Go to 5.](#)

No

 [Go to 7.](#)

5. CHECK DTC (CURRENT MALFUNCTION).

1. Turn the ignition switch to OFF.
2. Disconnect the yaw rate & G sensor connector.
3. Connect the disconnected connectors.
4. Read the DTC using Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0513 a current malfunction?


Yes

 [Go to 5.](#)

No


 [Go to 8.](#)

6. CHECK DTC.

Using the Subaru Select Monitor, read DTC of all the systems.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the yaw rate sensor invalid data detected in several modules?


Yes

Replace the yaw rate & G sensor.  [Ref. to VEHICLE DYNAMICS CONTROL \(VDC\)>Yaw Rate and G Sensor.](#)

No

Replace the module that the DTC has been detected.

7. CHECK HARNESS.


1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0513 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

 [Go to 8.](#)

8. CHECK CONNECTOR.




Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.
 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1073 CONTROL MODULE COMMUNICATION BUS "SONAR-CAN" OFF

DTC detecting condition:

Integrated unit communication is shut down because of high speed CAN error.

Trouble symptom:

CAN communication is not normal.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes


 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (CURRENT MALFUNCTION).

1. Start the engine.


2. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U1073 a current malfunction?


Yes

 [Go to 3.](#)

No

It may be a temporary poor contact. Perform the clear memory.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

3. CHECK CAN COMMUNICATION CIRCUIT.

Check CAN communication circuit.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check>PROCEDURE.](#)


Is CAN communication circuit faulty?





Yes

Repair the faulty portion, following the diagnosis procedure.

No


 [Go to 4.](#)

4. CHECK DTC.

1. Perform the inspection using the DTC check sheet.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\)>LIST > CHECK USING THE DTC CHECK SHEET.](#)
2. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U1073 a current malfunction?

Yes

 [Go to 4.](#)

No


System is normal.

5. CHECK CONTROL MODULE.

1. Turn the ignition switch to OFF.
2. Disconnect the control modules other than body integrated unit in order.

Note:

When disconnecting ECM or VDC CM, connect resistance of 120 Ω between CAN Hi and CAN Lo as an alternative of end resistance.

3. Turn the ignition switch to ON.
4. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is there any control module that U1073 is not detected as a current malfunction?

Yes

Replace the control module.

No

Repeat 1) – 4) in step 3 until U1073 is not detected.

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1201 CAN-HS COUNTER ABNORMAL

DTC detecting condition:

Communication is unstable because of high speed CAN communication error.

Trouble symptom:

- Display of combination meter indicates faulty.
- Control faulty may occur due to CAN communication error.


1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?


Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK CAN COMMUNICATION CIRCUIT.

Check CAN communication circuit.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check.](#)

Is CAN communication circuit faulty?


Yes

Repair the faulty portion, following the diagnosis procedure.

No


 [Go to 3.](#)

3. CHECK DTC (BUS OFF).


1. Start the engine.
2. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U0073 a current malfunction?

Yes

Perform the diagnosis of U0073.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.](#)

No

 [Go to 4.](#)

4. CHECK DTC (CURRENT MALFUNCTION).




Check the displayed DTC.

Is U1201 a current malfunction?

Yes


 [Go to 5.](#)

No

It is possible that temporary poor communication occurs. Perform the clear memory.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

5. CHECK DTC (CURRENT MALFUNCTION).




1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U1201 a current malfunction?

Yes

 [Go to 6.](#)

No

It is possible that temporary poor communication occurs. Perform the clear memory.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)


6. CHECK CONTROL MODULE.



1. Turn the ignition switch to OFF.
2. Disconnect the control modules other than body integrated unit in order.

Note:

When disconnecting ECM or VDC CM, connect resistance of 120 Ω between CAN Hi and CAN Lo as an alternative of end resistance.

3. Turn the ignition switch to ON.
4. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is there any control module that U1201 is not detected as current malfunction?

Yes

Replace the control module.

No

Repeat 1) – 4) in step 5 until U1201 is not detected.

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1232 LOST COMMUNICATION WITH REAR/SIDE RADAR CONTROL MODULE

DTC detecting condition:

No data is received from radar sensor.

Trouble symptom:

Cooperation control of radar sensor does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (CURRENT MALFUNCTION).

Check the displayed DTC.

Is U1232 a current malfunction?

Yes

 [Go to 4.](#)

No

 [Go to 6.](#)

4. CHECK DTC (CURRENT MALFUNCTION).



1. Check CAN communication circuit. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check.](#)
2. Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U1232 a current malfunction?

Yes

[Go to 5.](#)

No

[Go to 6.](#)

5. CHECK DTC.



Using the Subaru Select Monitor, read DTC of all the systems. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the Blind Spot Detection/Rear Cross Traffic Alert data no-receive detected in several modules?

Yes

Replace the radar sensor LH.

No

Replace the module that the DTC has been detected.

6. CHECK HARNESS.



1. Shake the harness, and check for poor contact.
2. Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U1232 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

[Go to 7.](#)

7. CHECK CONNECTOR.



Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

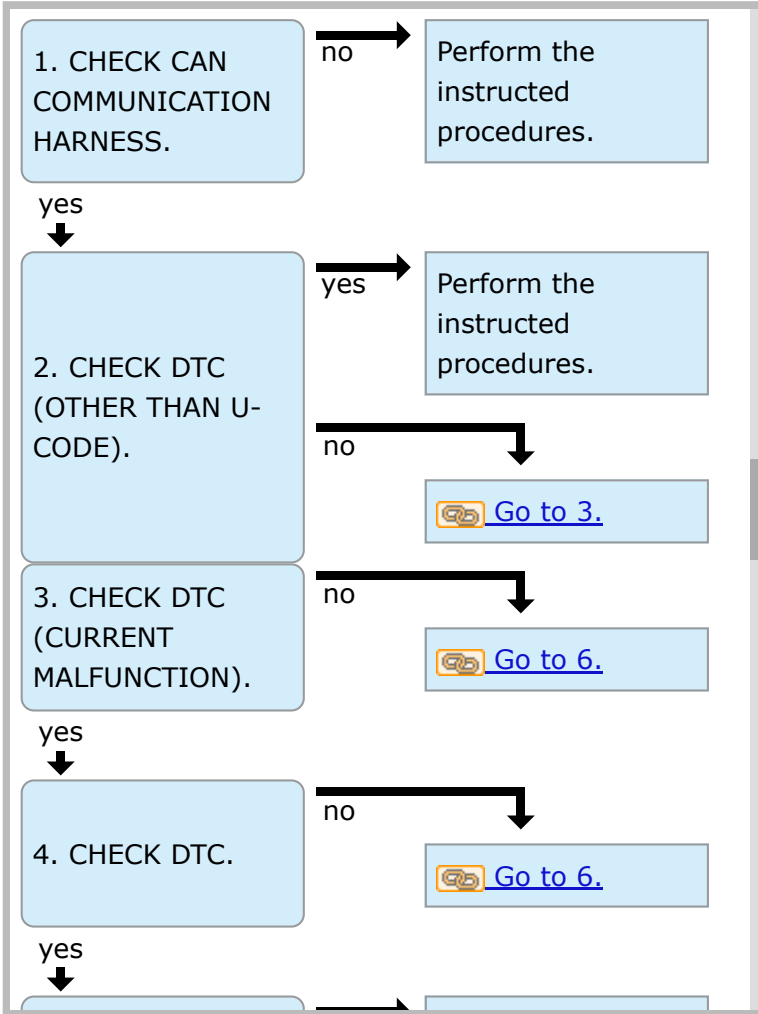
It is possible that temporary poor communication occurs. Delete the DTC.

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1233 LOST COMMUNICATION WITH RAB CONTROL MODULE

CAUTION/NOTE

INTRO



Caution:
When the keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMM"

START

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1235 LOST COMMUNICATION WITH EYESIGHT

DTC detecting condition:

No data from stereo camera is received.

Trouble symptom:

Cooperation control of EyeSight does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (CURRENT MALFUNCTION).

Check the displayed DTC.

Is U1235 a current malfunction?

Yes

 [Go to 4.](#)

No

 [Go to 6.](#)

4. CHECK DTC (CURRENT MALFUNCTION).

Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U1235 a current malfunction?

Yes

[Go to 5.](#)

No

[Go to 6.](#)

5. CHECK DTC.

Using the Subaru Select Monitor, read DTC of all the systems. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the EyeSight data no-receive detected in several modules?

Yes

Replace the stereo camera. [Ref. to EyeSight>Stereo Camera.](#)

No

Replace the module that the DTC has been detected.

6. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Read the DTC using Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U1235 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

[Go to 7.](#)

7. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.

 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1433 INVALID DATA RECEIVED FROM EYESIGHT

DTC detecting condition:

Defective data was transmitted from stereo camera.

Trouble symptom:

Cooperation control of EyeSight does not operate properly.

1. CHECK PERFORMING OF BASIC DIAGNOSTIC PROCEDURE.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed?

Yes

Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.

No


 [Go to 4.](#)

4. CHECK DTC (CURRENT MALFUNCTION).

Check the displayed DTC.

Is U1433 a current malfunction?


Yes

 [Go to 5.](#)

No

 [Go to 7.](#)

5. CHECK DTC (CURRENT MALFUNCTION).

1. Turn the ignition switch to OFF.
2. Disconnect the stereo camera connector.
3. Connect the disconnected connectors.
4. Read the DTC using Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U1433 a current malfunction?


Yes

 [Go to 6.](#)

No

 [Go to 7.](#)

6. CHECK DTC.

Using the Subaru Select Monitor, read DTC of all the systems.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the EyeSight data abnormal detected in several modules?


Yes

Replace the stereo camera.  [Ref. to EyeSight>Stereo Camera.](#)

No

Replace the module that the DTC has been detected.

7. CHECK HARNESS.


1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U1433 a current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

 [Go to 8.](#)

8. CHECK CONNECTOR.



Check the connector used for high speed CAN for poor contact.


Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.

 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1534 INVALID DATA RECEIVED FROM SONAR ECU

DTC detecting condition:

Defective data was transmitted from stereo camera.

Trouble symptom:

Cooperation control of EyeSight does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness.


 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Was the basic diagnostic procedure performed up to step 7?

Yes

 [Go to 2.](#)

No

Perform the basic diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Are DTCs other than U*** displayed?

Yes

Perform the diagnosis for DTCs other than the displayed U-code.

No

 [Go to 3.](#)

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed?

Yes

Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.

No


 [Go to 4.](#)

4. CHECK DTC (CURRENT MALFUNCTION).


Check the displayed DTC.

Is U1534 current malfunction?


Yes

 [Go to 5.](#)

No

 [Go to 7.](#)

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the RAB CM connector.
3. Connect the disconnected connectors.
4. Read the DTC using Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U1534 current malfunction?


Yes

 [Go to 5.](#)

No


 [Go to 8.](#)

6. CHECK DTC.

Using the Subaru Select Monitor, read DTC of all the systems.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is the sonar invalid data detected in several modules?


Yes

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking_CM.](#)

No

Replace the module that the DTC has been detected.

7. CHECK HARNESS.


1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read DTC of CAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is U1534 current malfunction?

Yes

Repair the poor contact of harness, or replace the harness.

No

 [Go to 8.](#)

8. CHECK CONNECTOR.




Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes

Repair the connector that has poor contact, or replace harness.

No

It is possible that temporary poor communication occurs. Delete the DTC.
 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [All diagnosis code].


Note:


- For detailed operation procedures, refer to "Application help".
- For details concerning DTC, refer to List of Diagnostic Trouble Code (DTC).

 [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

INSPECTION

1. DTC OTHER THAN U-CODE IS DISPLAYED

1. CHECK DTC (CURRENT MALFUNCTION). 


1. Start the engine.
2. Read all DTCs.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC other than U-code displayed?

Yes Perform the diagnosis for DTC other than the U-code.

No Perform troubleshooting according to phenomenon of the problem. (If no phenomenon of the problem is present, it is normal currently.)


2. FASTER/SLOWER VEHICLE SPEED THAN THE ACTUAL SPEED IS DISPLAYED


1. CHECK THE ACTUAL VEHICLE SPEED. 


Check that the vehicle speed indicated in the meter matches with the actual vehicle speed.

Does the vehicle speed match?

Yes Currently, it is normal.


No  [Go to 2.](#)

2. CHECK DTC (CURRENT MALFUNCTION). 

Read DTC of combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE displayed?


Yes

Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS).  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No

 [Go to 3.](#)

3. CHECK SPEEDOMETER.


Connect the Subaru Select Monitor, and perform forced operation of the speedometer with [Active Test] for the combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Active Test.](#)

Do the indicated vehicle speed on Subaru Select Monitor and the speedometer indication match?

Yes


Perform a unit inspection for the vehicle speed sensor.

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

3. MORE/LESS FUEL THAN THE ACTUAL AMOUNT IS DISPLAYED

1. CHECK DTC (CURRENT MALFUNCTION).

Read DTC of combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is [FUEL SENDER OPEN DETECTED] displayed?

Yes


Perform the diagnosis for the displayed DTCs.

No

 [Go to 2.](#)

2. CHECK DTC (CURRENT MALFUNCTION).

1. Start the engine.

2. Read all DTCs.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U**** displayed?

Yes

Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No

[Go to 3.](#)

3. CHECK FUEL GAUGE.

Connect the Subaru Select Monitor, and perform forced operation of the fuel gauge with [Active Test] for the combination meter. [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Active Test.](#)

Do the indicated amount on Subaru Select Monitor and the fuel gauge indication match?

Yes

Perform a unit inspection for the fuel sub level sensor and the fuel level sensor. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Sub Level Sensor.](#) [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Sub Level Sensor.](#) [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Level Sensor.](#) [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Level Sensor.](#)

No

Replace the combination meter. [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

4. FUEL LEVEL WARNING LIGHT ILLUMINATES DESPITE OF SUFFICIENT FUEL

1. CHECK DTC (CURRENT MALFUNCTION).

Read DTC of combination meter. [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is [FUEL SENDER OPEN DETECTED] displayed?


Yes

Perform the diagnosis for the displayed DTCs.

No


[Go to 2.](#)

2. CHECK DTC (CURRENT MALFUNCTION).

1. Start the engine.
2. Read all DTCs.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U**** displayed?


Yes

Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS).  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No





 [Go to 3.](#)

3. CHECK FUEL LEVEL WARNING LIGHT.

Connect the Subaru Select Monitor, and perform forced operation of the fuel level warning light with [Active Test] for the combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Active Test.](#)

Do the indicated amount on Subaru Select Monitor and the fuel level warning light indication match?

Yes



Perform a unit inspection for the fuel sub level sensor and the fuel level sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Sub Level Sensor.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Sub Level Sensor.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Fuel Level Sensor.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DOTC\)>Fuel Level Sensor.](#)

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

5. ENGINE COOLANT TEMPERATURE LIGHT BLINKS IN RED AND BLUE ALTERNATELY

1. CHECK DTC (CURRENT MALFUNCTION).

Read DTC of engine.  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#)  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is any of [ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE], [ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT LOW], [ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT HIGH] displayed?


Yes

Perform the diagnosis for the displayed DTCs.

No


 [Go to 2.](#)

2. CHECK DTC (CURRENT MALFUNCTION).

1. Start the engine.
2. Read all DTCs.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U**** displayed?


Yes

Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS).  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No



 [Go to 3.](#)

3. CHECK THE ENGINE COOLANT TEMPERATURE LIGHT.


Connect the Subaru Select Monitor, and perform forced operation of the engine coolant temperature light with [Active Test] for the combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Active Test.](#)

Do the indicated amount on Subaru Select Monitor and the engine coolant temperature light indication match?

Yes

Perform a unit inspection of the engine coolant temperature sensor.  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Engine Coolant Temperature Sensor.](#)  [Ref. to FUEL INJECTION \(FUEL SYSTEMS\) \(H4DOTC\)>Engine Coolant Temperature Sensor.](#)

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

6. [S], [I] OR [S#] INDICATOR IS BLINKING

1. CHECK DTC (CURRENT MALFUNCTION).

Read DTC of engine and combination meter. [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Read Diagnostic Trouble Code \(DTC\).](#) [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DOTC\)>Read Diagnostic Trouble Code \(DTC\).](#) [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes

Perform the diagnosis for the displayed DTCs.

No

[Go to 2.](#)

2. CHECK DTC (CURRENT MALFUNCTION).

1. Start the engine.
2. Read all DTCs. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U**** displayed?

Yes

Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No

[Go to 3.](#)

3. CHECK THE ENGINE COOLANT TEMPERATURE LIGHT.

Connect the Subaru Select Monitor, and perform forced operation of the SI-DRIVE indication with [Active Test] for the combination meter. [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Active Test.](#)

Do the indicated amount on Subaru Select Monitor and the SI-DRIVE indication match?

Yes

Check the engine. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Basic Diagnostic Procedure.](#) [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Basic Diagnostic Procedure.](#)

No

Replace the combination meter. [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

7. THE VDC WARNING LIGHT ILLUMINATES

1. CHECK DTC (CURRENT MALFUNCTION).



Read DTC of the VDC. [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes

Perform the diagnosis for the displayed DTCs.

No

[Go to 2.](#)

2. CHECK DTC (CURRENT MALFUNCTION).



1. Start the engine.
2. Read all DTCs. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U**** displayed?

Yes

Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No

[Go to 3.](#)

3. CHECK VDC WARNING LIGHT.



Connect the Subaru Select Monitor, and perform forced operation of the [VDC operation/failure indicator] with [Active Test] for the combination meter. [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Active Test.](#)

Do the indicated amount on Subaru Select Monitor and the [VDC operation/failure indicator] indication match?

Yes

Check the VDC warning light. [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Warning Light Illumination Pattern.](#)

No

Replace the combination meter. [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

8. VDC-OFF INDICATOR ILLUMINATES

1. CHECK DTC (CURRENT MALFUNCTION).

Read DTC of the VDC. [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes

Perform the diagnosis for the displayed DTCs.

No

[Go to 2.](#)

2. CHECK DTC (CURRENT MALFUNCTION).

1. Start the engine.

2. Read all DTCs. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U**** displayed?

Yes

Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No

[Go to 3.](#)

3. CHECK VDC OFF INDICATOR LIGHT.

Connect the Subaru Select Monitor, and perform forced operation of the [VDC OFF indicator] with [Active Test] for the combination meter. [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Active Test.](#)

Do the indicated amount on Subaru Select Monitor and the [VDC OFF indicator] indication match?

Yes


Check the VDC OFF indicator light. [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Warning Light Illumination Pattern.](#)

No

Replace the combination meter. [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

9. BRAKE WARNING LIGHT ILLUMINATES

1. CHECK DTC (CURRENT MALFUNCTION).


Read DTC of the VDC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes


Perform the diagnosis for the displayed DTCs.

No

 [Go to 2.](#)


2. CHECK DTC (CURRENT MALFUNCTION).

1. Start the engine.

2. Read all DTCs.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U**** displayed?


Yes

Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS).  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No


 [Go to 3.](#)

3. CHECK BRAKE WARNING LIGHT.


Connect the Subaru Select Monitor, and perform forced operation of the [BRAKE warning] with [Active Test] for the combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Active Test.](#)

Do the indicated amount on Subaru Select Monitor and the [BRAKE warning] indication match?

Yes


Check the brake warning light.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Warning Light Illumination Pattern.](#)

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

10. SHIFT POSITION IS NOT DISPLAYED

1. CHECK DTC (CURRENT MALFUNCTION).


Read the DTC of the TCM.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes


Perform the diagnosis for the displayed DTCs.

No

 [Go to 2.](#)


2. CHECK DTC (CURRENT MALFUNCTION).

1. Start the engine.

2. Read all DTCs.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U**** displayed?


Yes

Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS).  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No


 [Go to 3.](#)

3. CHECK SHIFT INDICATOR.

Connect the Subaru Select Monitor, and perform forced operation of the shift indicator with [Active Test] for the combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Active Test.](#)

Do the indication on Subaru Select Monitor and the shift indicator indication match?

Yes


Check the shift indicator.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Diagnostic Procedure without Diagnostic Trouble Code \(DTC\).](#)

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER](#)

11. AT OIL TEMPERATURE WARNING LIGHT IS BLINKING

1. CHECK DTC (CURRENT MALFUNCTION).

Read the DTC of the TCM.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes


Perform the diagnosis for the displayed DTCs.

No

 [Go to 2.](#)


2. CHECK DTC (CURRENT MALFUNCTION).

1. Start the engine.

2. Read all DTCs.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U**** displayed?


Yes

Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS).  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No

 [Go to 3.](#)

3. CHECK AT OIL TEMP LIGHT.

Connect the Subaru Select Monitor, and perform forced operation of the [AT (CVT) oil temperature warning] with [Active Test] for the combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Active Test.](#)

Do the indicated amount on Subaru Select Monitor and the [AT (CVT) oil temperature warning] indication match?


Yes

 [Go to 4.](#)

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

4. PERFORM CVT LEARNING.


Connect the Subaru Select Monitor and perform the CVT learning.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Learning Control.](#)

Does the AT oil temperature warning light go off?

Yes


Currently, it is normal.

No

Check the AT OIL TEMP light.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>AT OIL TEMP Warning Light Display.](#)

12. DOOR INDICATOR IS NOT DISPLAYED

1. CHECK DTC (CURRENT MALFUNCTION).


Read the DTC of the body integrated unit.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?


Yes

Perform the diagnosis for the displayed DTCs.

No


 [Go to 2.](#)

2. CHECK DTC (CURRENT MALFUNCTION).

1. Start the engine.
2. Read all DTCs.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U**** displayed?


Yes

Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS).  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No

 [Go to 3.](#)

3. CHECK DOOR INDICATOR.


Connect the Subaru Select Monitor, and perform forced operation of the door indicator with [Active Test] for the combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Active Test.](#)

Do the indication on Subaru Select Monitor and the door indicator indication match?


 [Go to 4.](#)


Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

4. CHECK DATA MONITOR FOR BODY INTEGRATED UNIT.

Connect the Subaru Select Monitor, and display the data monitor of the body integrated unit: [Driver's door SW input], [P-door SW input], [Rear right door SW input], [Rear left door SW input].  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Data Monitor.](#)


Do the door open/close and data indication match?

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

Inspect door switch circuit.  [Ref. to SECURITY AND LOCKS>Keyless Entry System>INSPECTION.](#)

13. CLEARANCE INDICATOR DOES NOT ILLUMINATE

1. CHECK DTC (CURRENT MALFUNCTION).

Read the DTC of the body integrated unit.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Perform the diagnosis for the displayed DTCs.

 [Go to 2.](#)

2. CHECK DTC (CURRENT MALFUNCTION).



1. Start the engine.
2. Read all DTCs. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U**** displayed?

Yes

Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No

[Go to 3.](#)

3. CHECK CLEARANCE INDICATOR.



Connect the Subaru Select Monitor, and perform forced operation of the [Position light indicator] with [Active Test] for the combination meter. [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Active Test.](#)

Do the indication on Subaru Select Monitor and the clearance indicator indication match?

Yes

[Go to 4.](#)

No

Replace the combination meter. [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

4. CHECK DATA MONITOR FOR BODY INTEGRATED UNIT.



Connect the Subaru Select Monitor, and display the data monitor of the body integrated unit: [Lighting I Switch Input]. [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Data Monitor.](#)

Do the switch operation and data indication match?

Yes


Replace the body integrated unit. [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

No

Check the clearance light. [Ref. to LIGHTING SYSTEM>Clearance Light and Illumination Light System.](#)

14. HI BEAM INDICATOR DOES NOT ILLUMINATE

1. CHECK DTC (CURRENT MALFUNCTION).

Read the DTC of the body integrated unit.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes


Perform the diagnosis for the displayed DTCs.

No

 [Go to 2.](#)


2. CHECK DTC (CURRENT MALFUNCTION).

1. Start the engine.

2. Read all DTCs.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U**** displayed?


Yes

Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS).  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No

 [Go to 3.](#)

3. CHECK HI BEAM INDICATOR.

Connect the Subaru Select Monitor, and perform forced operation of the [High-beam indicator] with [Active Test] for the combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Active Test.](#)

Do the indication on Subaru Select Monitor and the HI beam indicator indication match?


Yes

 [Go to 4.](#)

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

4. CHECK DATA MONITOR FOR BODY INTEGRATED UNIT.


Connect the Subaru Select Monitor, and display the data monitor of the body integrated unit: [Dimmer Hi Switch Input].  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Data Monitor.](#)

Do the switch operation and data indication match?

Yes


Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

No

Check the headlight system.  [Ref. to LIGHTING SYSTEM>Headlight System.](#)

15. FRONT FOG LIGHT INDICATOR DOES NOT ILLUMINATE

1. CHECK DTC (CURRENT MALFUNCTION).

Read the DTC of the body integrated unit.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes


Perform the diagnosis for the displayed DTCs.

No

 [Go to 2.](#)


2. CHECK DTC (CURRENT MALFUNCTION).

1. Start the engine.

2. Read all DTCs.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U**** displayed?


Yes

Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS).  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No

 [Go to 3.](#)

3. CHECK THE FRONT FOG LIGHT INDICATOR.

Connect the Subaru Select Monitor, and perform forced operation of the [Front fog light indicator] with [Active Test] for the combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Active Test.](#)

Do the indication on Subaru Select Monitor and the front fog light indicator indication match?


Yes

 [Go to 4.](#)

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

4. CHECK DATA MONITOR FOR BODY INTEGRATED UNIT.


Connect the Subaru Select Monitor, and display the data monitor of the body integrated unit: [Front fog lamp SW input].  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Data Monitor.](#)

Do the switch operation and data indication match?

Yes


Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

No

Check the front fog light system.  [Ref. to LIGHTING SYSTEM>Front Fog Light System.](#)

16. ILLUMINATION IS FIXED AT THE MAXIMUM BRIGHTNESS

1. CHECK DTC (CURRENT MALFUNCTION).

Read DTC of combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?


Yes

Perform the diagnosis for the displayed DTCs.

No


 [Go to 2.](#)

2. CHECK DTC (CURRENT MALFUNCTION).

1. Start the engine.
2. Read all DTCs.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U**** displayed?


Yes

Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS).  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No


 [Go to 3.](#)

3. CHECK ILLUMINATION.

Connect the Subaru Select Monitor, and perform forced operation of the [Illumination Check] with [Active Test] for the combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Active Test.](#)

Do the indication on Subaru Select Monitor and the indicator indication match?

Yes


Check the clearance light & illumination light system.  [Ref. to LIGHTING SYSTEM>Clearance Light and Illumination Light System.](#)

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)


17. CRUISE CONTROL INDICATOR DOES NOT ILLUMINATE

1. CHECK DTC (CURRENT MALFUNCTION).

1. Start the engine.
2. Read all DTCs.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U**** displayed?



Yes

Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS).  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No


 [Go to 2.](#)

2. CHECK DATA MONITOR OF ENGINE.


Connect the Subaru Select Monitor, and display the data monitor of the engine: [Main Switch].  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DO\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)  [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Do the switch operation and data indication match?

Yes

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

No

Check the cruise control command switch.  [Ref. to CRUISE CONTROL SYSTEM>Cruise Control Command Switch.](#)

18. AWD INDICATOR ILLUMINATES

1. CHECK MODE.

Connect the Subaru Select Monitor and change to AWD mode.

Note:

When AWD ON/OFF switching mode is not available, go to step 2.

Did the AWD indicator go off?


Yes

Currently, it is normal.

No

 [Go to 2.](#)

2. CHECK DTC (CURRENT MALFUNCTION).


Read the DTC of the TCM.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes


Perform the diagnosis for the displayed DTCs.

No

 [Go to 3.](#)


3. CHECK DTC (CURRENT MALFUNCTION).



1. Start the engine.
2. Read all DTCs.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U**** displayed?

Yes


Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS).  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No

 [Go to 4.](#)


4. CHECK AWD INDICATOR.




Connect the Subaru Select Monitor, and perform forced operation of the [AWD warning] with [Active Test] for the combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Active Test.](#)

Do the indication on Subaru Select Monitor and the AWD indicator indication match?

Yes

Check the AWD indicator.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>AWD Warning Light Display.](#)


No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

19. HILL HOLD INDICATOR DOES NOT ILLUMINATE

1. CHECK DTC (CURRENT MALFUNCTION).




Read DTC of the VDC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes


Perform the diagnosis for the displayed DTCs.

No

 [Go to 2.](#)


2. CHECK DTC (CURRENT MALFUNCTION).




1. Start the engine.
2. Read all DTCs.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U**** displayed?

Yes











Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS).  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No

Check the hill hold indicator light.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>Warning Light Illumination Pattern.](#)

LAN SYSTEM (DIAGNOSTICS) > Diagnostics with Phenomenon

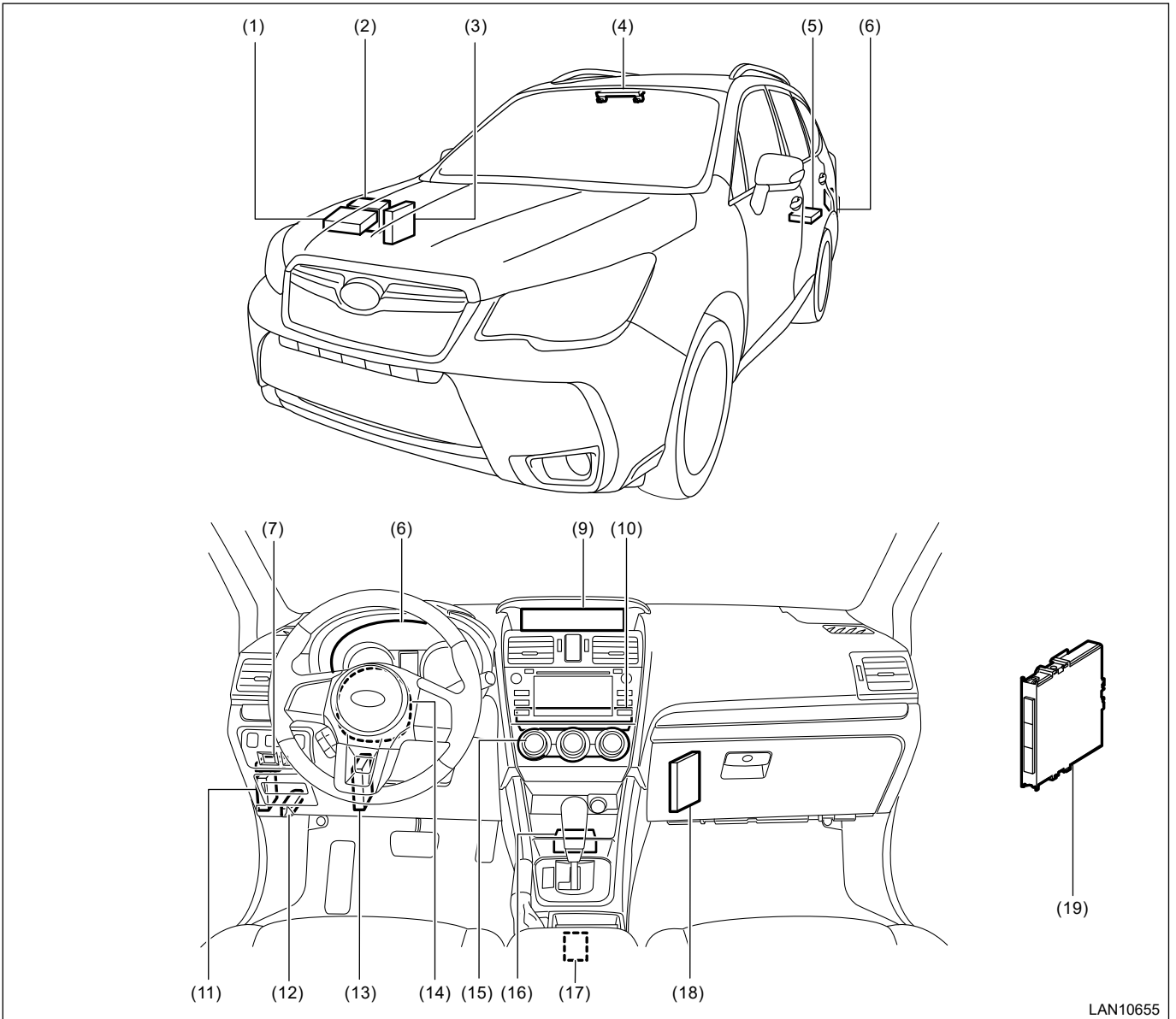
LIST

Symptoms	Reference
DTC other than U-code is displayed.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > DTC OTHER THAN U-CODE IS DISPLAYED.
Faster/slower vehicle speed than the actual speed is displayed.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > FASTER/SLOWER VEHICLE SPEED THAN THE ACTUAL SPEED IS DISPLAYED.
More/less fuel than the actual amount is displayed.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > MORE/LESS FUEL THAN THE ACTUAL AMOUNT IS DISPLAYED.
Fuel level warning light illuminates despite of sufficient fuel.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > FUEL LEVEL WARNING LIGHT ILLUMINATES DESPITE OF SUFFICIENT FUEL.
Engine coolant temperature light blinks in red and blue alternately.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > ENGINE COOLANT TEMPERATURE LIGHT BLINKS IN RED AND BLUE ALTERNATELY.
[S], [I] or [S#] indicator is blinking.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > [S],[I] OR [S#] INDICATOR IS BLINKING.
The VDC warning light illuminates.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE VDC WARNING LIGHT ILLUMINATES.
VDC-OFF indicator illuminates.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > VDC-OFF INDICATOR ILLUMINATES.
Brake warning light illuminates.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > BRAKE WARNING LIGHT ILLUMINATES.
Shift position is not displayed.	 Ref. to LAN SYSTEM

	(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > SHIFT POSITION IS NOT DISPLAYED.
AT oil temperature warning light is blinking.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > AT OIL TEMPERATURE WARNING LIGHT IS BLINKING.
Door indicator is not displayed.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > DOOR INDICATOR IS NOT DISPLAYED.
Clearance indicator does not illuminate.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CLEARANCE INDICATOR DOES NOT ILLUMINATE.
HI beam indicator does not illuminate.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > HI BEAM INDICATOR DOES NOT ILLUMINATE.
Front fog light indicator does not illuminate.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > FRONT FOG LIGHT INDICATOR DOES NOT ILLUMINATE.
Illumination is fixed at the maximum brightness.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > ILLUMINATION IS FIXED AT THE MAXIMUM BRIGHTNESS.
Cruise control indicator does not illuminate.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CRUISE CONTROL INDICATOR DOES NOT ILLUMINATE.
AWD indicator illuminates.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > AWD INDICATOR ILLUMINATES.
Hill hold indicator does not illuminate.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > HILL HOLD INDICATOR DOES NOT ILLUMINATE.

LAN SYSTEM (DIAGNOSTICS) > Electrical Component Location

LOCATION



LAN10655

- | | | |
|------------------------------------|--------------------------------------|----------------------------------|
| (1) Engine CM (turbo-model) | (8) Combination meter | (14) Steering angle sensor |
| (2) VDC CM | (9) MFD | (15) A/C control panel |
| (3) Power steering CM | (10) Data communication module (DCM) | (16) Airbag CM |
| (4) Stereo camera | (11) Body integrated unit | (17) Yaw rate & G sensor |
| (5) RAB CM | (12) Data link connector | (18) Engine CM (non-turbo model) |
| (6) Radar sensor LH | (13) Transmission CM | (19) Keyless access CM |
| (7) Auto headlight beam leveler CM | | |

LAN SYSTEM (DIAGNOSTICS) > General Description

CAUTION

1. SRS AIRBAG SYSTEM

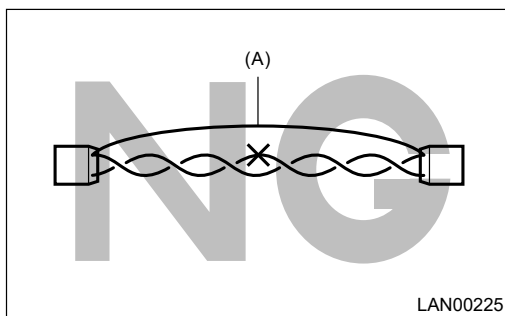
Airbag system wiring harness is routed near the body integrated unit and twisted pair line.

Caution:

- **Do not use the electrical test equipment on all airbag system wiring harnesses and connectors.**
- **Be careful not to damage the airbag system wiring harness when servicing the body integrated unit and LAN system.**

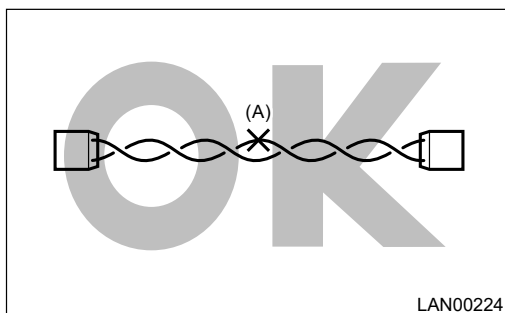
2. LAN SYSTEM

- Bus line of LAN system is twisted pair line. Be careful not to by-pass or partly unbind the twisted pair line.
- Do not make clearance between bus lines (CAN High, CAN Low).
- Difference of bus line length should be within 10 cm (3.94 in).
- Fray near the connector should be within 8 cm (3.14 in).



(A) Bypass wire connection

- If the characteristics of the twisted pair line are changed, it may extremely weaken against noise.
- When repairing the harness, connect the wires using soldering and protect it with electrical tape etc.



(A) Soldering and protection with electrical tape

3. TIME STAMP

There are three types of record data for the information of time stamp, and they are stored together with diagnostic codes.

Note:

Depending on DTCs, time stamp may not be stored.

a. **Trip Count [count]**

This indicates the number of times that the ignition has been turned to ON since the vehicle was manufactured. The ignition ON count of when the diagnostic code is stored is displayed on the diagnostic code check screen.

Note:

Subaru Select Monitor 4 screen (A/C system diagnostic code and time stamp)

Code	Description & trouble part	Trouble occurrence record	Trip Count [count]	Time Count	Group
B14E1	AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT WIRE BREAK (DRIVER'S SEAT)	Detected on the first time	983	18000	Common
B14E7	HEATER CORE REAR SENSOR CIRCUIT WIRE BREAK	Detected on the 2nd time	984	117800	Common

The current Trip Count can be checked at "Current Data Display & Save" in "Integ. unit mode". By comparing the current Trip Count and the Trip Count of when the diagnostic code was stored, it is possible to determine that it is how many ignition-ON operations ago that DTC was stored.

b. **Time Count**

The elapsed time from when the ignition is turned to ON to when the diagnostic code is stored is displayed on the diagnostic code check screen. It is possible to determine the length of time that passed between when the user started driving and when the diagnostic code was stored. Therefore, if Trip Count until the vehicle-received-date is determined by interviewing the user, it is possible to estimate where the user was driving when the diagnostic code was stored, using the information such as Trip Count and Time Count. This estimate is useful information to perform diagnosis including checking of repeatability.

Note:


Subaru Select Monitor 4 screen (A/C system diagnostic code and time stamp)

Code	Description & trouble part	Trouble occurrence record	Trip Count [count]	Time [msec]	Group
B14E1	AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT WIRE BREAK (DRIVER'S SEAT)	Detected on the first time	983	18000	Common
B14E7	HEATER CORE REAR SENSOR CIRCUIT WIRE BREAK	Detected on the 2nd time	984	117800	Common

When multiple diagnostic codes are recorded for one trouble, it is extremely important to determine the diagnostic code that was stored first. (It is important to perform the diagnosis for the first recorded diagnostic code.) In this case, it is also possible to immediately determine which diagnostic code was recorded first, using the information such as Trip Count and Time Count.

c. **Group**

Each unit individually counts the elapsed time since the ignition is turned to ON. However, these time counts may have some errors, and therefore, the control modules need to be adjusted to the time carried by the master-time unit (the body integrated unit). When the count is set as common,

it means that each control module is already adjusted to the master time, and the display for the master integrated unit is always indicated as "Common". When the count is indicated as "Originally", it means that the time is not synchronized with the master time. In this case, check the communication between the corresponding control module and integrated unit. When all controls other than the body integrated unit is indicated as "Originally", perform the basic inspection for the body integrated unit.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Note:


Subaru Select Monitor 4 screen (A/C system diagnostic code and time stamp)

Code	Description & trouble part	Trouble occurrence record	Trip Count [count]	Time Count [msec]	Group
B14E1	AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT WIRE BREAK (DRIVER'S SEAT)	Detected on the first time	983	18000	Common
B14E7	HEATER CORE REAR SENSOR CIRCUIT WIRE BREAK	Detected on the 2nd time	984	117800	Common

Even when multiple diagnostic codes are stored in multiple control modules, it is possible to determine the code stored first through the categorizing feature.


Note:


Troubleshooting for CAN system U-code occurrence

When the first stored diagnostic code is a U-code for CAN system, perform the troubleshooting as a U code combination, instead of a U code alone. In addition, when CAN open circuit occurs, communication of the diagnostic device itself becomes impossible beyond the particular areas. However, trouble positions can also be determined by the combination of initial communication success/failure. Thus, by performing the basic diagnostic procedure in LAN system, trouble positions can be determined efficiently on the principle above.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)


INSPECTION

1. INSPECTION WITHOUT USING CAN DIAGNOSTIC


1. CHECK BATTERY. 

Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)

Is the check result OK?


 [Go to 2.](#)

Charge or replace the battery.


2. CHECK FUSE. 

Check the fuse which might affect the problem.

Is the check result OK?


 [Go to 3.](#)

Replace the fuse. If the replaced fuse blows out easily, some type of fault is present. Therefore, repair the faulty portion.

3. CHECK HARNESS. 

Check the harness and harness connector connection which might affect the problem.


Is the check result OK?

Go to 3 in the Basic Diagnostic Procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

Repair or replace the faulty harness or harness connector.

2. INSPECTION USING CAN DIAGNOSTIC

1. CHECK BODY INTEGRATED UNIT REGISTRATION STATUS.

Check that settings of body integrated unit correspond to vehicle equipment.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Registration Body Integrated Unit.](#)

Does the vehicle equipment correspond to settings?


Yes

 [Go to 2.](#)

No

Match the settings of the body integrated unit with the vehicle equipment.

2. SET THE CUSTOMIZE SETTINGS OF THE BODY INTEGRATED UNIT.

Check that settings of body integrated unit correspond to vehicle condition.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Customize.](#)

Do the customize settings correspond to the vehicle condition?

Yes

 [Go to 3.](#)

No


Match the settings of the body integrated unit with the vehicle condition.

3. CHECK FACTORY INITIAL SETTING OF BODY INTEGRATED UNIT.

Confirm [Factory initial setting] of body integrated unit registrations is [Market].

Is it set to [Market]?

Yes

Go to 4 in the Basic Diagnostic Procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)


No

Switch from [Factory] to [Market].

LAN SYSTEM (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	— (Newly adopted tool)	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".

2. GENERAL TOOL









TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.








3. PREPARATION ITEMS









ITEM NAME	REMARKS
120 Ω resistance element (1/4 W or more)	Used as an alternative to end resistance.









LAN SYSTEM (DIAGNOSTICS) > List of Diagnostic Trouble Code (DTC)




LIST

DTC	Item	Content of diagnosis	Note
U0073	CAN FAILURE, BUS 'OFF' DETECTION	Any unit is cut communication.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	Not received data from ECM.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0101	LOST COMMUNICATION WITH TCM	Not received data from TCM.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Data does not arrive from VDC module.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0123	LOST COMMUNICATION WITH YAW RATE SENSOR MODULE	Data does not arrive from yaw rate & G sensor.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0123 LOST COMMUNICATION WITH YAW RATE SENSOR MODULE.
U0126	LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE	Data does not arrive from steering angle sensor.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0126 LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE.
U0131	LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE	Data does not arrive from EPS module.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0131 LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE.
U0140	LOST COMMUNICATION	Data does not arrive	 Ref. to LAN SYSTEM

	WITH BODY CONTROL MODULE	from body integrated unit.	(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0151	LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE	Data does not arrive from airbag module.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0151 LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Not received data from meter.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0156	LOST COMMUNICATION WITH INFORMATION CENTER "A"	Data does not arrive from MFD.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0156 LOST COMMUNICATION WITH INFORMATION CENTER "A".
U0164	LOST COMMUNICATION WITH HVAC CONTROL MODULE	No data is received from A/C control panel	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0164 LOST COMMUNICATION WITH HVAC CONTROL MODULE.
U0181	LOST COMMUNICATION WITH HEADLAMP LEVELING CONTROL MODULE	No data is received from auto headlight beam leveler CM	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0181 LOST COMMUNICATION WITH HEADLAMP LEVELING CONTROL MODULE.
U0327	SOFTWARE INCOMPATIBILITY WITH VEHICLE SECURITY CONTROL MODULE	Data does not arrive from keyless access CM.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0327 SOFTWARE INCOMPATIBILITY WITH VEHICLE SECURITY CONTROL MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	Received error data from ECM.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".


U0402	INVALID DATA RECEIVED FROM TCM	Received error data from TCM.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0402 INVALID DATA RECEIVED FROM TCM.
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	Error data is received from VDC module.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0420	INVALID DATA RECEIVED FROM POWER STEERING CONTROL MODULE	Error data is received from EPS module.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0420 INVALID DATA RECEIVED FROM POWER STEERING CONTROL MODULE.
U0422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE	Error data is received from body integrated unit.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE.
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	Received error data from meter.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.
U0424	INVALID DATA RECEIVED FROM HVAC CONTROL MODULE	Error data is received from A/C control panel.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0424 INVALID DATA RECEIVED FROM HVAC CONTROL MODULE.
U0427	INVALID DATA RECEIVED FROM VEHICLE SECURITY CONTROL MODULE	Error data is received from keyless access CM.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0427 INVALID DATA RECEIVED FROM VEHICLE SECURITY CONTROL MODULE.
U0428	INVALID DATA RECEIVED FROM STEERING ANGLE SENSOR MODULE	Error data is received from steering angle sensor.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0428 INVALID DATA RECEIVED FROM STEERING ANGLE SENSOR MODULE.

U0452	INVALID DATA RECEIVED FROM RESTRAINTS CONTROL MODULE	Error data is received from airbag module.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0452 INVALID DATA RECEIVED FROM RESTRAINTS CONTROL MODULE.
U0457	MFD data abnormality	Received error data from MFD	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0457 INVALID DATA RECEIVED FROM INFORMATION CENTER "A".
U0482	Invalid data received from auto headlight beam leveler	Received error data from auto headlight beam leveler CM	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0482 INVALID DATA RECEIVED FROM HEADLAMP LEVELING CONTROL MODULE.
U0513	INVALID DATA RECEIVED FROM YAW RATE SENSOR MODULE	Error data is received from yaw rate & G sensor.	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0513 INVALID DATA RECEIVED FROM YAW RATE SENSOR MODULE.
U1073	Control Module Communication Bus "SONAR-CAN" Off	RAB CM communication is shut down because of high speed CAN error	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1073 CONTROL MODULE COMMUNICATION BUS "SONAR-CAN" OFF.
U1201	CAN-HS COUNTER ABNORMAL	Malfunction of high-speed CAN communication	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1201 CAN-HS COUNTER ABNORMAL.
U1232	LOST COMMUNICATION WITH REAR/SIDE RADAR CONTROL MODULE	No data is received from radar sensor	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1232 LOST COMMUNICATION WITH REAR/SIDE RADAR CONTROL MODULE.
U1233	Lost Communication with RAB Control Module	No data is received from RAB CM	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1233 LOST COMMUNICATION WITH RAB CONTROL MODULE.

U1235	LOST COMMUNICATION WITH EyeSight	Data does not arrive from stereo camera	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1235 LOST COMMUNICATION WITH EyeSight.
U1433	INVALID DATA RECEIVED FROM EyeSight	Error data is received from stereo camera	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1433 INVALID DATA RECEIVED FROM EyeSight.
U1534	Invalid data received from sonar data	Error data is received from RAB CM	 Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1534 INVALID DATA RECEIVED FROM SONAR ECU.

1. CHECK USING THE DTC CHECK SHEET

DTC check sheet



	(A)	(B)	(C)																(D)																
			ECM	TCM	VDC	Y&G	STR	EPS	BIU	A/B	MET	MFD	A/C	AHL	KPS	RAD	RAB	CAM	ECM	TCM	VDC	EPS	BIU	MET	A/C	KPS	STR	A/B	MFD	AHL	Y&G	HS-CAN	CAM	RAB	
			U0073	U1073	U0100	U0101	U0122	U0123	U0126	U0131	U0140	U0151	U0155	U0156	U0164	U0181	U0327	U1232	U1233	U1235	U0401	U0402	U0416	U0420	U0422	U0423	U0424	U0427	U0428	U0452	U0457	U0482	U0513	U1201	U1433
VDC			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CAM						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BIU			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MET			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MFD			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A/C			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DCM			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RAB			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RAD			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TCM			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KPS			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AHL			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPS			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A/B			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ECM			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

LAN10707

- (A) Installation check
- (B) Bus off detection
- (C) Data no-receive detection
- (D) Data abnormal detection
- VDC: VDC CM
- CAM: Stereo camera
- BIU: Body integrated unit
- MET: Combination meter
- MFD: MFD
- HL: Auto headlight beam leveler CM
- KPS: Keyless access CM
- EPS: Power steering CM
- A/B: Airbag CM
- Y & G: Yaw rate & G sensor

A/C: A/C control panel

DCM: Data communication module

TCM: Transmission CM

RAD: Radar sensor

STR: Steering angle sensor

ECM: Engine CM


RAB: RAB CM

1. MODULE INSTALLATION CHECK.


1. Using the check sheet for communication for initializing, check the vehicle installation module (module targeted for CAN communication).
2. Write "-" marks in the field for installation check (A) if the vehicle to be inspected does not have relevant module.
3. Write "-" marks in all blank fields on the same row that the "-" mark has filled in.

Was the module installation check above performed?

Yes

 [Go to 2.](#)


No

Perform the module installation check,  [Go to 2.](#)

2. CHECK DTC (BUS OFF DETECTION / DATA NOT RECEIVED).

Check the DTC.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Note:


It becomes impossible for CAN diagnostic module to read DTC, if there is a current malfunction of open harness (data not received). If this occurs, perform the "Check using the check sheet of communication for initializing"  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Subaru Select Monitor>COMMUNICATION FOR INITIALIZING IMPOSSIBLE > CHECK USING THE CHECK SHEET OF COMMUNICATION FOR INITIALIZING.](#), and use this check sheet to confirm that the corresponding part becomes the past malfunction.

Is DTC bus off or data not received?

Yes

Perform the diagnosis for the displayed DTCs.

No


Perform the communication check, and go to 3.  [Go to 3.](#)

3. CHECK DTC (BUS OFF DETECTION / DATA NOT RECEIVED).


Mark "X" in the field corresponding to the DTCs that has been detected by each module in the DTC check sheet.

Were all the corresponding field in the DTC check sheet filled?

Yes

 [Go to 4.](#)

No

Fill all the corresponding field in the DTC check sheet,  [Go to 4.](#)

4. ENTER HERE. CHECK CAN COMMUNICATION LINE.



Check the CAN communication line by referring to the example of DTC data not received.

Is CAN communication line faulty?

Yes

Repair or replace the faulty portion of the harness.

No

Perform the diagnosis for the displayed DTCs.

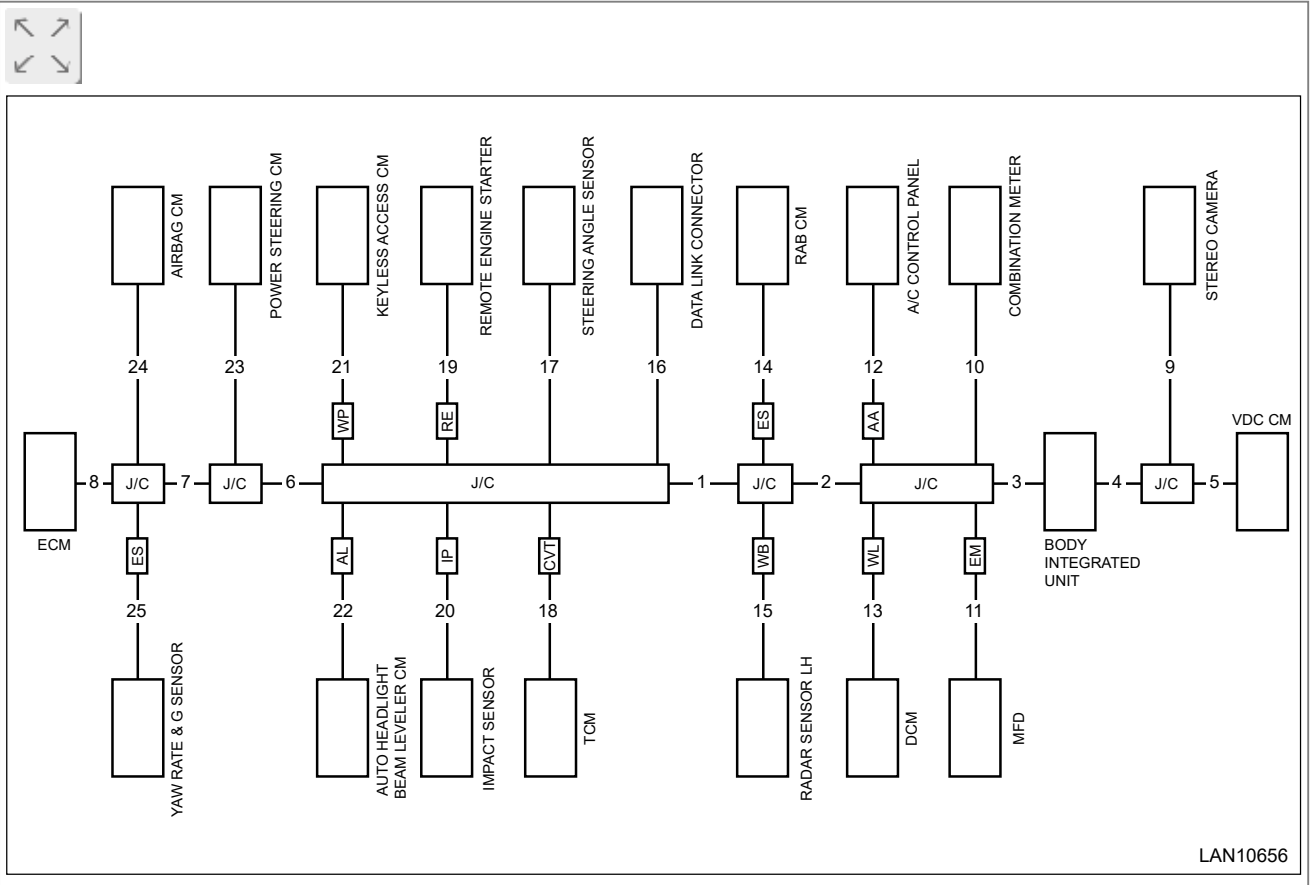
2. EXAMPLE OF DTC DATA NOT RECEIVED

Note:

Only the sheet for bus off, data no-receive entry is shown.

(This is because, when data error occurs at the bus off, data no-receive condition, the diagnosis for these problems is performed first.)

NON-TURBO MODEL



When No. 17 (steering angle sensor vicinity) is open



	(A)	(B)		(C)												(D)																							
		U0073	U1073	ECM	TCM	VDC	Y&G	STR	EPS	BIU	A/B	MET	MFD	A/C	AHL	KPS	RAD	RAB	CAM	ECM	TCM	VDC	EPS	BIU	MET	A/C	KPS	STR	A/B	MFD	AHL	Y&G	HS-CAN	CAM	RAB				
				U0100	U0101	U0122	U0123	U0126	U0131	U0140	U0151	U0155	U0156	U0164	U0181	U0327	U1232	U1233	U1235	U0401	U0402	U0416	U0420	U0422	U0423	U0424	U0427	U0428	U0452	U0457	U0482	U0513	U1201	U1433	U1534				
VDC		-		-		X																																	
CAM						X																																	
BIU		-																																					
MET		-																																					
MFD		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A/C		-																																					
DCM		-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
RAB		-																																					
RAD		-																																					
TCM		-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
KPS		-																																					
AHL		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
EPS		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A/B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ECM		-	-																																				

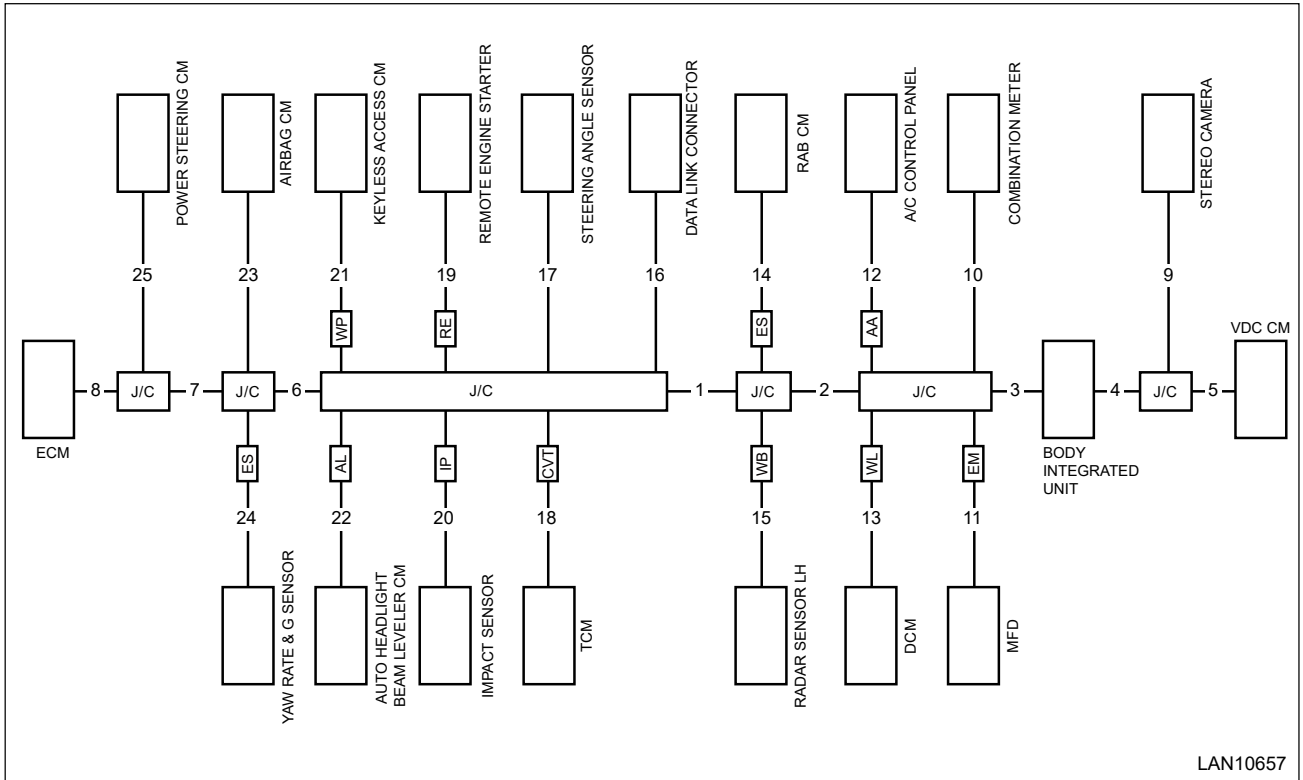
LAN10708

When No. 19 (remote engine start CM vicinity) is open

Note:

The remote engine starter does not operate while no DTC is detected.





When No. 17 (steering angle sensor vicinity) is open



	(A)		(B)																	(C)																	(D)																
	U0073	U1073	ECM	TCM	VDC	Y&G	STR	EPS	BIU	A/B	MET	MFD	A/C	AHL	KPS	RAD	RAB	CAM	ECM	TCM	VDC	EPS	BIU	MET	A/C	KPS	STR	A/B	MFD	AHL	Y&G	HS-CAN	CAM	RAB																			
			U0100	U0101	U0122	U0123	U0126	U0131	U0140	U0151	U0155	U0156	U0164	U0181	U0327	U1232	U1233	U1235	U0401	U0402	U0416	U0420	U0422	U0423	U0424	U0427	U0428	U0452	U0457	U0482	U0513	U1201	U1433	U1534																			
VDC			-		-		X	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																			
CAM						-	X			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																			
BIU			-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																		
MET			-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																		
MFD			-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																		
A/C			-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																		
DCM			-		-																																																
RAB			-																																																		
RAD			-																																																		
TCM			-		-																																																
KPS			-																																																		
AHL			-																																																		
EPS			-																																																		
A/B			-																																																		
ECM			-																																																		

LAN10708

When No. 19 (remote engine start CM vicinity) is open

Note:

	(A)	(B)		(C)											(D)																									
		U0073	U1073	ECM	TCM	VDC	Y&G	STR	EPS	BIU	A/B	MET	MFD	A/C	AHL	KPS	RAD	RAB	CAM	ECM	TCM	VDC	EPS	BIU	MET	A/C	KPS	STR	A/B	MFD	AHL	Y&G	HS-CAN	CAM	RAB					
VDC			-			-	X																																	
CAM																																								
BIU			-																																					
MET			-																																					
MFD			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
A/C			-																																					
DCM			-		-																																			
RAB			-																																					
RAD			-																																					
TCM			-		-																																			
KPS			-																																					
AHL			-	-	-																																			
EPS			-		-																																			
A/B			-	-	-																																			
ECM			-	-																																				

LAN SYSTEM (DIAGNOSTICS) > Subaru Select Monitor

COMMUNICATION FOR INITIALIZING IMPOSSIBLE


Diagnosis:

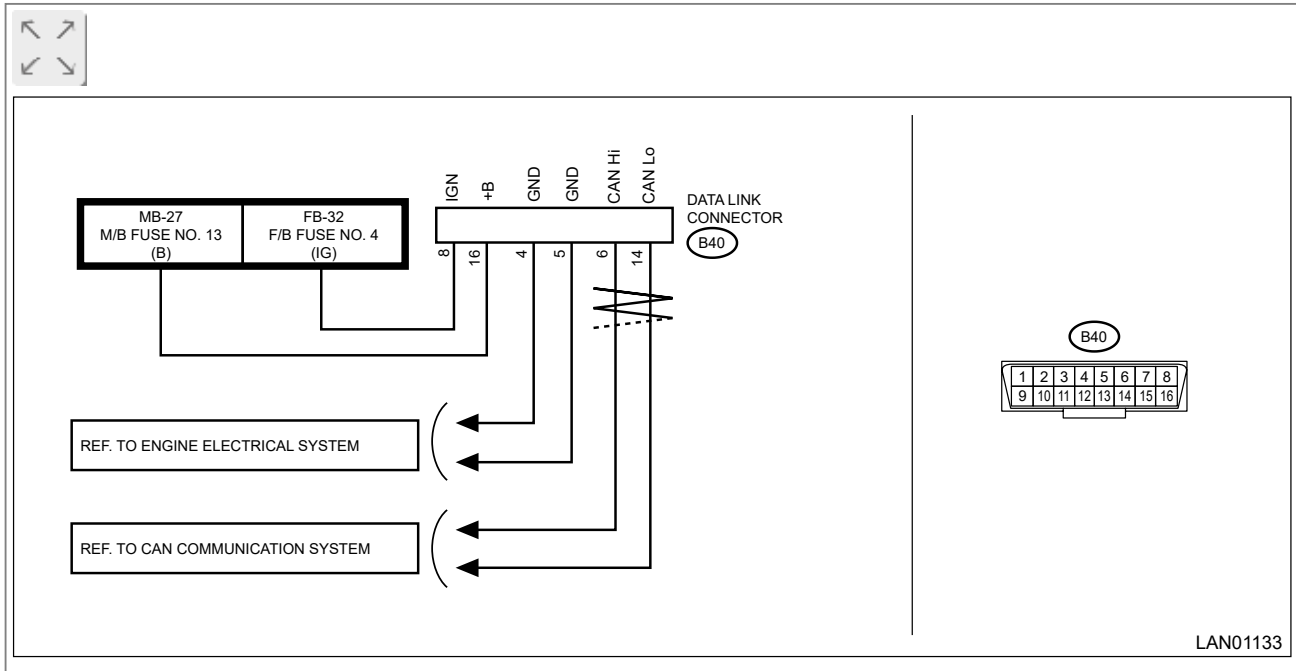
Subaru Select Monitor communication line is open or shorted.

Trouble symptom:

Not communicable with Subaru Select Monitor.

Wiring diagram:

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)



1. CHECK SUBARU SELECT MONITOR.

1. Connect the Subaru Select Monitor to another vehicle.
2. Check communication condition between Subaru Select Monitor and vehicle.

Is communication performed normally?

Yes

 [Go to 2.](#)

No

Subaru Select Monitor unit or diagnosis cable is faulty. Or check the fuse on the vehicle side.

2. CHECK HARNESS (OPEN CIRCUIT).

Use a tester to check for continuity in the ground circuit.


Connector & terminal

(B40) No. 4 — Chassis ground:

(B40) No. 5 — Chassis ground:

Is there continuity?

Yes

 [Go to 3.](#)

No

Repair or replace the open circuit.

3. CHECK POWER SUPPLY CIRCUIT FOR DATA LINK CONNECTOR.

1. Turn the ignition switch to ON.
2. Using a tester, check the power supply of data link connector.

Connector & terminal

(B40) No. 8 (+) — Chassis ground (–):

(B40) No. 16 (+) — Chassis ground (–):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

Check the fuse and power supply circuit for data link connector.

4. CHECK COMMUNICATION FOR INITIALIZING ERROR.

Perform the communication for initializing with each module by connecting the Subaru Select Monitor. (For systems whose module can communicate with diagnostic devices)

Is the communication possible with all modules?


Yes

The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

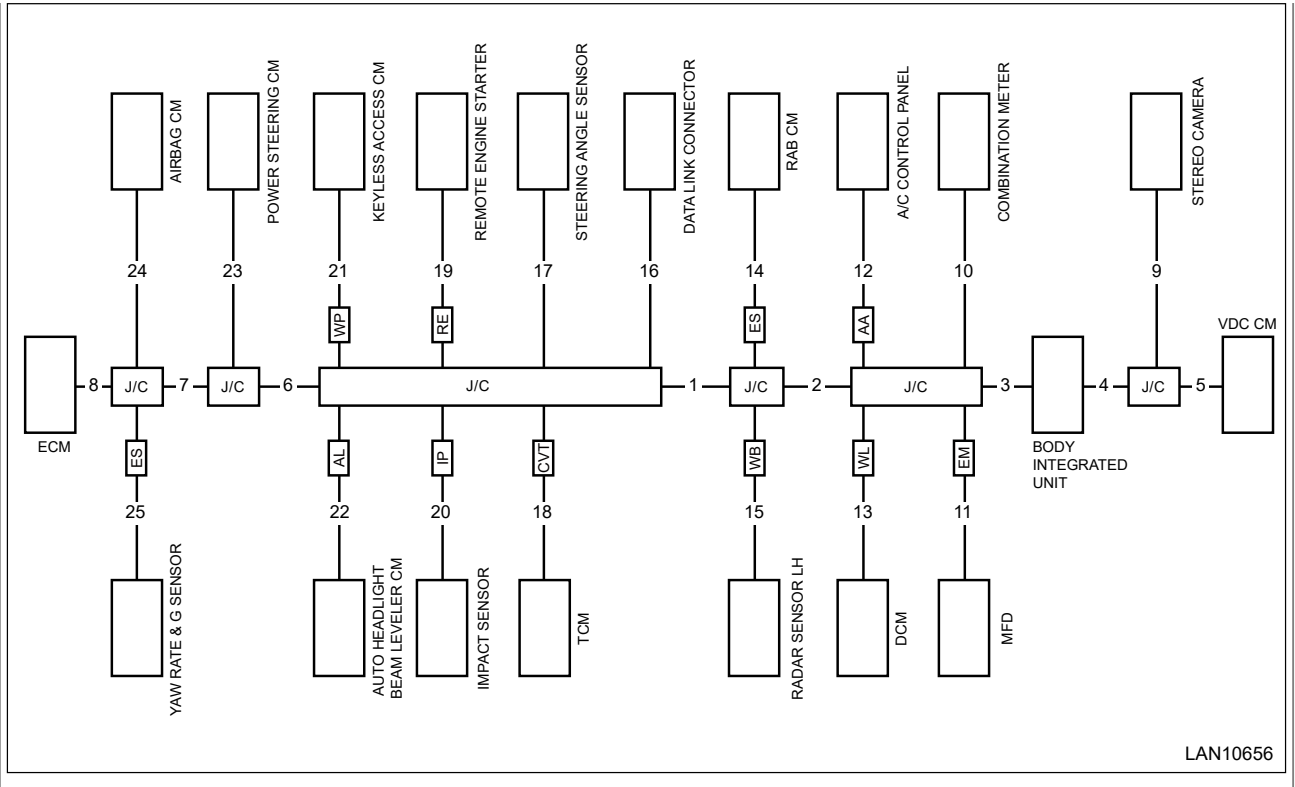
Perform the inspection using the check sheet of communication for initializing.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Subaru Select Monitor>COMMUNICATION FOR INITIALIZING IMPOSSIBLE > CHECK USING THE CHECK SHEET OF COMMUNICATION FOR INITIALIZING.](#)

1. CHECK USING THE CHECK SHEET OF COMMUNICATION FOR INITIALIZING

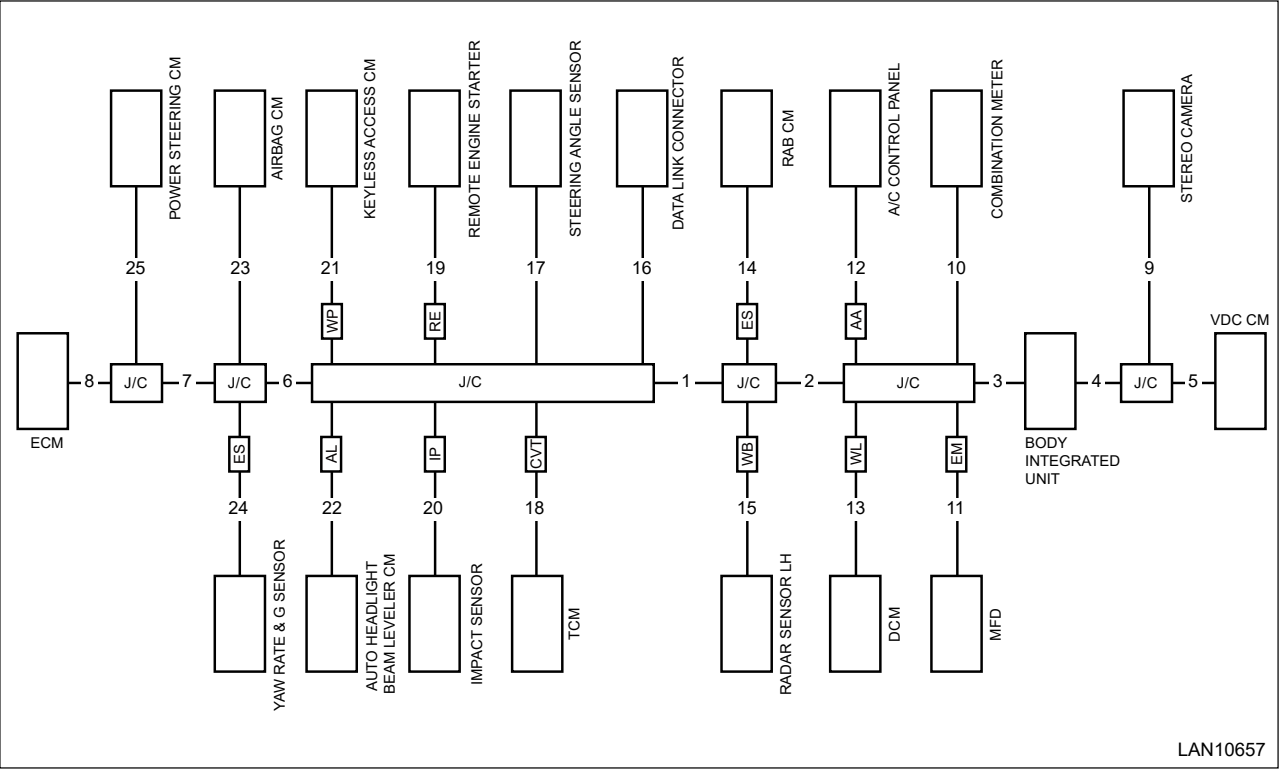
- Network diagram

Non-turbo model





Turbo model



- EM: With high grade MFD
- AA: With automatic air conditioner
- WL: With telematics
- EM: With high grade MFD
- ES: With EyeSight
- SR: With BSD/RCTA

CVT: CVT model

RE: With remote control engine starter

IP: With impact sensor

WP: CVT model

WP: With keyless access with push button start system

AL: With auto headlight beam leveler system

• **Check sheet of communication for initializing**

Non-turbo model

	(A)	(B)	(C)																									
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
VDC																												
CAM																												
BIU																												
MET																												
MFD																												
A/C																												
DCM																												
RAB																												
RAD																												
STR																												
TCM																												
RST																												
IMP																												
KPS																												
AHL																												
EPS																												
A/B																												
Y&G																												
ECM																												

LAN10658

Turbo model

(A)	(B)	(C)																								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25		

	(A)	(B)	(C)																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
VDC																											
CAM																											
BIU																											
MET																											
MFD																											
A/C																											
DCM																											
RAB																											
RAD																											
STR																											
TCM																											
RST																											
IMP																											
KPS																											
AHL																											
A/B																											
Y&G																											
EPS																											
ECM																											

LAN10659

- | | | |
|----------------------------------|-------------------------------------|-----------------------------------|
| (A) Installation check | VDC: VDC CM | TCM: Transmission CM |
| (B) Communication initialization | KPS: Keyless access CM | A/B: Airbag CM |
| (C) Wiring location | BIU: Body integrated unit | EPS: Power steering CM |
| | MFD: High grade MFD | ECM: Engine CM |
| | A/C: A/C control panel | CAM: Stereo camera |
| | MET: Combination meter | IMP: Impact sensor |
| | RST: Remote engine starter CM | Y & G: Yaw rate & G sensor |
| | AHL: Auto headlight beam leveler CM | DCM: Data communication module CM |
| | STR: Steering angle sensor | RAD: Radar sensor |
| | RAB: RAB CM | |

1. MODULE INSTALLATION CHECK.

1. Using the check sheet for communication for initializing, check the vehicle installation module (module targeted for CAN communication).
2. Write "-" marks in the field for installation check (A) if the vehicle to be inspected does not have relevant module.
3. Write "-" marks in all blank fields on the same row that the "-" mark has filled in.

Was the module installation check above performed?

[Go to 2.](#)

Perform the module installation check, [Go to 2.](#)

2. SUBARU SELECT MONITOR COMMUNICATION INITIALIZATION CHECK.




1. Connect the Subaru Select Monitor to the vehicle.
2. Check if communication with the module installed on the vehicle is possible.
3. Write "o" marks in the field for communication initialization (B) if the module succeeded in the communication for initializing with Subaru Select Monitor. If the module failed in the communication, write a "x".
4. Write "o" marks in all blank fields on the same row that the "o" mark has filled in.
5. When at least one field in a column of wiring location (C) is filled with the "o" mark, then the wiring for that location is normal. Write "o" marks in all blank fields on the same column that the "o" mark has filled in under the circled number.

Was the communication checked with all the modules installed on the vehicle?

Yes

 [Go to 3.](#)

No

Perform the communication check,  [Go to 3.](#)

3. CHECK FIELD FOR COMMUNICATION FOR INITIALIZING (B).



Check if communication with all the modules installed on the vehicle was possible.

Is "x" written in all the fields for communication for initializing (B)? (Was the communication not possible between all the modules and the Subaru Select Monitor?)

Yes

 [Go to 6.](#)

No

 [Go to 4.](#)

4. CHECK WIRING LOCATION OF MODULE THAT CANNOT PERFORM COMMUNICATION.



Using the check sheet for communication for initializing, check open circuit of the modules which have no "o" mark in their columns of the wiring location (C) in ascending order by referring to the network diagram.

Is CAN communication line faulty?

Yes

Repair or replace the faulty portion of the harness.

No

 [Go to 5.](#)

5. CHECK POWER SUPPLY CIRCUIT OF CONTROL MODULE.


Check power supply circuit of the control module that cannot perform communication. (Check the harness between control module connector and battery, and check the fuse.)

Is power supply circuit faulty?


Yes

Repair or replace the faulty portion of the power supply circuit.

No

Go to 5 in the Basic Diagnostic Procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

6. CHECK CAN COMMUNICATION LINE.


Check for short circuit to ground of CAN communication line.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check>INSPECTION > GROUND SHORT INSPECTION.](#)

Is CAN communication line faulty?


Yes

Repair or replace the faulty portion of the harness.

No

 [Go to 7.](#)

7. CHECK CAN COMMUNICATION LINE.

Check for short circuit to power supply of CAN communication line.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>CAN Communication Circuit Check>INSPECTION > BATTERY SHORT INSPECTION.](#)

Is CAN communication line faulty?


Yes

Repair or replace the faulty portion of the harness.

No


 [Go to 8.](#)


8. CHECK CAN COMMUNICATION LINE.

Check for short circuit between the CAN communication lines.  [Go to 8.](#)

Is CAN communication line faulty?

Repair or replace the faulty portion of the harness.


 [Go to 9.](#)


9. CHECK CAN COMMUNICATION LINE. 

Check the data link connector harness. (Check for open circuit of network diagram No. 16.)

Is CAN communication line faulty?

Repair or replace the faulty portion of the harness.

 [Go to 10.](#)

10. CHECK SUBARU SELECT MONITOR. 

Connect the Subaru Select Monitor to another vehicle to check whether the communication can be executed normally.

Is the Subaru Select Monitor OK?


It is possible that poor contact occurs at the data link connector.

The Subaru Select Monitor is faulty. Replace with a normal Subaru Select Monitor, and perform the diagnosis.

2. EXAMPLE OF WRITING FOR THE CHECK SHEET OF COMMUNICATION FOR INITIALIZING

NON-TURBO MODEL


When No. 1 is open



	(A)	(B)	(C)																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
VDC	<input type="radio"/>	<input checked="" type="checkbox"/>						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>								<input type="radio"/>		<input type="radio"/>			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
CAM	<input type="radio"/>	<input checked="" type="checkbox"/>																<input type="radio"/>									
BIU	<input type="radio"/>	<input checked="" type="checkbox"/>																<input type="radio"/>									
MET	<input type="radio"/>	<input checked="" type="checkbox"/>																<input type="radio"/>									
MFD	<input type="radio"/>	<input checked="" type="checkbox"/>																<input type="radio"/>									
A/C	<input type="radio"/>	<input checked="" type="checkbox"/>																<input type="radio"/>									
DCM	<input type="radio"/>	<input checked="" type="checkbox"/>																<input type="radio"/>									
RAB	<input type="radio"/>	<input checked="" type="checkbox"/>																<input type="radio"/>									
RAD	<input type="radio"/>	<input checked="" type="checkbox"/>																<input type="radio"/>									
STR	<input type="radio"/>	<input type="checkbox"/>																									
TCM	<input type="radio"/>	<input type="radio"/>																<input type="radio"/>		<input type="radio"/>							
RST	<input type="radio"/>	<input type="checkbox"/>																									
IMP	<input type="radio"/>	<input type="checkbox"/>																									
KPS	<input type="radio"/>	<input type="radio"/>																<input type="radio"/>						<input type="radio"/>			
AHL	<input type="radio"/>	<input type="radio"/>																<input type="radio"/>						<input type="radio"/>			
EPS	<input type="radio"/>	<input type="radio"/>						<input type="radio"/>										<input type="radio"/>							<input type="radio"/>		
A/B	<input type="radio"/>	<input type="radio"/>						<input type="radio"/>	<input type="radio"/>									<input type="radio"/>								<input type="radio"/>	
Y&G	<input type="radio"/>	<input type="checkbox"/>																									
ECM	<input type="radio"/>	<input type="radio"/>						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>								<input type="radio"/>									

LAN10660

When No. 2 is open



	(A)	(B)	(C)																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
VDC	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>					<input type="radio"/>	<input type="radio"/>	<input type="radio"/>								<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CAM	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>															<input type="radio"/>									
BIU	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>															<input type="radio"/>									
MET	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>															<input type="radio"/>									
MFD	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>															<input type="radio"/>									
A/C	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>															<input type="radio"/>									
DCM	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>															<input type="radio"/>									
RAB	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>															<input type="radio"/>		<input type="radio"/>							
RAD	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>															<input type="radio"/>	<input type="radio"/>								
STR	<input type="radio"/>	<input type="checkbox"/>																									
TCM	<input type="radio"/>	<input type="radio"/>																<input type="radio"/>		<input type="radio"/>							
RST	<input type="radio"/>	<input type="checkbox"/>																									
IMP	<input type="radio"/>	<input type="checkbox"/>																									
KPS	<input type="radio"/>	<input type="radio"/>																<input type="radio"/>						<input type="radio"/>			
AHL	<input type="radio"/>	<input type="radio"/>																<input type="radio"/>						<input type="radio"/>			
EPS	<input type="radio"/>	<input type="radio"/>						<input type="radio"/>										<input type="radio"/>							<input type="radio"/>		
A/B	<input type="radio"/>	<input type="radio"/>						<input type="radio"/>	<input type="radio"/>									<input type="radio"/>								<input type="radio"/>	
Y&G	<input type="radio"/>	<input type="checkbox"/>																									
ECM	<input type="radio"/>	<input type="radio"/>						<input type="radio"/>	<input type="radio"/>	<input type="radio"/>								<input type="radio"/>									

LAN10661


When No. 3 is open



	(A)	(B)	(C)																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
			○	○				○	○	○		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
VDC	○	X	○	○																							
CAM	○	X	○	○																							
BIU	○	X	○	○																							
MET	○	○	○	○								○															
MFD	○	○	○	○									○														
A/C	○	○	○	○										○													
DCM	○	○	○	○											○												
RAB	○	○	○													○											
RAD	○	○	○														○										
STR	○																	○									
TCM	○	○																○		○							
RST	○																										
IMP	○																										
KPS	○	○																○					○				
AHL	○	○																○						○			
EPS	○	○								○								○							○		
A/B	○	○								○	○							○								○	
Y&G	○																										
ECM	○	○								○	○	○						○									

LAN10662

When No. 4 is open



	(A)	(B)	(C)																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
			○	○	○			○	○	○		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
VDC	○	X	○	○	○																						
CAM	○	X	○	○	○																						
BIU	○	○	○	○	○																						
MET	○	○	○	○								○															
MFD	○	○	○	○									○														
A/C	○	○	○	○										○													
DCM	○	○	○	○											○												
RAB	○	○	○													○											
RAD	○	○	○														○										
STR	○																		○								
TCM	○	○																○		○							
RST	○																										
IMP	○																										
KPS	○	○																○					○				
AHL	○	○																○						○			
EPS	○	○								○								○							○		
A/B	○	○								○	○							○								○	
Y&G	○																										
ECM	○	○								○	○	○						○									

LAN10663

When No. 5 is open



	(A)	(B)	(C)																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
VDC	○	X	○	○	○	○		-	-	-	-	-	-	-	-	-	○	-	-	-	-	-	-	-	-	-	-
CAM	○	○	○	○	○	○	-	-	-	-	○	-	-	-	-	-	○	-	-	-	-	-	-	-	-	-	-
BIU	○	○	○	○	○	-	-	-	-	-	-	-	-	-	-	-	○	-	-	-	-	-	-	-	-	-	-
MET	○	○	○	○	-	-	-	-	-	-	○	-	-	-	-	-	○	-	-	-	-	-	-	-	-	-	-
MFD	○	○	○	○	-	-	-	-	-	-	-	○	-	-	-	-	○	-	-	-	-	-	-	-	-	-	-
A/C	○	○	○	○	-	-	-	-	-	-	-	-	○	-	-	-	○	-	-	-	-	-	-	-	-	-	-
DCM	○	○	○	○	-	-	-	-	-	-	-	-	-	○	-	-	○	-	-	-	-	-	-	-	-	-	-
RAB	○	○	○	-	-	-	-	-	-	-	-	-	-	-	○	-	○	-	-	-	-	-	-	-	-	-	-
RAD	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-	○	○	-	-	-	-	-	-	-	-	-	-
STR	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TCM	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	○	-	○	-	-	-	-	-	-	-	-
RST	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IMP	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KPS	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	○	-	-	-	-	-	○	-	-	-	-
AHL	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	○	-	-	-	-	-	○	-	-	-	-
EPS	○	○	-	-	-	-	-	○	-	-	-	-	-	-	-	-	○	-	-	-	-	-	-	○	-	-	-
A/B	○	○	-	-	-	-	-	○	○	-	-	-	-	-	-	-	○	-	-	-	-	-	-	-	○	-	-
Y&G	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ECM	○	○	-	-	-	-	-	○	○	○	-	-	-	-	-	-	○	-	-	-	-	-	-	-	-	-	-

LAN10664

When No. 6 is open

	(A)	(B)	(C)																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
VDC	○	○	○	○	○	○	-	-	-	-	-	-	-	-	-	-	○	-	-	-	-	-	-	-	-	-	-
CAM	○	○	○	○	○	○	-	-	-	-	○	-	-	-	-	-	○	-	-	-	-	-	-	-	-	-	-
BIU	○	○	○	○	○	-	-	-	-	-	-	-	-	-	-	-	○	-	-	-	-	-	-	-	-	-	-
MET	○	○	○	○	-	-	-	-	-	-	○	-	-	-	-	-	○	-	-	-	-	-	-	-	-	-	-
MFD	○	○	○	○	-	-	-	-	-	-	-	○	-	-	-	-	○	-	-	-	-	-	-	-	-	-	-
A/C	○	○	○	○	-	-	-	-	-	-	-	-	○	-	-	-	○	-	-	-	-	-	-	-	-	-	-
DCM	○	○	○	○	-	-	-	-	-	-	-	-	-	○	-	-	○	-	-	-	-	-	-	-	-	-	-
RAB	○	○	○	-	-	-	-	-	-	-	-	-	-	-	○	-	○	-	-	-	-	-	-	-	-	-	-
RAD	○	○	○	-	-	-	-	-	-	-	-	-	-	-	-	○	○	-	-	-	-	-	-	-	-	-	-
STR	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TCM	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	○	-	○	-	-	-	-	-	-	-	-
RST	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IMP	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KPS	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	○	-	-	-	-	-	○	-	-	-	-
AHL	○	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	○	-	-	-	-	-	○	-	-	-	-
EPS	○	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	○	-	-	-	-	-	-	-	-	-	-
A/B	○	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	○	-	-	-	-	-	-	-	-	-	-
Y&G	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ECM	○	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	○	-	-	-	-	-	-	-	-	-	-

LAN10665

When No. 7 is open

When No. 13 is open



	(A)	(B)	(C)																									
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
VDC	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
CAM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
MET	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
MFD	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
A/C	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
DCM	○	X	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RAB	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RAD	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
STR	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TCM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RST	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
IMP	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
KPS	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
AHL	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
EPS	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
A/B	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Y&G	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
ECM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

LAN10672

When No. 14 is open



Perform the inspection from step 6 using the check sheet of communication for initializing. (There may be a malfunction other than open circuit)  [Go to 6.](#)


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	(A)	(B)	(C)																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
VDC	<input type="radio"/>	X					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CAM	<input type="radio"/>	X				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BIU	<input type="radio"/>	X			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MET	<input type="radio"/>	X		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MFD	<input type="radio"/>	X		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A/C	<input type="radio"/>	X		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DCM	<input type="radio"/>	X		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RAB	<input type="radio"/>	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RAD	<input type="radio"/>	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
STR	<input type="radio"/>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TCM	<input type="radio"/>	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RST	<input type="radio"/>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IMP	<input type="radio"/>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KPS	<input type="radio"/>	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AHL	<input type="radio"/>	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPS	<input type="radio"/>	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A/B	<input type="radio"/>	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y&G	<input type="radio"/>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ECM	<input type="radio"/>	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-


LAN10675

When No. 17 is open

Note:

The case of open circuit of No. 19, 20, 25 has no difference. However, determination is possible through the difference in the data no-receive detection condition of each module.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\)>LIST > EXAMPLE OF DTC DATA NOT RECEIVED.](#)

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The case of open circuit of No. 17, 20, 25 has no difference. However, determination is possible through the difference in the data no-receive detection condition of each module.  Ref. to LAN SYSTEM (DIAGNOSTICS)>List of Diagnostic Trouble Code (DTC)>LIST > EXAMPLE OF DTC DATA NOT RECEIVED.


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	(A)	(B)	(C)																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
VDC	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
CAM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
MET	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
MFD	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
A/C	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
DCM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RAB	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RAD	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
STR	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TCM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RST	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
IMP	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
KPS	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
AHL	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
EPS	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
A/B	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Y&G	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
ECM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

LAN10676

When No. 20 is open

Note:

The case of open circuit of No. 17, 19, 25 has no difference. However, determination is possible through the difference in the data no-receive detection condition of each module.  Ref. to LAN SYSTEM (DIAGNOSTICS)>List of Diagnostic Trouble Code (DTC)>LIST > EXAMPLE OF DTC DATA NOT RECEIVED.


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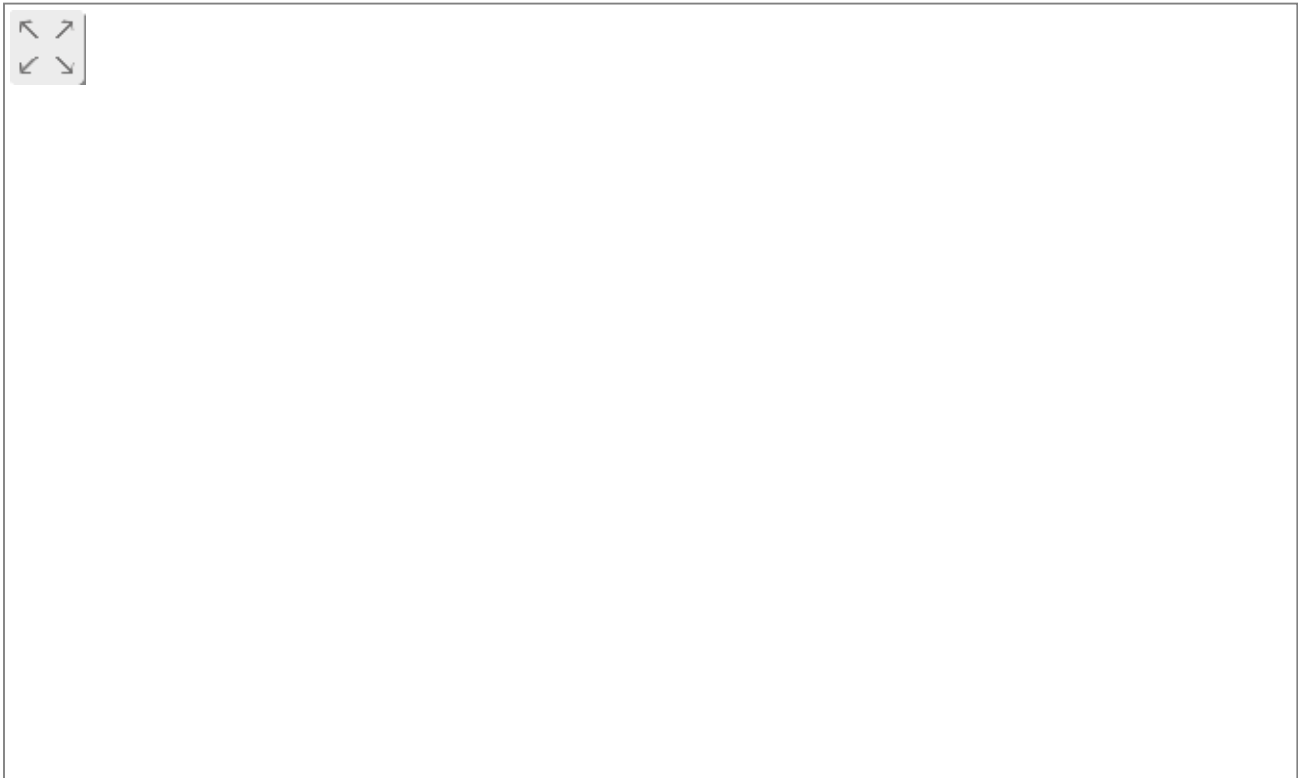
	(A)	(B)	(C)																									
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
VDC	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
CAM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
MET	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
MFD	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
A/C	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
DCM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RAB	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RAD	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
STR	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TCM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RST	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
IMP	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
KPS	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
AHL	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
EPS	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
A/B	○	X	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Y&G	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
ECM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

LAN10681

When No. 25 is open

Note:

The case of open circuit of No. 17, 19, 20 has no difference. However, determination is possible through the difference in the data no-receive detection condition of each module.  Ref. to LAN SYSTEM (DIAGNOSTICS)>List of Diagnostic Trouble Code (DTC)>LIST > EXAMPLE OF DTC DATA NOT RECEIVED.




	(A)	(B)	(C)																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
VDC	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
CAM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
MET	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
MFD	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
A/C	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
DCM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RAB	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RAD	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
STR	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TCM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RST	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
IMP	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
KPS	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
AHL	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
EPS	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
A/B	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Y&G	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
ECM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

LAN10676

TURBO MODEL

When No. 1 is open



	(A)	(B)	(C)																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
VDC	○	X																									
CAM	○	X																									
BIU	○	X																									
MET	○	X																									
MFD	○	X																									
A/C	○	X																									
DCM	○	X																									
RAB	○	X																									
RAD	○	X																									
STR	○																										
TCM	○	○																									
RST	○																										
IMP	○																										
KPS	○	○																									
AHL	○	○																									
A/B	○	○																									
Y&G	○																										
EPS	○	○																									
ECM	○	○																									

LAN10682

When No. 2 is open





	(A)	(B)	(C)																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
			○					○	○	○						○	○	○	○	○	○	○	○	○	○	○	○
VDC	○	X	○					○	○	○																	
CAM	○	X	○																								
BIU	○	X	○																								
MET	○	X	○																								
MFD	○	X	○																								
A/C	○	X	○																								
DCM	○	X	○																								
RAB	○	○	○																								
RAD	○	○	○																								
STR	○	○	○																								
TCM	○	○	○																								
RST	○	○	○																								
IMP	○	○	○																								
KPS	○	○	○																								
AHL	○	○	○																								
A/B	○	○	○																								
Y&G	○	○	○																								
EPS	○	○	○																								
ECM	○	○	○																								

LAN10683

When No. 3 is open



	(A)	(B)	(C)																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
			○	○				○	○	○						○	○	○	○	○	○	○	○	○	○	○	○
VDC	○	X	○	○				○	○	○																	
CAM	○	X	○	○																							
BIU	○	X	○	○																							
MET	○	○	○	○																							
MFD	○	○	○	○																							
A/C	○	○	○	○																							
DCM	○	○	○	○																							
RAB	○	○	○																								
RAD	○	○	○																								
STR	○	○	○																								
TCM	○	○	○																								
RST	○	○	○																								
IMP	○	○	○																								
KPS	○	○	○																								
AHL	○	○	○																								
A/B	○	○	○																								
Y&G	○	○	○																								
EPS	○	○	○																								
ECM	○	○	○																								

LAN10684

When No. 4 is open

When No. 8 is open



	(A)	(B)	(C)																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
VDC	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
CAM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
MET	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
MFD	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
A/C	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
DCM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RAB	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RAD	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
STR	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TCM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RST	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
IMP	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
KPS	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
AHL	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
A/B	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Y&G	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
EPS	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
ECM	○	X	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

LAN10689

When No. 9 is open





	(A)	(B)	(C)																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
VDC	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
CAM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
MET	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
MFD	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
A/C	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
DCM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RAB	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RAD	○	X	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
STR	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TCM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RST	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
IMP	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
KPS	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
AHL	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
A/B	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Y&G	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
EPS	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
ECM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

LAN10696

When No. 16 is open

Note:

Perform the inspection from step 6 using the check sheet of communication for initializing. (There may be a malfunction other than open circuit)  [Go to 6.](#)




	(A)	(B)	(C)																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
VDC	<input type="radio"/>	<input checked="" type="checkbox"/>						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CAM	<input type="radio"/>	<input checked="" type="checkbox"/>						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BIU	<input type="radio"/>	<input checked="" type="checkbox"/>						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MET	<input type="radio"/>	<input checked="" type="checkbox"/>						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MFD	<input type="radio"/>	<input checked="" type="checkbox"/>						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A/C	<input type="radio"/>	<input checked="" type="checkbox"/>						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DCM	<input type="radio"/>	<input checked="" type="checkbox"/>						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RAB	<input type="radio"/>	<input checked="" type="checkbox"/>						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RAD	<input type="radio"/>	<input checked="" type="checkbox"/>						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
STR	<input type="radio"/>	<input checked="" type="checkbox"/>						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TCM	<input type="radio"/>	<input checked="" type="checkbox"/>						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RST	<input type="radio"/>	<input checked="" type="checkbox"/>						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IMP	<input type="radio"/>	<input checked="" type="checkbox"/>						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KPS	<input type="radio"/>	<input checked="" type="checkbox"/>						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AHL	<input type="radio"/>	<input checked="" type="checkbox"/>						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
A/B	<input type="radio"/>	<input checked="" type="checkbox"/>						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y&G	<input type="radio"/>	<input checked="" type="checkbox"/>						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EPS	<input type="radio"/>	<input checked="" type="checkbox"/>						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ECM	<input type="radio"/>	<input checked="" type="checkbox"/>						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-


LAN10697

When No. 17 is open

Note:

The case of open circuit of No. 19, 20, 24 has no difference. However, determination is possible through the difference in the data no-receive detection condition of each module.  Ref. to LAN SYSTEM (DIAGNOSTICS)>List of Diagnostic Trouble Code (DTC)>LIST > EXAMPLE OF DTC DATA NOT RECEIVED.



The case of open circuit of No. 17, 20, 24 has no difference. However, determination is possible through the difference in the data no-receive detection condition of each module.  Ref. to LAN SYSTEM (DIAGNOSTICS)>List of Diagnostic Trouble Code (DTC)>LIST > EXAMPLE OF DTC DATA NOT RECEIVED.


↶ ↷
↵ ↘

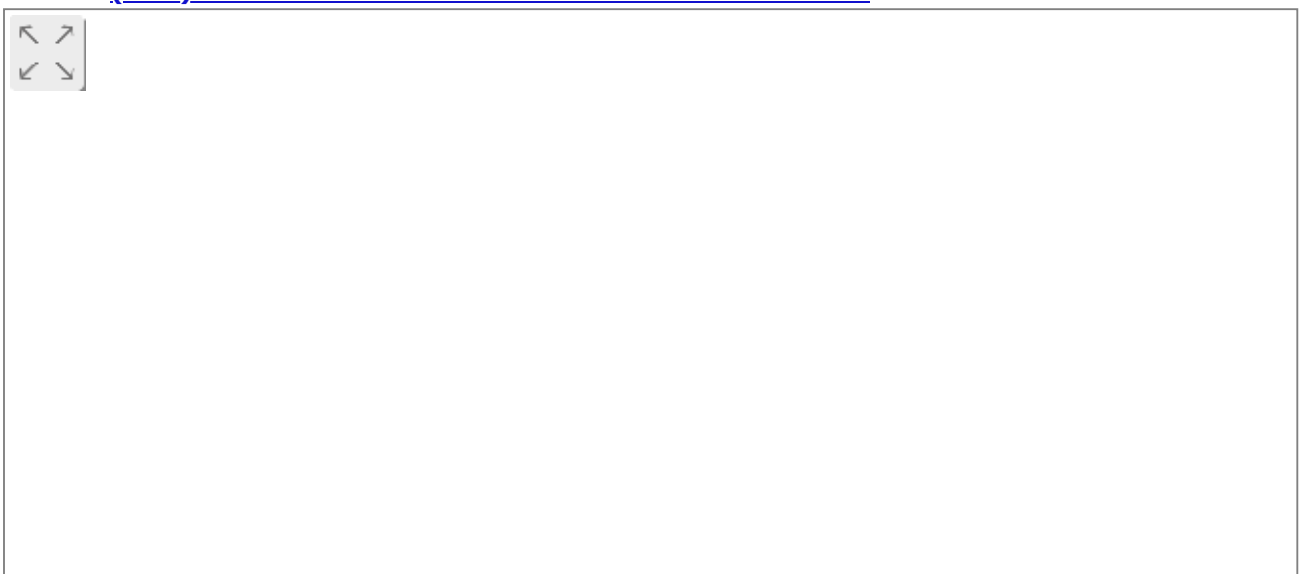
	(A)	(B)	(C)																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
VDC	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
CAM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
MET	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
MFD	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
A/C	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
DCM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RAB	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RAD	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
STR	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TCM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RST	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
IMP	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
KPS	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
AHL	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
A/B	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Y&G	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
EPS	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
ECM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○


LAN10698

When No. 20 is open

Note:

The case of open circuit of No. 17, 19, 24 has no difference. However, determination is possible through the difference in the data no-receive detection condition of each module.  Ref. to LAN SYSTEM (DIAGNOSTICS)>List of Diagnostic Trouble Code (DTC)>LIST > EXAMPLE OF DTC DATA NOT RECEIVED.



The case of open circuit of No. 17, 19, 20 has no difference. However, determination is possible through the difference in the data no-receive detection condition of each module.  Ref. to LAN SYSTEM (DIAGNOSTICS)>List of Diagnostic Trouble Code (DTC)>LIST > EXAMPLE OF DTC DATA NOT RECEIVED.

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	(A)	(B)	(C)																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
VDC	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
CAM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
BIU	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
MET	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
MFD	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
A/C	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
DCM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
RAB	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
RAD	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
STR	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
TCM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
RST	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
IMP	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
KPS	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
AHL	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
A/B	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Y&G	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
EPS	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
ECM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	

LAN10698

When No. 25 is open

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	(A)	(B)	(C)																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
VDC	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
CAM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
MET	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
MFD	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
A/C	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
DCM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RAB	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RAD	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
STR	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TCM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
RST	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
IMP	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
KPS	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
AHL	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
A/B	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Y&G	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
EPS	○	X	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
ECM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

LAN SYSTEM (DIAGNOSTICS) > Subaru Select Monitor

OPERATION

For detailed operation procedures, refer to "Application help".

PROCEDURE

1. PERFORM CUSTOMER INTERVIEW.



Using the Check List for Interview, ask the customer the condition of how trouble occurs.

[Ref. to MULTI-FUNCTION DISPLAY\(DIAGNOSTICS\)>Check List for Interview.](#)

Did you interview the customer?

Yes

[Go to 2.](#)

No

Interview the customer. [Ref. to MULTI-FUNCTION DISPLAY\(DIAGNOSTICS\)>Check List for Interview.](#)

2. CHECK CAN COMMUNICATION.



Read the DTC of the CAN system using the Subaru Select Monitor. [Ref. to MULTI-FUNCTION DISPLAY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes

Perform the diagnosis for the displayed DTCs. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\)>LIST.](#)

No

[Go to 3.](#)

3. CHECK MFD.



Read the DTC relating the MFD using the Subaru Select Monitor. [Ref. to MULTI-FUNCTION DISPLAY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?


Yes

Record the DTCs and time stamps, and perform the diagnosis for the displayed DTCs. [Ref. to MULTI-FUNCTION DISPLAY\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

Note:


For time stamp, refer to "LAN SYSTEM". [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>General Description>CAUTION > TIME STAMP.](#)

No

 [Go to 4.](#)

4. CHECK MFD.




Check the MFD display using the active test of combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Active Test.](#)

Is the check result OK?

Yes

System is normal.

No

Replace the MFD.  [Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display_\(MFD\).](#)

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Check List for Interview

CHECK

- Inspect the following items regarding the vehicle’s state.
- Print out this page for interviewing customers.



MFD Check List for Interview		Date the Vehicle is Received	Year
Month	Day		
Customer’s name		Registration No.	Initial year of registration Year Month Date
		Vehicle model	Frame number
Interviewer	Inspector	Engine type	Odometer reading
Customer specified content • • •			
Date and time when the trouble occurred		Frequency of trouble occurrence	Always occurs Sometimes occurs (times per day, times per month)
Condition of trouble occurrence (How the trouble occurs)		Weather	Fine • Cloudy • Rainy • Snowy • Others ()
		Temperature	°C (°F) — °C (°F)
Road conditions		Occurrence location	
Accessory installation condition			
Confirmation of trouble condition			
<input type="checkbox"/> MFD			
<input type="checkbox"/> Diagnostic code			

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Clear memory

OPERATION

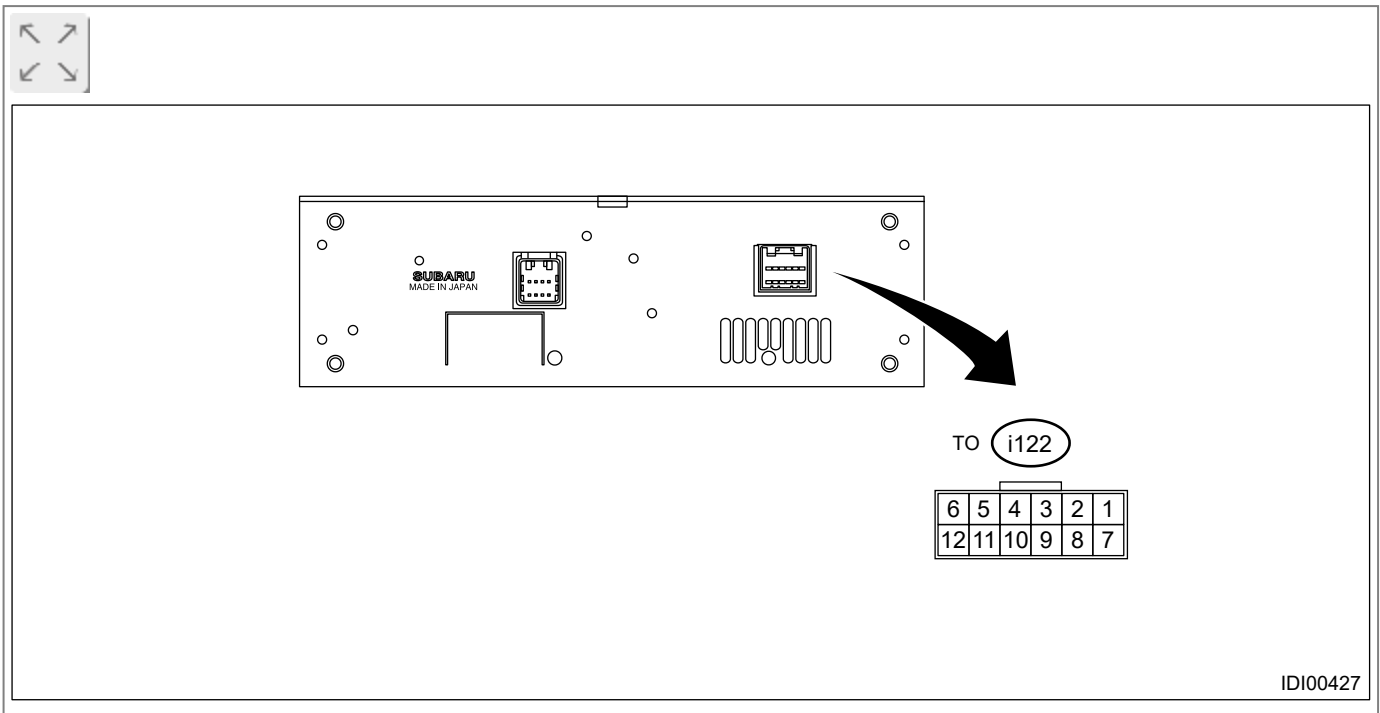
1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Multi-function Display], and then select [Enter].
5. On [Select Function] display, select [DTC].
6. On [DTC] display, select [Clear memory].

Note:

For detailed operation procedures, refer to "Application help".

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Control Module I/O Signal

ELECTRICAL SPECIFICATION



Terminal No.	Content	Measuring condition	Standard
1 (+B) ↔ Chassis ground	Battery power supply	Always	10 – 14 V
2 (GND) ↔ Chassis ground	GND	Always	Less than 1 Ω
3 (IGN) ↔ Chassis ground	Ignition power supply	IG OFF → ON	0 V → 10 – 14 V
4 (STR-) ↔ Chassis ground	Steering switch communication line (-)	Cannot be measured	—
5 (CAN-) ↔ Chassis ground	CAN communication line (-)	Cannot be measured	—
6 (CAN+) ↔ Chassis ground	CAN communication line (+)	Cannot be measured	—
7	—	—	—
8	—	—	—
9 (UART) ↔ Chassis ground	UART (meter communication line)	Cannot be measured	—
10 ↔ Chassis ground	Passenger's airbag ON	Passenger's airbag ON indicator (when illuminating)	Less than 1 V
11 ↔ Chassis ground	Passenger's airbag OFF	Passenger's airbag OFF indicator (when illuminating)	Less than 1 V
12 (STR+) ↔	Steering switch communication	Cannot be measured	—

Chassis ground

line (+)

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Data Monitor

LIST

Items to be displayed	Unit of measure	Content	Note
MFD hardware fail flag	Normal / MFD Fail		—
MFD U-ART communication error flag	Normal / MFD U-ART Fail		—
MFD CAN communication error flag	Normal / MFD CAN Fail		—
MFD destination abnormal flag	Normal / MFD destination error		—
MFD failure information	No error High-speed CAN error counter abnormal High-speed CAN bus OFF detection High-speed CAN data abnormal High-speed CAN data not received UART data abnormal UART data not received Break the wire of IGN System Microcomputer fail GERDA Malfunction		MFD abnormal status
Birthday1 setting M	—	Birthday setting value	—
Birthday1 setting D	—		—
Birthday2 setting M	—	Birthday setting value	—
Birthday2 setting D	—		—
Anniversary1 setting M	—	Anniversary setting value	—
Anniversary1 setting D	—		—
Anniversary2 setting M	—	Anniversary setting value	—
Anniversary2 setting D	—		—
Driving record1 setting Yard	—	Driving record 1 setting value	—
Driving record1 setting Time	—		—
Driving record1 setting fuel cons. Ave.	—		—
Driving record1 setting M	—		—
Driving record1 setting D	—		—
Driving record2 setting DIS	—		Driving record 2 setting

Driving record2 setting Time	—	value	—
Driving record2setting fuel cons. Ave.	—		—
Driving record2 setting M	—		—
Driving record2 setting D	—		—
Clock/OFF setting	OFF External air temperature + analog clock External air temperature + digital clock	Clock display setting	—
Engine oil maintenance setting Y	—	Oil maintenance setting value	—
Engine oil maintenance setting M	—		—
Engine oil maintenance setting D	—		—
Engine oil maintenance setting meter	—		—
Oil filter maintenance setting Y	—	Oil filter maintenance setting value	—
Oil filter maintenance setting M	—		—
Oil filter maintenance setting D	—		—
Oil filter maintenance setting meter	—		—
Tire maintenance setting Y	—	Tire maintenance setting value	—
Tire maintenance setting M	—		—
Tire maintenance setting D	—		—
Tire maintenance setting meter	—		—
Maintenance schedule Y	—	Periodic inspection setting value	—
Maintenance schedule M	—		—
Maintenance schedule D	—		—
Maintenance schedule meter	—		—
Sub-meter(left) setting NO1	Indication OFF Avg. Speed ODO fuel efficiency ECVT Fluid Temp. Accel. Opening Angle Section time Section distance Section fuel efficiency	Meter display setting	—
Sub-meter(left) setting NO2	Analog display Digital display	Meter display setting	—
Sub-meter(center) setting NO1	Indication OFF Avg. Speed	Meter display setting	—

	ODO fuel efficiency ECVT Fluid Temp. Accel. Opening Angle Section time Section distance Section fuel efficiency		
Sub-meter(center) setting NO2	Analog display Digital display	Meter display setting	—
Sub-meter(right) setting NO1	Indication OFF Avg. Speed ODO fuel efficiency ECVT Fluid Temp. Accel. Opening Angle Section time Section distance Section fuel efficiency	Meter display setting	—
Sub-meter(right) setting NO2	Analog display Digital display	Meter display setting	—
MFD brightness setting NO1	—	MFD setting	—
MFD brightness setting NO2	—	MFD setting	—
MFD contrast setting NO1	-5 — +5	MFD setting	—
MFD contrast setting NO2	-5 — +5	MFD setting	—
ECO evaluation ON-OFF setting	OFF / ON	MFD setting	—
Info area setting	OFF Average Fuel Efficiency FUEL CONS Range	MFD setting	—
Menu language setting	(Individual language)	MFD setting	—
Buzzer volume setting	OFF Small Big	MFD setting	—
Fuel cons. Setting	00/OFF	MFD setting	—
Auto Start Stop interrupt display setting	OFF / ON	MFD setting	Not applicable
Welcome display ON-OFF setting	OFF / ON	MFD setting	—
Self check ON-OFF setting	OFF / ON	MFD setting	—

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Data Monitor

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Multi-function Display], and then select [Enter].
5. On [Select Function] display, select [Data monitor].

Note:

For detailed operation procedures, refer to "Application help".

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2223 GERDA MALFUNCTION

DTC DETECTING CONDITION:

When the system microcomputer can not send/receive the data with the image microcomputer normally.

TROUBLE SYMPTOM:

There is no display on the TFT. Operation is normal.

Note:

Replace the MFD.  [Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display_\(MFD\).](#)

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

Detected when CAN line abnormality is detected.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1201 CAN-HS COUNTER ABNORMAL

Detected when CAN data is abnormal.

Note:


Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1235 LOST COMMUNICATION WITH EYESIGHT

Detected when CAN data from the stereo camera does not arrive.

Note:

Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1650 INVALID DATA RECEIVED FROM METER (UART)

DTC detecting condition:

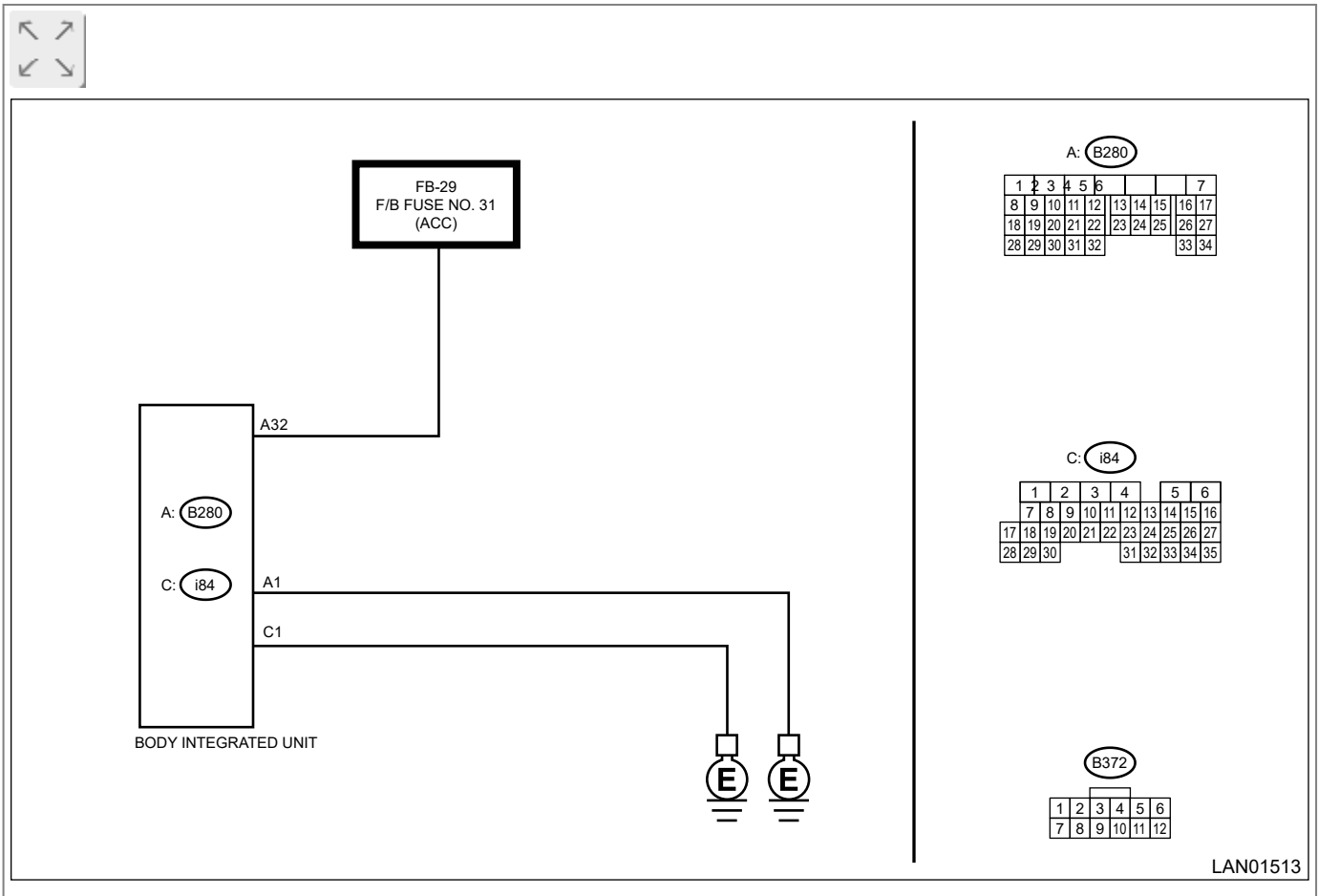
There is an abnormality in UART data from combination meter.

Trouble symptom:



LCD is not displayed.

Wiring diagram:

Clearance Light and Illumination Light System  [Ref. to WIRING SYSTEM>Clearance Light and Illumination Light System.](#)



1. CHECK LAN SYSTEM.


Read the DTC of body integrated unit and LAN system using Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is any DTC other than DTC U1650 displayed?

Yes

Perform the diagnosis of DTCs other than U1650.

No


 [Go to 2.](#)

2. CHECK FUSE.

Check the fuse No. 31 in the fuse & relay box.

Is the check result OK?

Yes

 [Go to 3.](#)

No

Replace the fuse. When the fuse is blown easily, check the wiring.

3. CHECK HARNESS (POWER SUPPLY CIRCUIT).

1. Disconnect the body integrated unit connector.
2. Turn the ignition switch OFF → ACC.
3. Measure the voltage between body integrated unit connector and chassis ground using tester.

Connector & terminal

(B280) No. 32 (+) — Chassis ground (-):

Is the voltage 10 V or more?


Yes

 [Go to 4.](#)

No

Repair the ACC power supply circuit of the body integrated unit.

4. CHECK DATA MONITOR FOR BODY INTEGRATED UNIT.

1. Connect the Subaru Select Monitor.
2. Turn the ignition switch to ON.
3. Check the data monitor [ACC voltage] of body integrated unit.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Data Monitor.](#)

Is the voltage 10 V or more?

Yes

 [Go to 5.](#)

No

Inspect and correct the body integrated unit connector. If there is no

abnormality, replace the body integrated unit. [🔗 Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)(There may be a poor contact in the body integrated unit connector ((B280) terminal No. 32), or an internal malfunction of the integrated unit.) (If the data monitor indicates ACC voltage value \approx Battery voltage, there will be no malfunction up to inside of the integrated unit. If U1650 is still detected in this condition as current malfunction, perform step 5 and subsequent procedures.)

5. CHECK CONNECTOR.

1. Disconnect the MFD connector and the combination meter connector.
2. Connect the disconnected connectors.
3. Read the DTC relating the MFD using the Subaru Select Monitor. [🔗 Ref. to MULTI-FUNCTION DISPLAY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U1650 displayed? (Current malfunction)

Yes

[🔗 Go to 6.](#)

No

There was poor contact of connector. Repair the poor contact of connector. (Poor contact in combination connector (i10) terminal No. 20 or MFD connector (i122) terminal No. 9)

6. CHECK COMBINATION METER.

1. Replace the combination meter. [🔗 Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)
2. Read the DTC relating the MFD using the Subaru Select Monitor. [🔗 Ref. to MULTI-FUNCTION DISPLAY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U1650 displayed? (Current malfunction)

Yes

Replace the MFD. [🔗 Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display \(MFD\) System.](#)

No

There was something wrong with the combination meter.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1651 LOST COMMUNICATION WITH METER (UART)

DTC detecting condition:

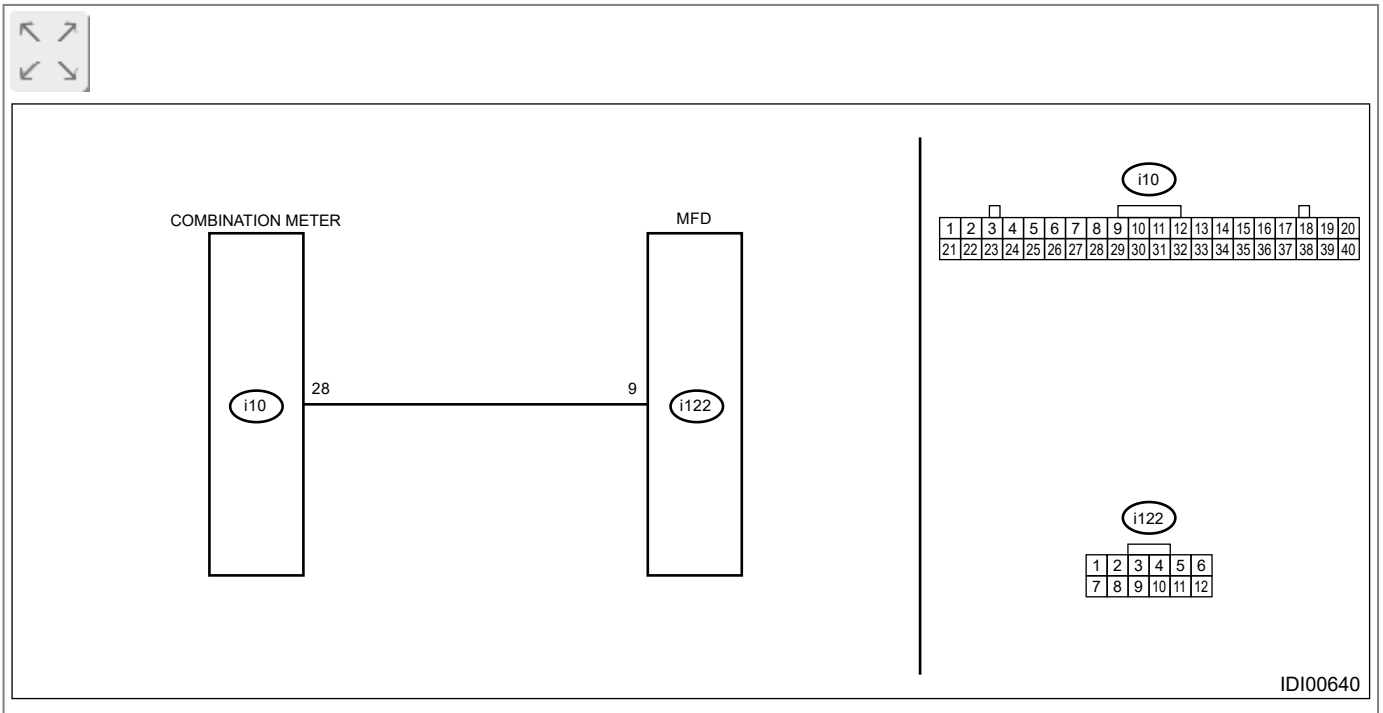
UART data from combination meter is not received.

Trouble symptom:


LCD is not displayed.

Wiring diagram:


Multi-function display (MFD) system  [Ref. to WIRING SYSTEM>Multi-function Display_\(MFD\) System>WIRING DIAGRAM.](#)




1. CHECK LAN SYSTEM.

Read the DTC of the LAN system using the Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC for LAN system displayed?


- Yes Perform the diagnosis of DTCs for LAN system.
- No  [Go to 2.](#)

2. CHECK CONNECTOR.

1. Disconnect the MFD connector and combination meter connector.
2. Connect the disconnected connectors.
3. Read the DTC relating the MFD using the Subaru Select Monitor.  [Ref. to MULTI-FUNCTION DISPLAY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U1651 displayed? (Current malfunction)

Yes

 [Go to 3.](#)

No

There was poor contact of connector.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the MFD connector and combination meter connector.
2. Using the tester, measure the resistance between terminals.

Connector & terminal

(i10) No. 28 — (i122) No. 9:

Is the resistance 10 Ω or less?

Yes

 [Go to 4.](#)

No

Repair the open circuit of harness or replace harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using the tester, measure the resistance between terminals.

Connector & terminal

(i122) No. 9 — Chassis ground:

Is the resistance 10 Ω or less?


Yes


Repair the short circuit of harness or replace harness.

No

 [Go to 5.](#)


5. CHECK COMBINATION METER.

1. Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

2. Read the DTC relating the MFD using the Subaru Select Monitor.  [Ref. to MULTI-FUNCTION DISPLAY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U1651 displayed? (Current malfunction)



Yes

 [Go to 6.](#)

No


There was something wrong with the combination meter.

6. CHECK COMBINATION METER.

1. Replace the current combination meter with the original combination meter.
2. Replace the MFD.  [Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display \(MFD\).](#)
3. Read the DTC relating the MFD using the Subaru Select Monitor.  [Ref. to MULTI-FUNCTION DISPLAY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U1651 displayed? (Current malfunction)

Yes

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

No


There was an abnormality in MFD.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

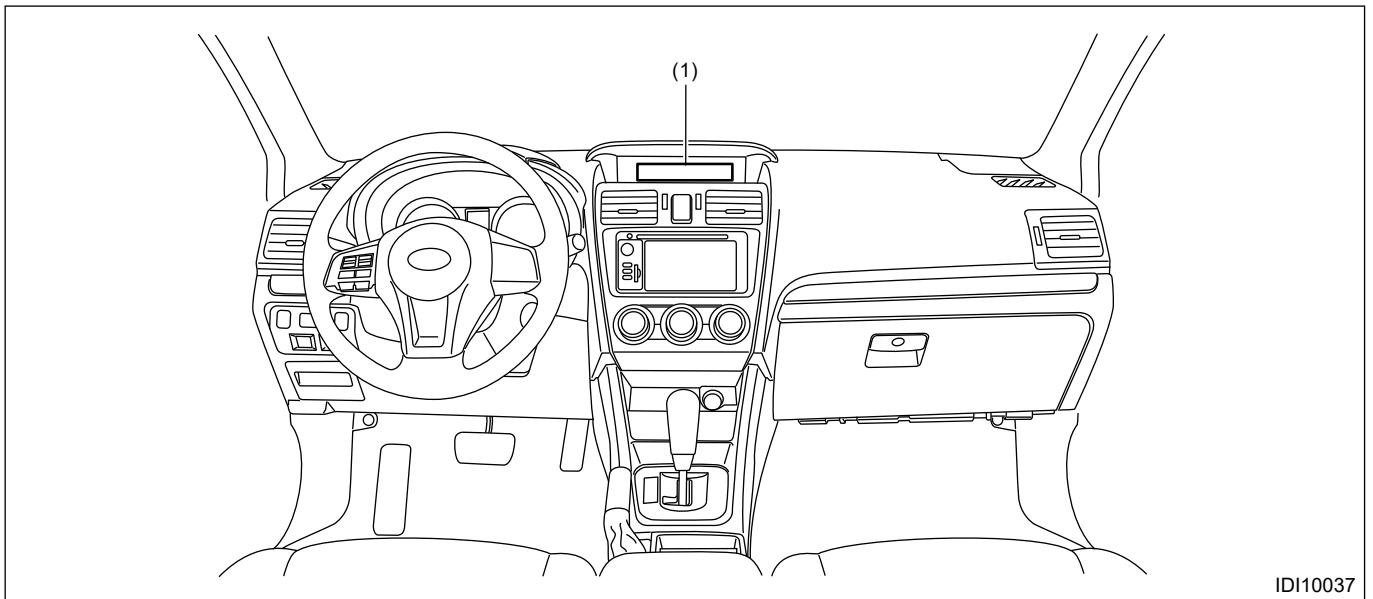
1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Multi-function Display], and then select [Enter].
5. On [Select Function] display, select [DTC].

Note:

- For detailed operation procedures, refer to "Application help".
- For details concerning DTC, refer to "List of Diagnostic Trouble Code (DTC)".
 [Ref. to MULTI-FUNCTION DISPLAY\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Electrical Component Location

LOCATION



IDI10037

(1) MFD

CAUTION

1. AIRBAG SYSTEM




Caution:

- **Do not use the electrical test equipment on the airbag system wiring harnesses and connector circuits.**
- **Be careful not to damage the airbag system wiring harness.**

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > General Description

INSPECTION


Before performing diagnosis, check the following items that might provoke the problems related to the combination meter or MFD.

- 1.** Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)  [Ref. to STARTING/CHARGING SYSTEMS\(H4DOTC\)>General Description.](#)
- 2.** Check the fuse condition.  [Ref. to INSTRUMENTATION/DRIVER INFO>Relay and Fuse.](#)
- 3.** Check the connecting condition of harness and harness connector.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL







ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	— (Newly adopted tool)	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > List of Diagnostic Trouble Code (DTC)

LIST

DTC	Item	Content	Reference
B2223	GERDA MALFUNCTION	When the system microcomputer can not send/receive the data with the image microcomputer normally.	 Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2223 GERDA MALFUNCTION.
U0073	CONTROL MODULE COMMUNICATION BUS OFF	Detected when CAN line abnormality is detected.	 Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC).
U1201	CAN-HS COUNTER ABNORMAL	Detected when CAN data is abnormal.	 Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1201 CAN-HS COUNTER ABNORMAL.
U1235	LOST COMMUNICATION WITH EyeSight	Detected when CAN data from the stereo camera does not arrive.	 Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1235 LOST COMMUNICATION WITH EyeSight.
U1650	INVALID DATA RECEIVED FROM METER (UART)	There is an abnormality in UART data from combination meter.	 Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1650 INVALID DATA RECEIVED FROM METER (UART).
U1651	LOST COMMUNICATION WITH METER (UART)	UART data from combination meter is not received.	 Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1651 LOST COMMUNICATION WITH METER (UART).

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Subaru Select Monitor

INSPECTION



Detecting condition:

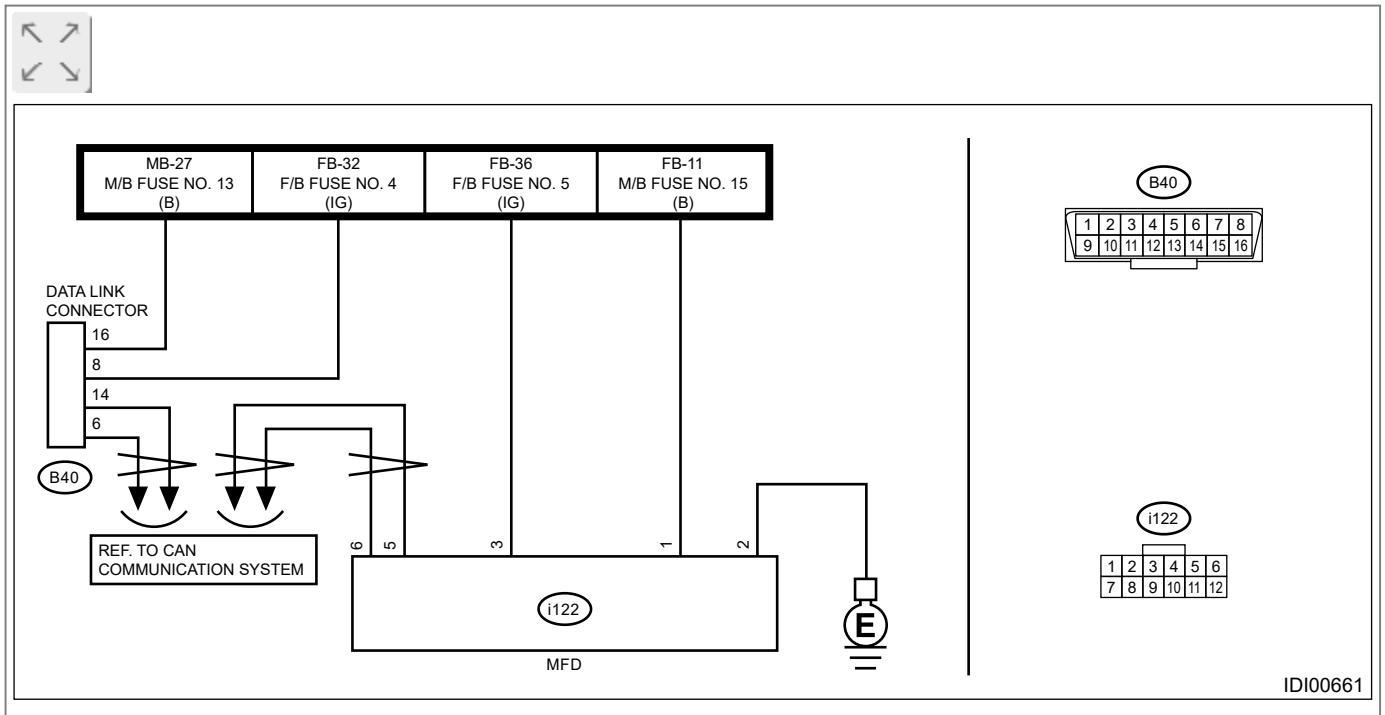
- Defective harness connector
- Power supply circuit malfunction
- Defective MFD
- Defective CAN communication circuit
- Defective Subaru Select Monitor

Trouble symptom:


Communication is impossible between MFD and Subaru Select Monitor.

Wiring diagram:

- Multi-function display (MFD) system  [Ref. to WIRING SYSTEM>Multi-function Display \(MFD\) System>WIRING DIAGRAM.](#)
- CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.](#)




1. CHECK FUSE.

Check the fuse.  [Ref. to INSTRUMENTATION/DRIVER INFO>Relay and Fuse.](#)

Is the check result OK?

Yes

 [Go to 2.](#)

No

Replace the fuse. If the replaced fuse blows out easily, repair the ground short circuit in the harness between the battery and MFD.

2. CHECK HARNESS (OPEN CIRCUIT).



1. Turn the ignition switch to OFF.
2. Disconnect the MFD connector.
3. Turn the ignition switch to ON.
4. Use a tester to measure the voltage between the combination meter connector and chassis ground.

Connector & terminal

(i122) No. 1(+) — Chassis ground (-):

(i122) No. 3(+) — Chassis ground (-):

Is the voltage 10 — 13 V?

Yes

 [Go to 3.](#)

No

Repair the open circuit of the harness between MFD and fuse.

3. CHECK HARNESS (OPEN CIRCUIT).



Using a tester, measure the resistance between MFD connector and chassis ground.

Connector & terminal

(i122) No. 2 — Chassis ground:

Is the resistance less than 1 Ω ?

Yes


 [Go to 4.](#)

No

Repair the open circuit in harness between MFD connector and chassis ground.

4. CHECK LAN SYSTEM.



Inspect LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is the check result OK?

Yes

 [Go to 5.](#)

No

Perform the inspection according to the diagnosis for LAN system.

5. CHECK SUBARU SELECT MONITOR COMMUNICATION.



1. Turn the ignition switch to ON.
2. Check whether communication to MFD can be executed normally.

Is the communication possible with MFD?

Yes

The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

 [Go to 6.](#)


6. CHECK SUBARU SELECT MONITOR.



Communicate with the MFD by connecting the Subaru Select Monitor to another vehicle.

Is the communication possible with MFD?

Yes


Replace the MFD.  [Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display_\(MFD\).](#)

No

Repair or replace the Subaru Select Monitor.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Subaru Select Monitor

OPERATION

- For detailed operation procedures, refer to "Application help".
- When MFD cannot establish communication with Subaru Select Monitor, perform "COMMUNICATION FOR INITIALIZING IMPOSSIBLE".  [Ref. to MULTI-FUNCTION DISPLAY\(DIAGNOSTICS\)>Subaru Select Monitor>INSPECTION.](#)

If the DTCs related to the LAN system are not displayed, perform the inspection by connecting the Subaru Select Monitor to another vehicle which is operating properly and by establishing the communication.

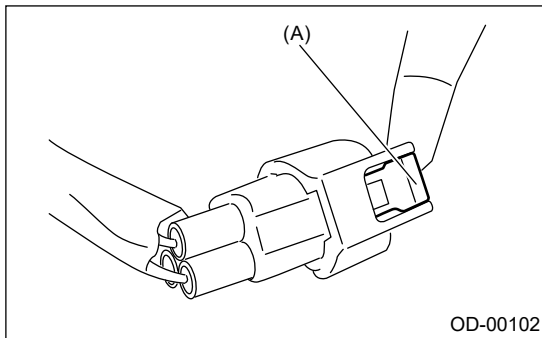
PROCEDURE

1. OCCUPANT DETECTION SYSTEM (BETWEEN AIRBAG REAR HARNESS AND SEAT HARNESS)

- 1. How to disconnect:
Press the lock arm (A) and disconnect the connector.

Caution:

When pulling the slide lock or disconnecting connector, be sure to hold the connector, not the harness.



- 2. How to connect:
Holding the connector, push it in securely until a clicking sound is heard.

Caution:

Be sure to insert the connector in until it is locked. Then pull it gently to make sure that it is locked.

2. AIRBAG CONTROL MODULE

Refer to Airbag System section. [🔗 Ref. to AIRBAG SYSTEM>Airbag_Connector>PROCEDURE > AIRBAG CONTROL MODULE.](#)

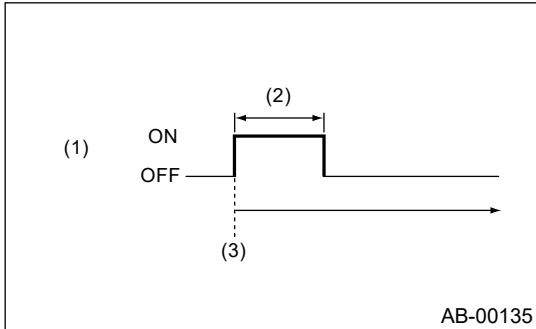
3. BUCKLE SWITCH (PASSENGER'S SEAT)

Refer to Airbag System section. [🔗 Ref. to AIRBAG SYSTEM>Airbag_Connector>PROCEDURE > BUCKLE SWITCH RH.](#)

OCCUPANT DETECTION(DIAGNOSTICS) > Airbag Warning Light Illumination Pattern

INSPECTION

Turn the ignition switch to ON, and confirm that the airbag warning light remains on for approx. 6 seconds and then goes off afterwards.



- (1) Airbag warning light
- (2) Approx. 6 sec.
- (3) Ignition switch ON

PROCEDURE

1. CHECK WARNING LIGHT.



Check whether the airbag warning light in the combination meter is lit.

Does the airbag warning light illuminate?

Yes

[Go to 2.](#)

No

Perform the diagnosis according to phenomenon of the problem.

2. READ DTC.



1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Read the DTC. [Ref. to OCCUPANT DETECTION\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Note:

If the communication function of the Subaru Select Monitor cannot be executed properly, check the communication circuit. [Ref. to OCCUPANT DETECTION\(DIAGNOSTICS\)>Subaru Select Monitor>INSPECTION.](#)

5. Record all DTCs and freeze frame data.

Are any DTCs displayed?

Yes

[Go to 3.](#)

No



Go to "Airbag Warning Light Failure". [Ref. to AIRBAG\(DIAGNOSTICS\)>Airbag Warning Light Failure.](#)

3. PERFORM DIAGNOSIS.



1. Determine the possible cause from "List of Diagnostic Trouble Code (DTC)". [Ref. to AIRBAG\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)
2. Repair the trouble cause.
3. Perform the clear memory operation. [Ref. to AIRBAG\(DIAGNOSTICS\)>Clear](#)

[memory.](#)

- 4.** Perform the Inspection Mode.  [Ref. to OCCUPANT DETECTION\(DIAGNOSTICS\)>Inspection Mode.](#)
- 5.** Read any other DTCs displayed.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes

Perform the procedure 1) to 5) in step 3.

No

Finish the diagnosis.

OCCUPANT DETECTION(DIAGNOSTICS) > Check List for Interview

CHECK

1. CONDITIONS OF MALFUNCTION



Customer's Name		Inspector's Name	
Date Vehicle Brought in	/ /	Registration No.	
Odometer reading	km miles	V.I.N.	
Date Problem Occurred	/ /	Registration Year	/ /
Occupant detection sensor mat serial No.		Occupant detection control module serial No.	
Weather	<input type="checkbox"/> Fine <input type="checkbox"/> Cloudy <input type="checkbox"/> Rainy <input type="checkbox"/> Snowy <input type="checkbox"/> Other:		
Location where problem occurred			
Temperature	°C (°F)		
Humidity	% RH		
A/C operation	<input type="checkbox"/> OFF <input type="checkbox"/> ON (°C)		
Road Condition	<input type="checkbox"/> Flat road <input type="checkbox"/> Uphill <input type="checkbox"/> Downhill <input type="checkbox"/> Gravel road <input type="checkbox"/> Stone pavement <input type="checkbox"/> Other:		
Vehicle Operation	<input type="checkbox"/> STARTING CONDITION <input type="checkbox"/> Idling <input type="checkbox"/> Driving <input type="checkbox"/> Constant speed <input type="checkbox"/> Accelerating <input type="checkbox"/> Decelerating <input type="checkbox"/> Turning <input type="checkbox"/> Other:		
Time the seat is occupied	<input type="checkbox"/> Time length from when you started driving to when the warning light illuminated:		
Details of Problem			
Status of airbag warning light at dealer inspection	<input type="checkbox"/> Remains ON <input type="checkbox"/> Remains OFF		

<p>Refer to "Indicator light illumination pattern".  Ref. to OCCUPANT DETECTION(DIAGNOSTIC CS)>Check List for Interview>CHECK > INDICATOR LIGHT ILLUMINATION PATTERN.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Illuminated, but goes off after the ignition switch is turned to OFF and then to ON
<p>Status of airbag warning light at malfunction occurrence Refer to "Indicator light illumination pattern".  Ref. to OCCUPANT DETECTION(DIAGNOSTIC CS)>Check List for Interview>CHECK > INDICATOR LIGHT ILLUMINATION PATTERN.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Remains ON <input type="checkbox"/> Remains OFF <input type="checkbox"/> Illuminated, but goes off after the ignition switch is turned to OFF and then to ON
<p>Status of passenger's airbag ON/OFF indicator light at dealer inspection Refer to "Indicator light illumination pattern".  Ref. to OCCUPANT DETECTION(DIAGNOSTIC CS)>Check List for Interview>CHECK > INDICATOR LIGHT ILLUMINATION PATTERN.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> ON light illuminates <input type="checkbox"/> Airbag ON indicator illuminates when CRS is installed or when the seat is not occupied. <input type="checkbox"/> OFF light illuminates <input type="checkbox"/> Airbag OFF indicator illuminates when an adult occupies the seat. <input type="checkbox"/> Both remain ON <input type="checkbox"/> Both remain OFF
<p>Status of passenger's airbag ON/OFF indicator at malfunction occurrence Refer to "Indicator light illumination pattern".  Ref. to OCCUPANT DETECTION(DIAGNOSTIC CS)>Check List for Interview>CHECK > INDICATOR LIGHT ILLUMINATION PATTERN.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> ON light illuminates <input type="checkbox"/> Airbag ON indicator illuminates when CRS is installed or when the seat is not occupied. <input type="checkbox"/> OFF light illuminates <input type="checkbox"/> Airbag OFF indicator illuminates when an adult occupies the seat. <input type="checkbox"/> Both remain ON <input type="checkbox"/> Both remain OFF
<p>DTC output</p>	<ul style="list-style-type: none"> <input type="checkbox"/> OK code

	<input type="checkbox"/> Airbag CM current malfunction code: (Code:) <input type="checkbox"/> Airbag CM past malfunction code: (Code:) <input type="checkbox"/> Occupant detection CM current malfunction code: (Code:) <input type="checkbox"/> Occupant detection CM past malfunction code: (Code:)
Seat specification (With/without seat heater)	<input type="checkbox"/> Without seat heater <input type="checkbox"/> With seat heater <input type="checkbox"/> Seat heater was ON when fault was detected. <input type="checkbox"/> Seat heater was OFF when fault was detected. <input type="checkbox"/> Heater circuit is open.
Seat occupant status at malfunction occurrence	<input type="checkbox"/> With passenger Refer to "No. 1 in STATUS OF PASSENGER'S SEAT". 📄 Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Check List for Interview>CHECK > STATUS OF PASSENGER'S SEAT. <input type="checkbox"/> With CRS installation Refer to "No. 2 in STATUS OF PASSENGER'S SEAT". 📄 Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Check List for Interview>CHECK > STATUS OF PASSENGER'S SEAT. <input type="checkbox"/> Without passenger • CRS installation Refer to "No. 3 in STATUS OF PASSENGER'S SEAT". 📄 Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Check List for Interview>CHECK > STATUS OF PASSENGER'S SEAT.

2. STATUS OF PASSENGER'S SEAT



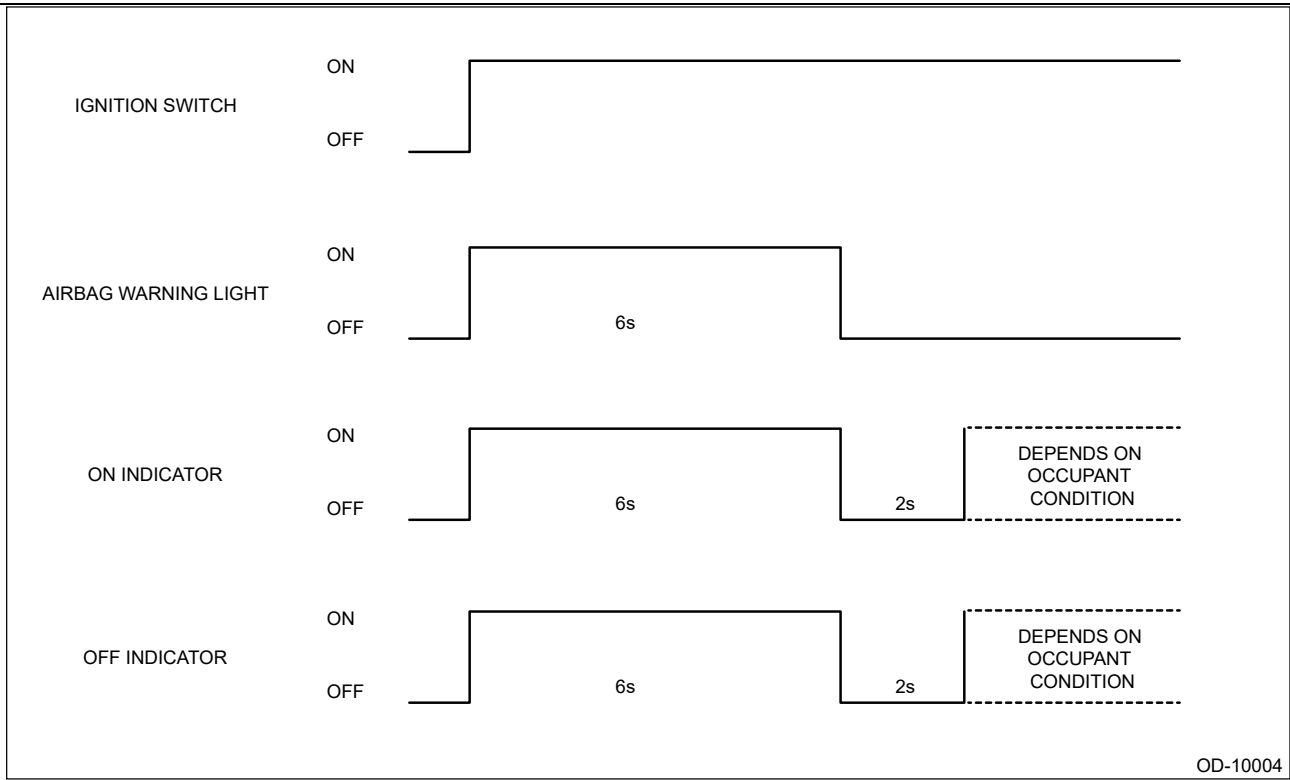
N o. 1	When the passenger's seat was occupied	<input type="checkbox"/> Height: <input type="checkbox"/> Weight: <input type="checkbox"/> With ski wear, coat, or other thick lower garments such as snowsuit worn <input type="checkbox"/> Without ski wear, coat, or other thick lower garments such as snowsuit worn <input type="checkbox"/> Seat belt fastened <input type="checkbox"/> Seat belt not fastened <input type="checkbox"/> Seat slide position (position from the full forward position) <input type="checkbox"/> Seat backrest reclining angle (position from the fully upright position) <input type="checkbox"/> Posture (normally seated, reached for items on the rear seat, moved the seat slide, lied down on the fully flattened seat, legs placed on the instrument panel, or other:) <input type="checkbox"/> Seat got wet due to rain, spill of drink, etc. <input type="checkbox"/> Seat accessory (refer to No. 4 below) attached between the passenger and seat <input type="checkbox"/> Items placed between the passenger and floor carpet (shoe placement item, other:) <input type="checkbox"/> Metal parts inside the vehicle contacted upon fault detection (towel bar, seat frame, vehicle body, cigarette socket, other:)
--------------	--	---

		<input type="checkbox"/> Electronic components (refer to No. 5 below) used ●●● When yes, go to No. 5. <input type="checkbox"/> Electronic components not used <input type="checkbox"/> With an item installed under the passenger's seat: Installed item ()
N o. 2	When the CRS was installed on the passenger's seat	<input type="checkbox"/> A child occupied the seat ●●● When yes, go to No. 1. <input type="checkbox"/> No child occupied the seat <input type="checkbox"/> Seat belt fastened (Appropriately? Yes • No) <input type="checkbox"/> Seat belt not fastened <input type="checkbox"/> Type of the CRS (infant car seat, rear facing installation, forward facing installation, booster seat, other) <input type="checkbox"/> CRS manufacturer, model <input type="checkbox"/> Seat got wet due to rain, spill of drink, etc. <input type="checkbox"/> Seat accessory (refer to No. 4 below) attached between the passenger and seat <input type="checkbox"/> Electronic components (refer to No. 6 below) installed ●●● When yes, go to No. 6. <input type="checkbox"/> Without any installation item other than the CRS <input type="checkbox"/> With an item installed under the passenger's seat: Installed item ()
N o. 3	Without a passenger on the passenger's seat, and without CRS installation	<input type="checkbox"/> Seat got wet due to rain, spill of drink, etc. <input type="checkbox"/> Seat accessory (refer to No. 4 below) attached ●●● When yes, go to No. 4. <input type="checkbox"/> With other goods (bag, luggage, beverage bottle, other:) <input type="checkbox"/> Electronic components (refer to No. 6 below) installed ●●● When yes, go to No. 6. <input type="checkbox"/> Without any goods <input type="checkbox"/> With an item installed under the passenger's seat: Installed item ()
N o. 4	When accessories are installed on the passenger's seat	<input type="checkbox"/> With seat accessory installed (retrofitted seat heater, seat cooler, cushion mat, seat cover, other:)
N o. 5	When the passenger on the passenger's seat was using electronic components.	<input type="checkbox"/> Electronic components (personal computer, tablet device, mobile phone, smartphone, portable music player, portable game device, portable radio, portable navigation, other:) used <input type="checkbox"/> Above-listed device used while being connected to power supply inside the vehicle such as a cigarette lighter socket <input type="checkbox"/> Above-listed device used without being connected to power supply inside the vehicle such as a cigarette lighter socket <input type="checkbox"/> Above-listed device used while being connected to other power supply
N o. 6	When the electronic components were placed on the passenger's seat (no occupant on the seat)	<input type="checkbox"/> Electronic components (personal computer, tablet device, mobile phone, smartphone, portable music player, portable game device, portable radio, portable navigation, other:) equipped <input type="checkbox"/> Above-listed device connected to power supply inside the vehicle such as a cigarette lighter socket <input type="checkbox"/> Above-listed device not connected to power supply inside the vehicle such as a cigarette lighter socket <input type="checkbox"/> Above-listed device connected to other power supply

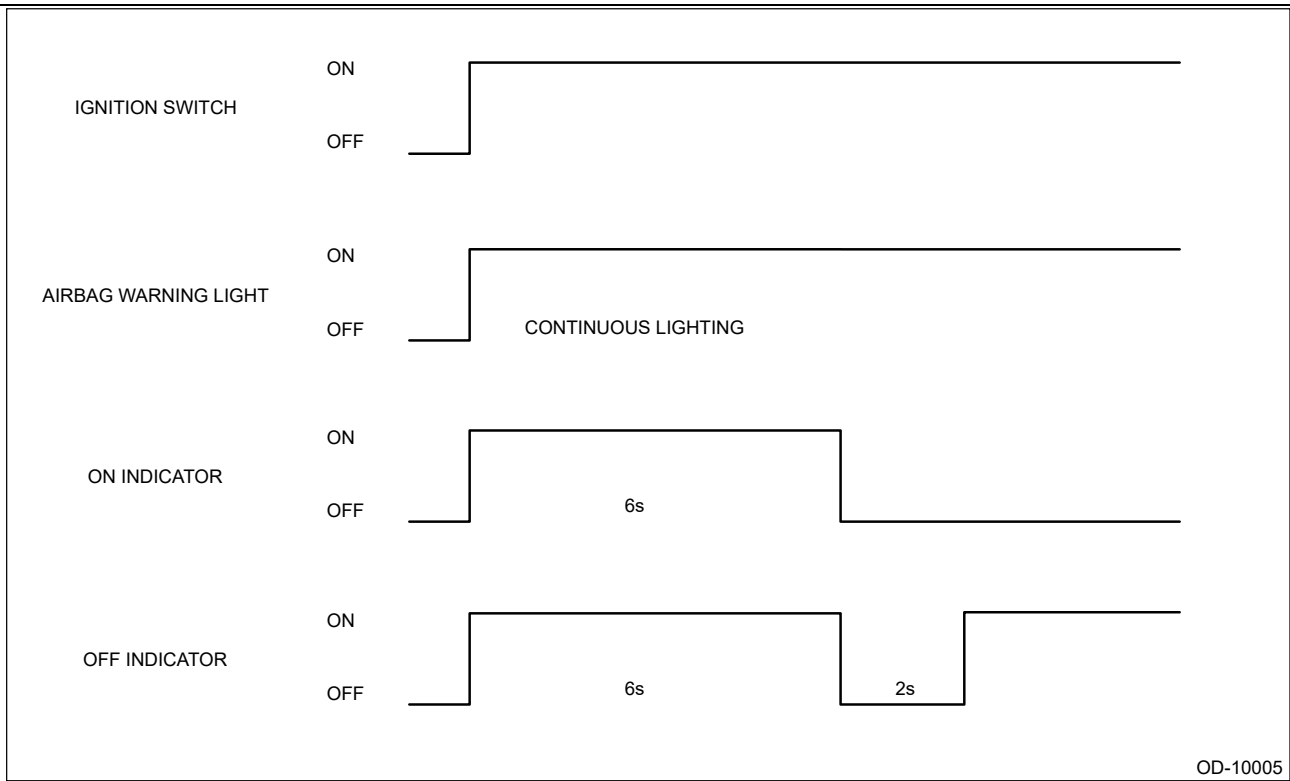
3. INDICATOR LIGHT ILLUMINATION PATTERN



When all the systems are normal.

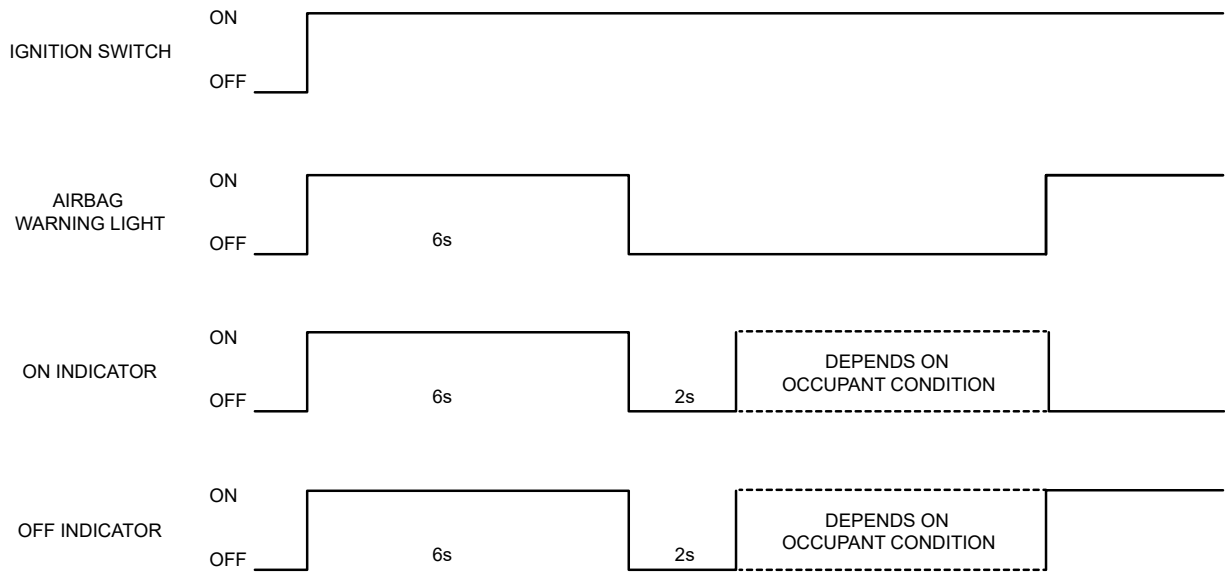


When there has been a failure on the occupant detection control module since the ignition switch was turned ON.



Arbitrary length of time has elapsed after the ignition switch was turned ON → A failure occurred

on the occupant detection control module.



OD-10006

OCCUPANT DETECTION(DIAGNOSTICS) > Clear memory

OPERATION

After repairing the occupant detection system, clear the DTCs stored in the airbag control module and the occupant detection control module.

1. AIRBAG SYSTEM

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Airbag], and then select [Enter].
5. On [Airbag] display, select [DTC].
6. On [DTC] display, select [Clear memory].

Note:

For detailed operation procedures, refer to "Application help".

2. OCCUPANT DETECTION SYSTEM

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Occupant Detection], and then select [Enter].
5. On [Occupant Detection] display, select [DTC].
6. On [DTC] display, select [Clear memory].

Note:

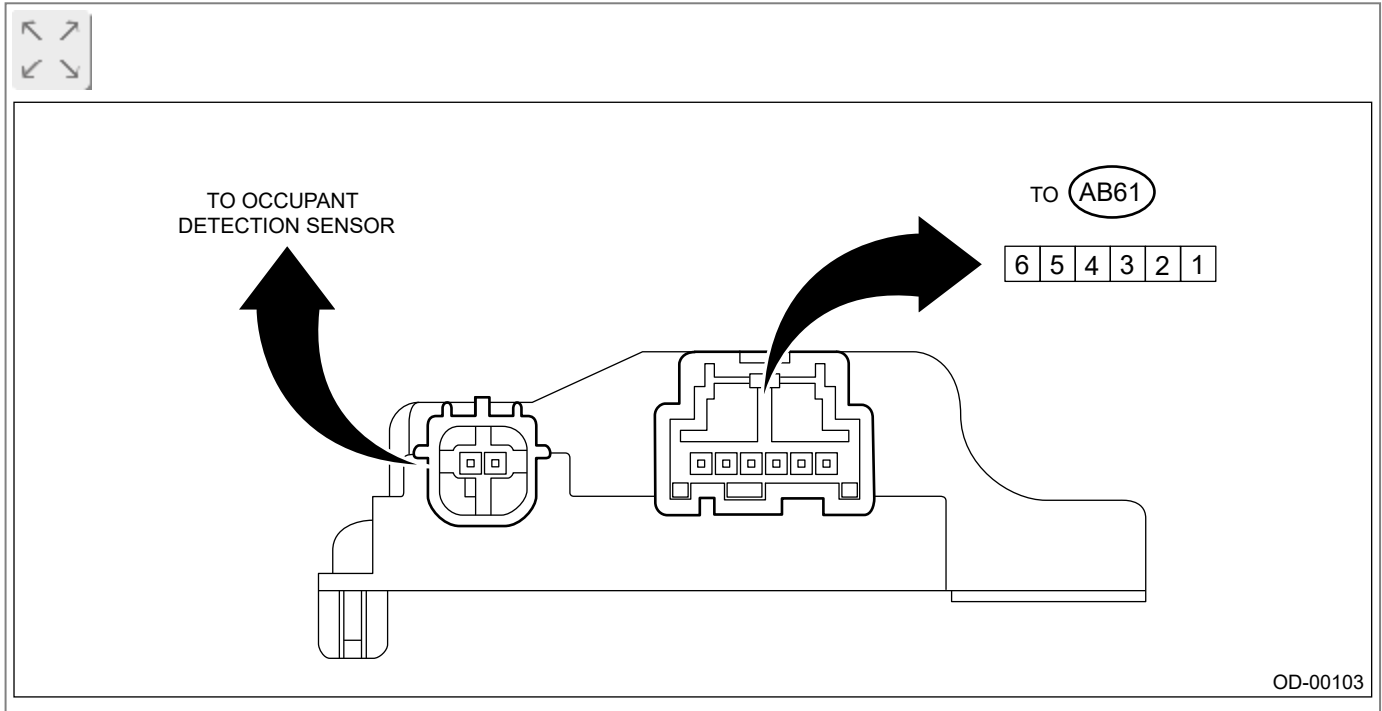
For detailed operation procedures, refer to "Application help".

OCCUPANT DETECTION(DIAGNOSTICS) > Control Module I/O Signal

ELECTRICAL SPECIFICATION

Caution:

Never remove the occupant detection control module, occupant detection sensor or seat frame because they are integrated into one unit.



OD-00103


Terminal No.	Terminal name	Input/Output value	Note
1	Buckle switch (+)	0 – IG voltage	When buckle switch is ON
2	Buckle switch (-)	0 V	Switch ground
3	Not used	—	—
4	Airbag CM communication (-)	—	—
5	Airbag CM communication (+)	—	—
6	IG power supply	8 – 16 V	When IG switch is ON

Note:

Occupant detection sensor signal is unmeasurable.

OCCUPANT DETECTION(DIAGNOSTICS) > Control Module I/O Signal

WIRING DIAGRAM

Refer to "Occupant Detection System" in the wiring diagram.  [Ref. to WIRING SYSTEM>Occupant Detection System>WIRING DIAGRAM.](#)

OCCUPANT DETECTION(DIAGNOSTICS) > Data Monitor

LIST

Item	Display	Note
Front Passenger Seat Status	Empty or Child / Adult or Child	<p>“Adult or Child” when the occupant is present “Empty or Child” when the seat is unoccupied or when child restraint seat is installed</p> <p>Caution: When checking the operating status, be careful of the followings.</p> <ul style="list-style-type: none">• When the seat is unoccupied: Do not place anything on the seat.• Child restraint seat: Install the seat according to its instruction manual.• When the seat is occupied: Someone who weighs at least approx. 70 kg (155 lb) must be seated during the check.

OCCUPANT DETECTION(DIAGNOSTICS) > Data Monitor

OPERATION

Note:

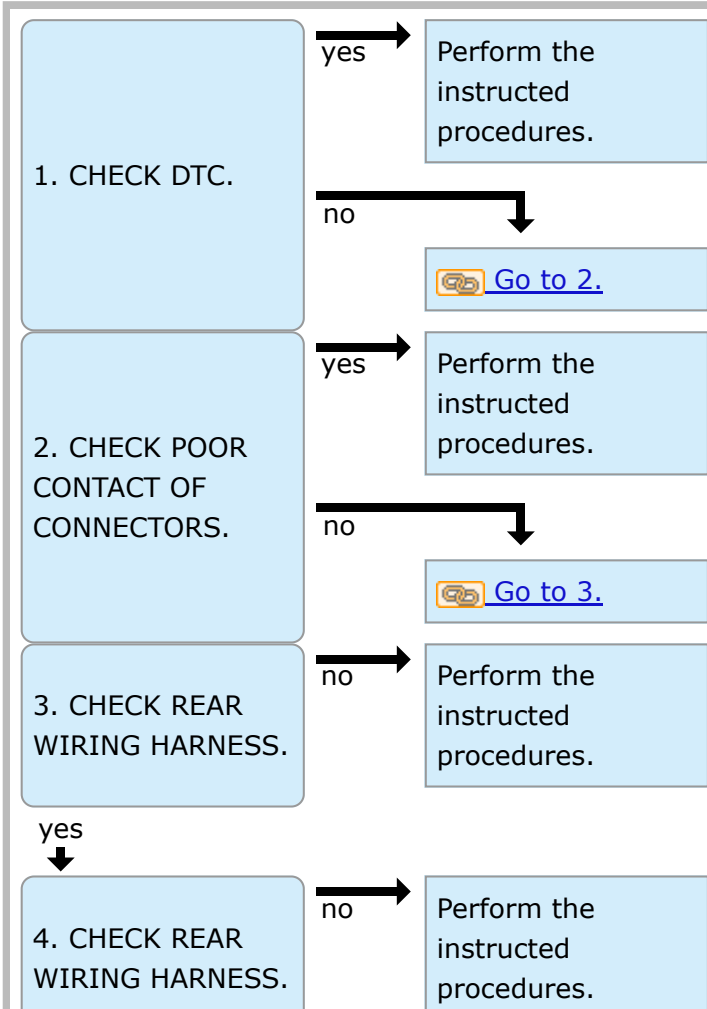
For detailed operation procedures, refer to "Application help".

- 1.** On [Start] display, select [Diagnosis].
- 2.** On [Vehicle selection] display, input the target vehicle information and select [OK].
- 3.** On [Main Menu] display, select [Each System].
- 4.** On [Select System] display, select [Occupant Detection].
- 5.** On [Occupant Detection] display, select [Data monitor].

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1650 OCCUPANT DETECTION SYSTEM MALFUNCTION

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Occupant detection system [Ref. to WIRI SYSTEM>Occupant Detection System>WIRI](#)

Click the image to see the enlarged image

Caution:
Before performing diagnosis, refer "CAUTION" in "General Description AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

START

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1655 FRONT BUCKLE SWITCH RH FAILURE


Diagnosis start condition:

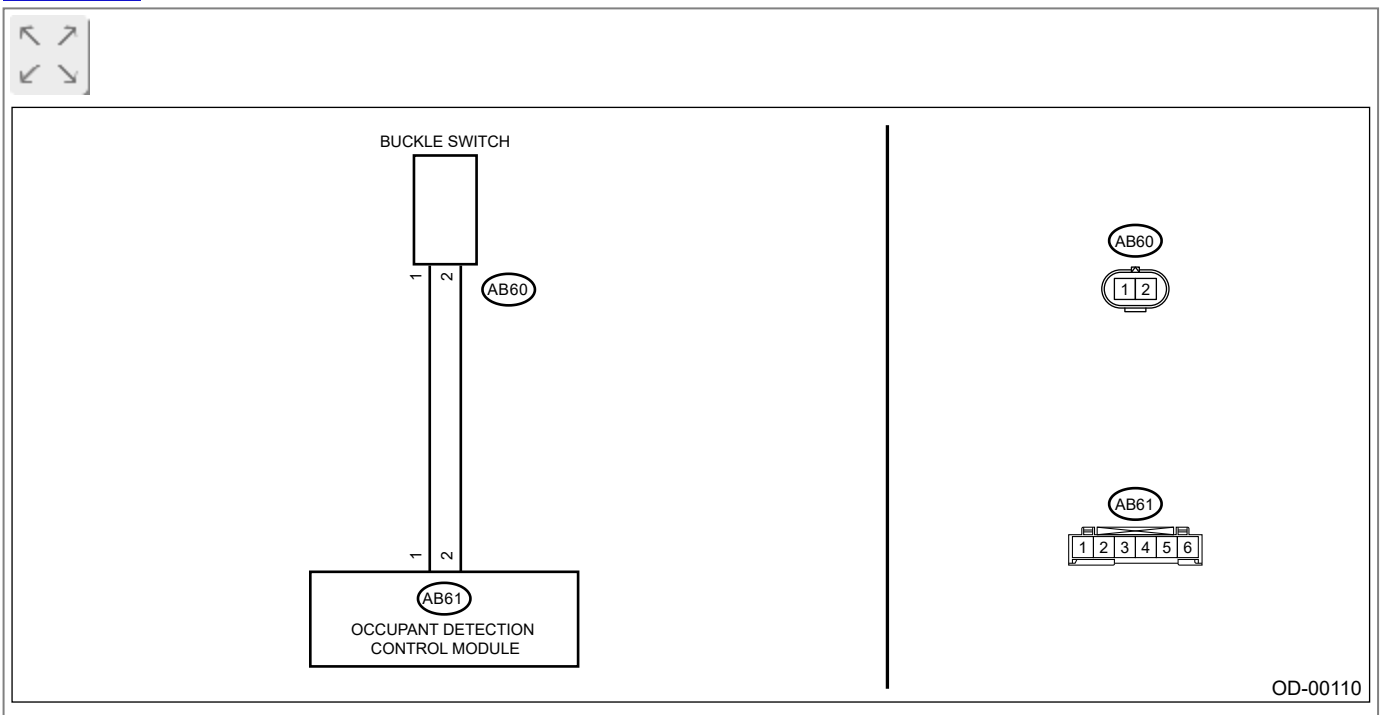
When the ignition voltage is 8 V — 16 V

DTC detecting condition:


- Passenger’s buckle switch circuit is open, shorted or shorted to ground.
- Seat harness circuit is open, shorted or shorted to ground.
- Occupant detection control module is faulty.

Wiring diagram:

Occupant detection system  [Ref. to WIRING SYSTEM>Occupant Detection System>WIRING DIAGRAM.](#)






1. CHECK DTC.

Read the DTC of the occupant detection system.  [Ref. to OCCUPANT DETECTION\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B1760, B1771 or B1795 displayed?

Yes

Perform the diagnosis for the displayed DTC B1760, B1771, or B1795.  [Ref. to OCCUPANT DETECTION\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1760 OCCUPANT DETECTION SENSOR MAT.](#)  [Ref. to OCCUPANT DETECTION\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1771 BUCKLE SWITCH.](#)  [Ref. to OCCUPANT DETECTION\(DIAGNOSTICS\)>Diagnostic Procedure](#)

[with Diagnostic Trouble Code \(DTC\)>DTC B1795 OCCUPANT DETECTION MODULE INTERNAL CIRCUIT.](#)

No

 [Go to 2.](#)

2. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the occupant detection control module and buckle switch.

Is there poor contact?

Yes

When the connector is not fully connected, reconnect the connector correctly. Replace the airbag harness if the connector is faulty.

No


 [Go to 3.](#)

3. CHECK BUCKLE SWITCH.


1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait for 60 seconds.
2. Disconnect the buckle switch connector (AB60).
3. Connect the test harness AE and test harness connector Y to buckle switch connector (AB60).
4. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for 6 seconds and go off?

Yes

Replace the buckle switch.  [Ref. to SEAT BELT SYSTEM>Front Seat Belt>REMOVAL > SEAT BELT INNER - FRONT.](#)

No

Check the seat harness, and if any fault is found, replace the seat harness. If the fault is not fixed, replace the occupant detection system (passenger's side cushion & frame assembly).  [Ref. to SEATS>Front Seat>DISASSEMBLY > PASSENGER'S SEAT.](#)

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1760 OCCUPANT DETECTION SENSOR MAT

Diagnosis start condition:

When the ignition voltage is 8 V — 16 V

DTC detecting condition:

- Occupant detection sensor is faulty.
- Occupant detection sensor circuit is open, shorted between terminals, shorted to power supply or shorted to ground.
- Seat heater circuit is open.
- Occupant detection control module is faulty.

1. CHECK AIRBAG WARNING LIGHT.


Check whether or not the airbag warning light illuminate.

Does it Illuminate?

Yes

 [Go to 2.](#)

No

Read the DTC, and if DTC 1760 is recorded as a past malfunction,  [Go to 3.](#)

2. CHECK STATUS OF PASSENGER'S SEAT.

Check if the passenger's seat cushion is wet.

Is it wet?

Yes

 [Go to 3.](#)

No

 [Go to 4.](#)

3. DRY PASSENGER'S SEAT.


Dry the passenger's seat well naturally.

Is it dry?


Yes

 [Go to 4.](#)

No


After drying well,  [Go to 4.](#)

4. CHECK DTC.


Read the DTC of the occupant detection system.  [Ref. to OCCUPANT DETECTION\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\)>OPERATION > OCCUPANT DETECTION SYSTEM.](#)

Is DTC B1760 (current malfunction) displayed again?

Yes

When DTC B1760 is displayed,  [Go to 5.](#)

No


Clear the memory.  [Ref. to OCCUPANT DETECTION\(DIAGNOSTICS\)>Clear memory>OPERATION > OCCUPANT DETECTION SYSTEM.](#)

5. CHECK POOR CONTACT OF CONNECTORS.


Check for poor contact of connectors between the occupant detection control module and the occupant detection sensor.

Is there poor contact of connector?

Yes

When the connector is not fully connected, reconnect the connector correctly. Replace the faulty harness if the connector is faulty. (Replace the occupant detection harness or replace the occupant detection system (passenger's & frame assembly)).  [Ref. to SEATS>Front Seat>DISASSEMBLY > PASSENGER'S SEAT.](#)

No

Replace the occupant detection system (passenger's & frame assembly).  [Ref. to SEATS>Front Seat>DISASSEMBLY > PASSENGER'S SEAT.](#)

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC B1771 BUCKLE SWITCH

Diagnosis start condition:

When the ignition voltage is 8 V — 16 V

DTC detecting condition:

- Passenger's seat buckle switch is faulty.
- Passenger's buckle switch circuit is open, shorted or shorted to ground.
- Occupant detection system is faulty.
- Occupant detection harness is faulty.

Perform the diagnosis from step 2 in "DTC B1655 FRONT BUCKLE SWITCH RH FAILURE".  [Ref. to OCCUPANT DETECTION\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1655 FRONT BUCKLE SWITCH RH FAILURE.](#)

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC B1795 OCCUPANT DETECTION MODULE INTERNAL CIRCUIT

Diagnosis start condition:

When the ignition voltage is 8 V — 16 V

DTC detecting condition:

Occupant detection control module is faulty.

When "DTC B1795 OCCUPANT DETECTION MODULE INTERNAL CIRCUIT" is detected, the occupant detection control module is faulty. Replace the occupant detection system (passenger's side cushion & frame assembly).  [Ref. to SEATS>Front Seat>DISASSEMBLY > PASSENGER'S SEAT.](#)

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)


OPERATION

Read out DTCs stored in the airbag control module and the occupant detection control module.

1. AIRBAG SYSTEM

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Airbag], and then select [Enter].
5. On [Airbag] display, select [DTC].


Note:

- For detailed operation procedures, refer to "Application help".
- For details concerning DTC, refer to "List of Diagnostic Trouble Code (DTC) in AIRBAG SYSTEM.  [Ref. to AIRBAG\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

2. OCCUPANT DETECTION SYSTEM

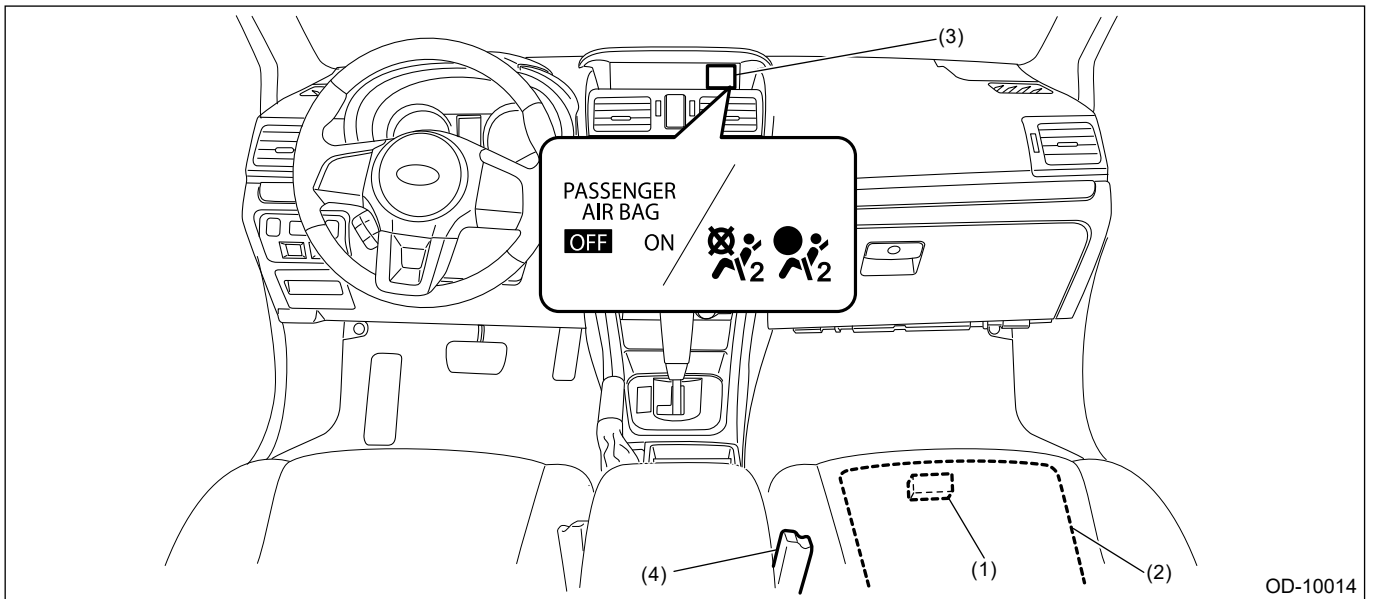
1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Occupant Detection], and then select [Enter].
5. On [Occupant Detection] display, select [DTC].

Note:

- For detailed operation procedures, refer to "Application help".
- For details concerning DTC, refer to "List of Diagnostic Trouble Code (DTC)".
 [Ref. to OCCUPANT DETECTION\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

OCCUPANT DETECTION(DIAGNOSTICS) > Electrical Component Location

LOCATION



(1) Occupant detection control module

(3) Airbag ON/OFF indicator light

(4) Buckle switch (passenger's seat)


(2) Occupant detection sensor

OCCUPANT DETECTION(DIAGNOSTICS) > General Description

CAUTION



1. The occupant detection system (passenger seat only) control module and the occupant detection sensor are fixed to the seat cushion frame. Never remove the occupant detection control module or the occupant detection sensor from the seat cushion frame.
2. Do not replace the seat cushion pad and seat cushion cover alone. Always replace seat cushion & frame assembly as a set. The seat cushion pad, cushion frame, and seat cushion cover are adjusted as a set at the time of manufacture. If cushion pads and cushion frames are combined from those of other vehicles or other sets, the occupant detection system may not operate properly.
3. Never connect the battery in reverse polarity. Occupant detection system may be destroyed instantly.
4. Do not disconnect the battery cables while the engine is running. A large counter electromotive force will be generated in the generator, and this voltage may damage electronic parts such as occupant detection control module.
5. Before disconnecting the connectors of each sensor and control module, be sure to turn the ignition switch to OFF and wait for 60 seconds or more. Occupant detection control module may be damaged.
6. Every occupant detection system-related part is a precision part. Do not drop them.

Caution:

- **Do not use electrical test equipment on wiring harness and connector circuits of the airbag system.**
- **Be careful not to damage the airbag system wiring harness when servicing the occupant detection system.**
- **Refer to CAUTION in Airbag System when repairing the occupant detection system.**  [Ref. to AIRBAG SYSTEM>General Description>CAUTION.](#)

OCCUPANT DETECTION(DIAGNOSTICS) > General Description

INSPECTION

Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)  [Ref. to STARTING/CHARGING SYSTEMS\(H4DOTC\)>General Description.](#)


OCCUPANT DETECTION(DIAGNOSTICS) > General Description

PREPARATION TOOL

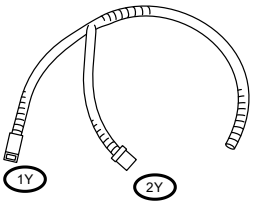
Caution:

To measure the voltage and resistance of airbag system and occupant detection system components, be sure to use the specified test harness.

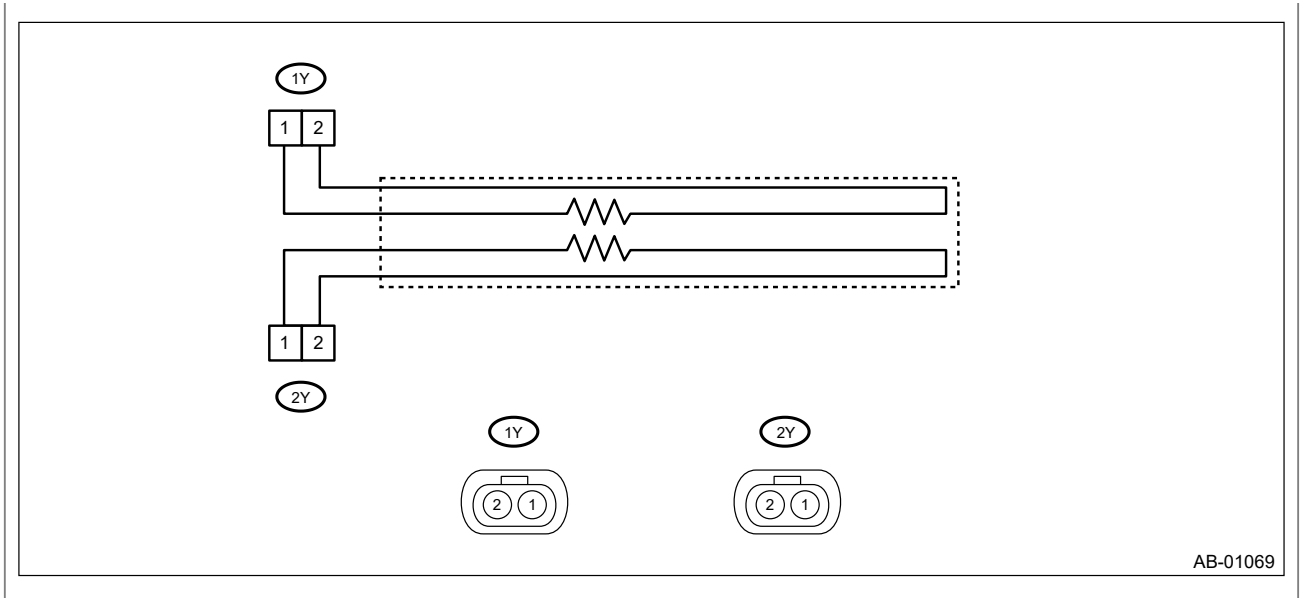
1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>STSSM4</p>	<p>— (Newly adopted tool)</p>	<p>SUBARU SELECT MONITOR 4</p>	<p>Used for setting of each function and troubleshooting for electrical system.</p> <p>Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".</p>

- TEST HARNESS Y

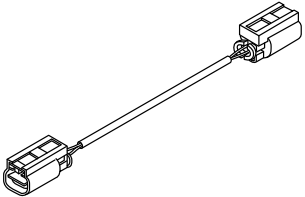
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST98299AG040</p>	<p>98299AG040</p>	<p>TEST HARNESS Y</p>	<p>Used for troubleshooting seat belt buckle switch.</p>

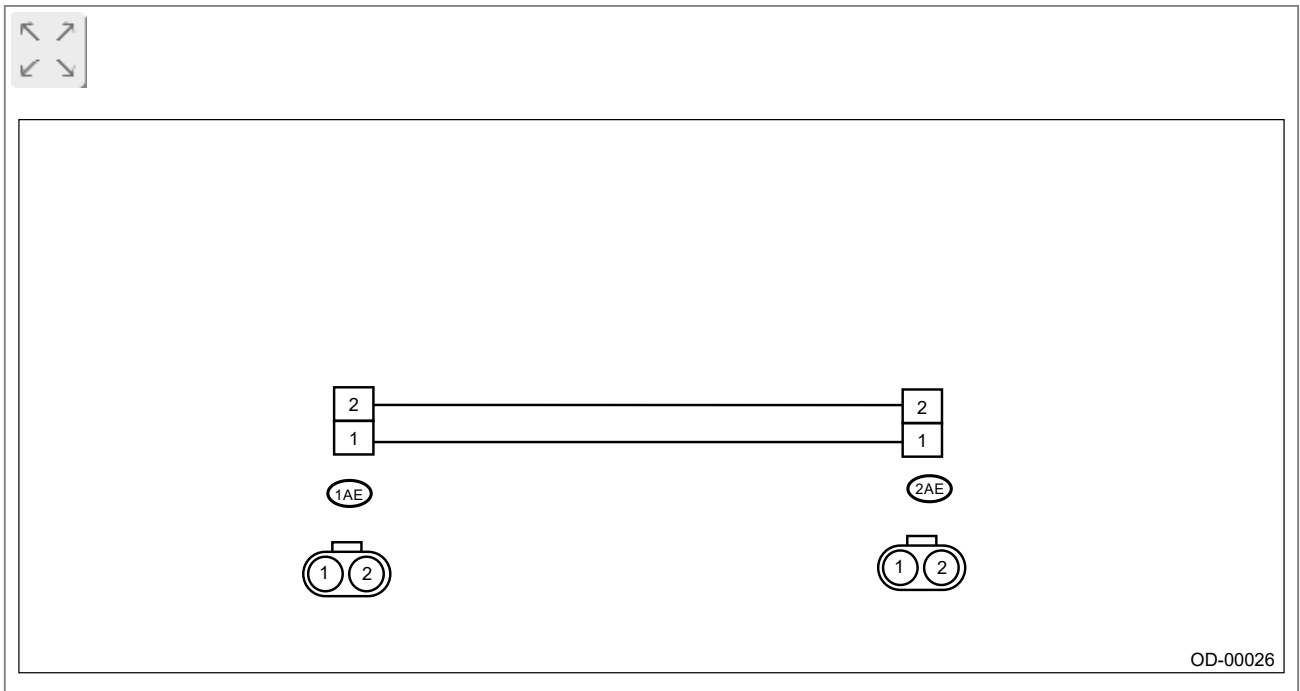




AB-01069

• TEST HARNESS AE

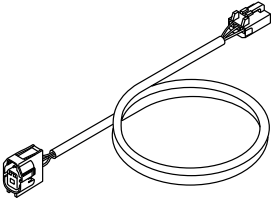
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST98299XA030</p>	98299XA030	TEST HARNESS AE	TEST HARNESS Y adapter harness. Used for troubleshooting seat belt buckle switch.

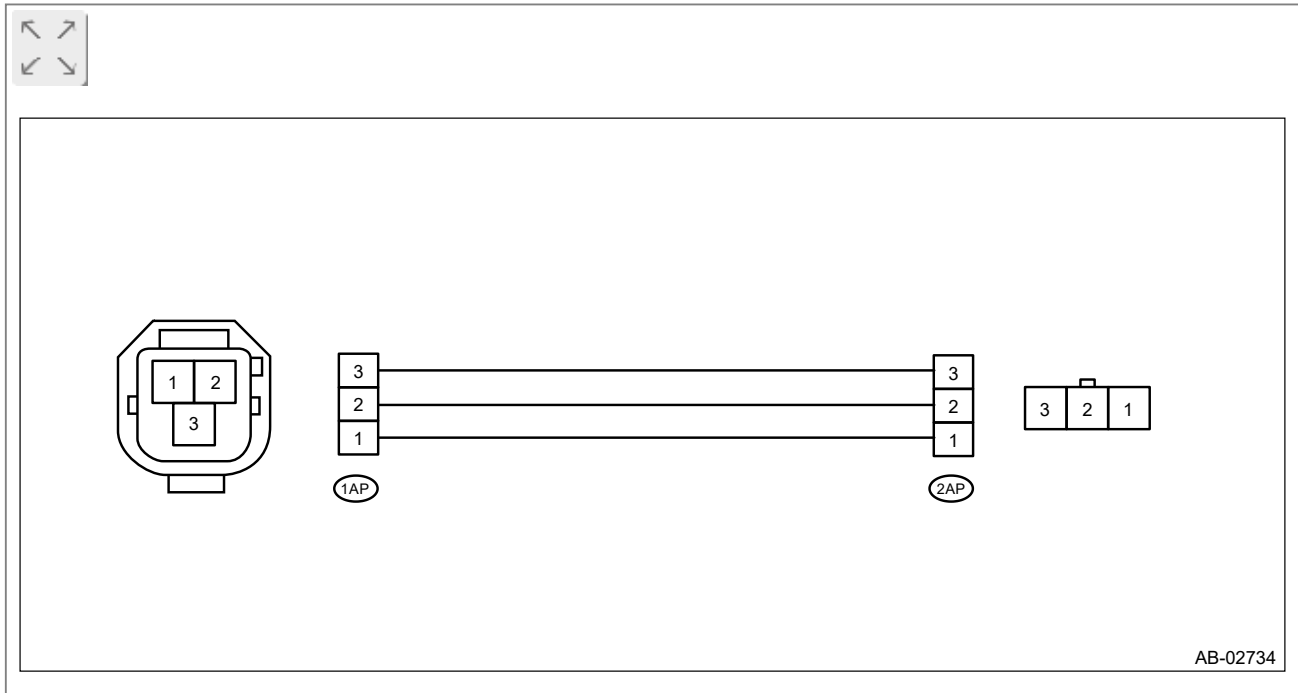


OD-00026

• TEST HARNESS AP

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ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST98299FJ030</p>	98299FJ030	TEST HARNESS AP	Used when measuring voltage and resistance of occupant detection system.



2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.





OCCUPANT DETECTION(DIAGNOSTICS) > Inspection Mode


PROCEDURE

Recreate the circumstance by referring to the conditions described in the checklist.

OCCUPANT DETECTION(DIAGNOSTICS) > List of Diagnostic Trouble Code (DTC)

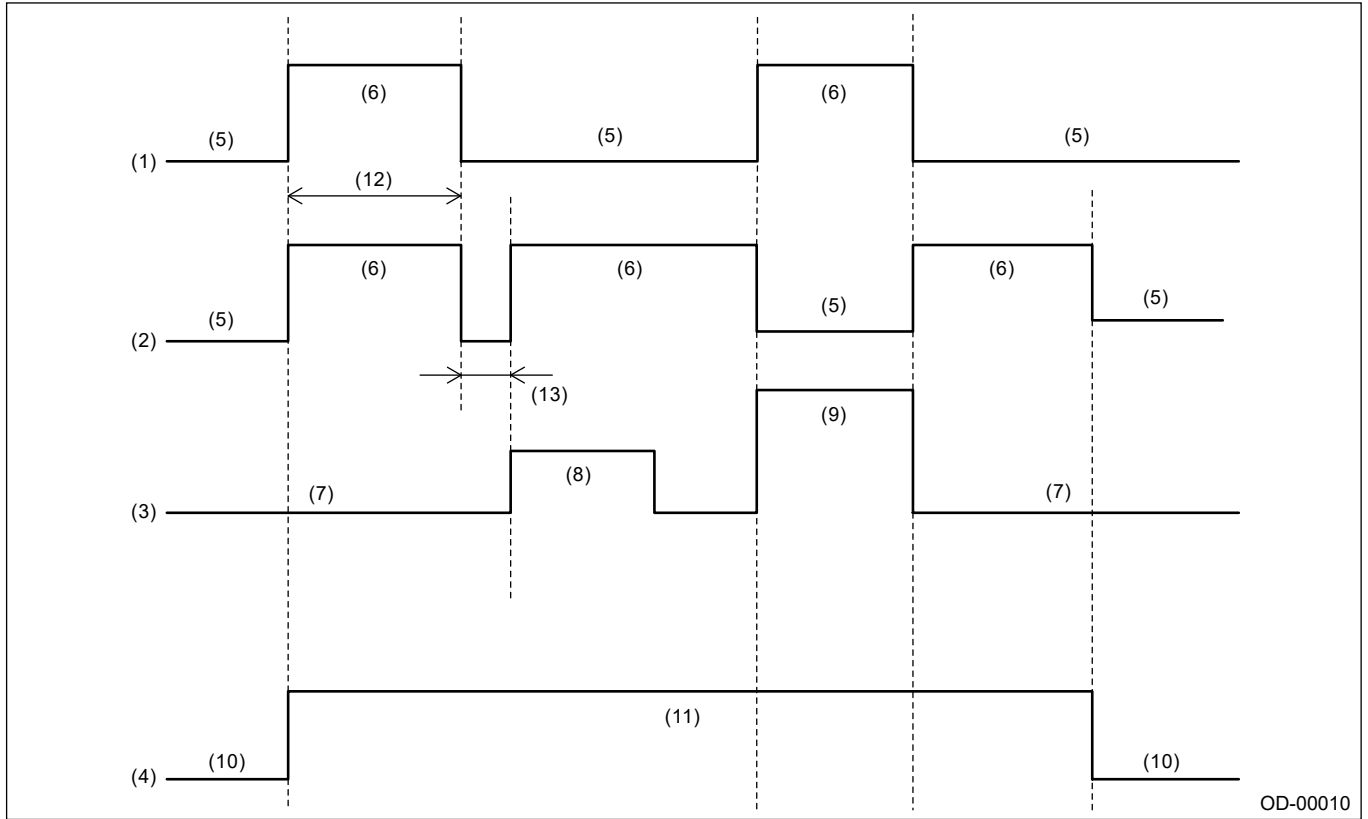
LIST

DTC	Item	Content of diagnosis	Reference
B1650	OCCUPANT DETECTION SYSTEM MALFUNCTION	<ul style="list-style-type: none"> • Occupant detection sensor is faulty. • Occupant detection control module is faulty. • Occupant detection harness is faulty. • Fuse No. 25 is blown out. • Rear airbag harness is faulty. 	 Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1650 OCCUPANT DETECTION SYSTEM MALFUNCTION.
B1655	FRONT BUCKLE SWITCH RH FAILURE	<ul style="list-style-type: none"> • Passenger’s buckle switch circuit is open, shorted or shorted to ground. • Occupant detection system is faulty. • Occupant detection harness is faulty. 	 Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1655 FRONT BUCKLE SWITCH RH FAILURE.
B1760	OCCUPANT DETECTION SENSOR MAT	<ul style="list-style-type: none"> • Occupant detection sensor is faulty. • Occupant detection sensor circuit is open, shorted between terminals, shorted to power supply or shorted to ground. • Seat heater circuit is open. • Occupant detection control module is faulty. 	 Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1760 OCCUPANT DETECTION SENSOR MAT.
B1771	BUCKLE SWITCH	<ul style="list-style-type: none"> • Passenger’s seat buckle switch is faulty. • Passenger’s buckle switch circuit is open, shorted or shorted to ground. • Occupant detection system is faulty. • Occupant detection harness is faulty. 	 Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1771 BUCKLE SWITCH.

B1795	OCCUPANT DETECTION MODULE INTERNAL CIRCUIT	Occupant detection control module is faulty.	 Ref. to OCCUPANT DETECTION(DIAGN OSTICS)>Diagnosti c Procedure with Diagnostic Trouble Code (DTC)>DTC B1795 OCCUPANT DETECTION MODULE INTERNAL CIRCUIT.
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OCCUPANT DETECTION(DIAGNOSTICS) > Passenger's Airbag ON/OFF Indicator Light Illumination Pattern

INSPECTION



OD-00010

- | | | |
|--|-------------------------|------------------------|
| (1) Passenger's airbag ON indicator light | (6) Light ON | (10) OFF |
| (2) Passenger's airbag OFF indicator light | (7) Empty | (11) ON |
| (3) Occupant seating | (8) Child seat + infant | (12) Approx. 6 seconds |
| (4) Ignition switch | (9) Adult | (13) Approx. 2 seconds |
| (5) Light OFF | | |

INSPECTION

1. COMMUNICATION FOR INITIALIZING THE AIRBAG SYSTEM IS IMPOSSIBLE


Detecting condition:

Defective harness connector

Trouble symptom:

Communication is impossible between the airbag control module and the Subaru Select Monitor.

Note:

Perform "Inspection" for the Subaru Select Monitor in AIRBAG SYSTEM (DIAGNOSTICS).  [Ref. to AIRBAG\(DIAGNOSTICS\)>Subaru Select Monitor>INSPECTION.](#)

2. COMMUNICATION FOR INITIALIZING ONLY THE OCCUPANT DETECTION SYSTEM IS IMPOSSIBLE

Note:


The occupant detection system communicates with the Subaru Select Monitor via the airbag control module.

Detecting condition:

Defective harness connector between airbag control module and occupant detection control module

Trouble symptom:

Communication is impossible between the airbag control module and the occupant detection control module.

Perform the diagnosis from step 2 in [DTC B1650 OCCUPANT DETECTION SYSTEM MALFUNCTION].  [Ref. to OCCUPANT DETECTION\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1650 OCCUPANT DETECTION SYSTEM MALFUNCTION.](#)

OCCUPANT DETECTION(DIAGNOSTICS) > Subaru Select Monitor

OPERATION

For detailed operation procedures, refer to "Application help".

PROCEDURE

1. PERFORM CUSTOMER INTERVIEW.



Using the Check List for Interview, ask the customer the condition of how the trouble occurred. [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Check List for Interview>CHECK.](#)

Did you interview the customer?

Yes

[Go to 2.](#)

No

Interview the customer. [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Check List for Interview>CHECK.](#)

2. INITIALIZATION OF PRG SYS.



1. Open the PRG manually.
2. Manually close PRG to the partially latched position, and operate the power rear gate auto closer to fully close PRG.
3. Press any of the PRG operation switches to perform the automatic operation of PRG.

Is the initialization operation possible?

Yes

[Go to 4.](#)

No

[Go to 3.](#)

3. CHECK LAN SYSTEM.



Inspect LAN system. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

Is there any fault?


Yes

Perform the inspection according to the diagnosis for LAN system.


No

[Go to 4.](#)

4. CHECK POWER REAR GATE SYSTEM.


Using the Subaru Select Monitor, read DTC of power rear gate system.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Note:

If the communication function of the Subaru Select Monitor cannot be executed properly, check the communication circuit.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Subaru Select Monitor>INSPECTION.](#)

Is DTC displayed?


Yes

Record the DTCs, and perform the diagnosis for the displayed DTCs.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 5.](#)

5. CHECK DIAGNOSTICS WITH PHENOMENON.

Check "Diagnostics with Phenomenon".  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostics with Phenomenon.](#)

Does the symptom apply?




Yes

Perform diagnosis according to the procedures in the diagnostics with phenomenon.

No

 [Go to 6.](#)

6. CHECK TROUBLE PHENOMENON.

1. Perform the basic inspection.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>General Description>INSPECTION.](#)
2. Check the power rear gate CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Control Module I/O Signal.](#)
3. Check data monitor.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)
4. Perform a unit check.

Was the trouble cause found?

Yes

Repair or replace the cause of trouble.

No

Currently, the system is normal. A temporary poor contact may be a possible cause. Therefore, check the harness connector.

POWER REAR GATE(DIAGNOSTICS) > Check List for Interview

CHECK

- Inspect the following items regarding the vehicle’s state.
- Print out this page for interviewing customers.



Power Rear Gate System Check List for Interview			Date the Vehicle is	
Received	Year	Month	Day	
Customer’s name		Registration No.	Initial year of registration Year Month	
		Vehicle model	Date	
Inspector		Engine type	Frame number	
Interviewer	Inspector		Odometer reading	
Customer specified content				
<ul style="list-style-type: none"> • • • 				
Date and time when the trouble occurred		Frequency of trouble occurrence	Always occurs Sometimes occurs (times per day, times per month)	
Condition of trouble occurrence (How the trouble occurs)		Weather	Fine • Cloudy • Rainy • Snowy • Others ()	
		Temperature	°C (°F) — °C (°F)	
Road conditions		Occurrence location		
Accessory installation condition				
Confirmation of trouble condition	Power rear gate control module system			
	Drive unit system			
<input type="checkbox"/> Diagnostic Trouble Code				

POWER REAR GATE(DIAGNOSTICS) > Clear memory

OPERATION

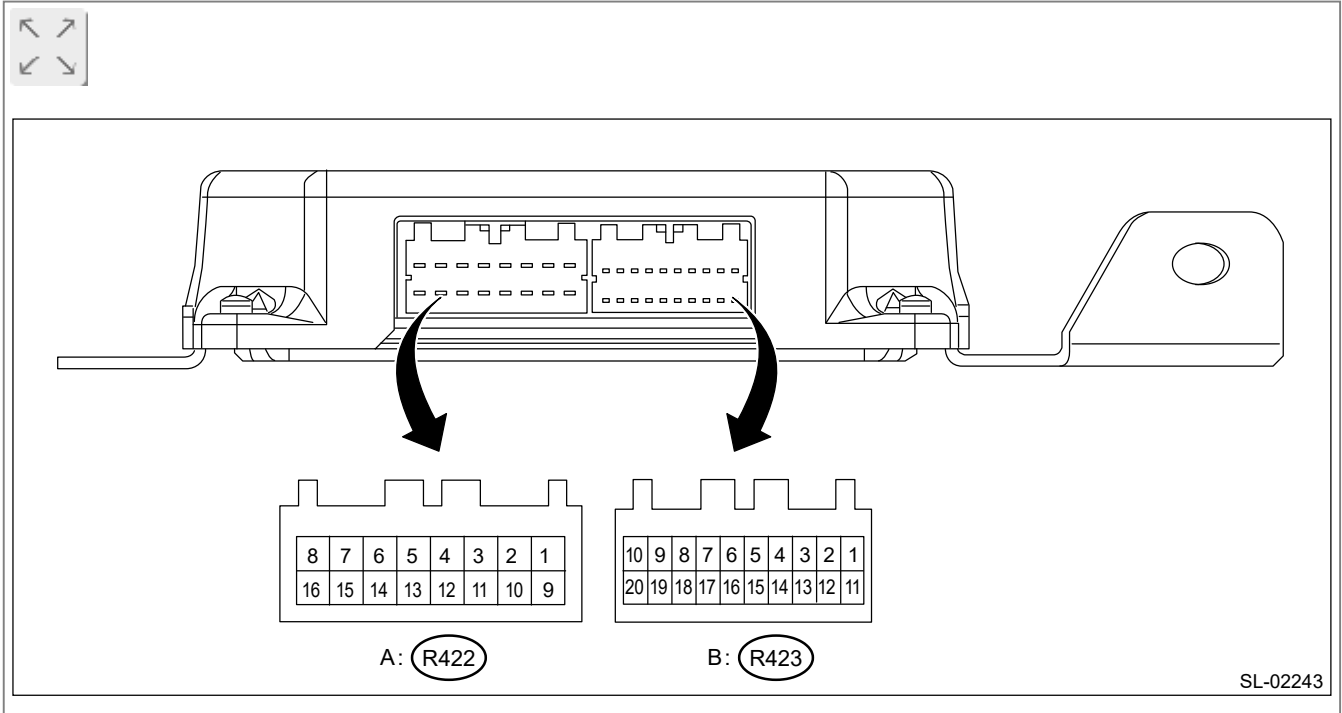
1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Power Rear Gate], and then select [Enter].
5. On [Select Function] display, select [DTC].
6. On [DTC] display, select [Clear memory].

Note:

For detailed operation procedures, refer to "Application help".

ELECTRICAL SPECIFICATION

1. POWER REAR GATE CONTROL MODULE



SL-02243

Terminal No. (terminal symbol)	Item	Measuring condition	Standard
(R422) No. 1 (+B) ↔ Chassis ground	Voltage	Always	10.5 – 16 V
(R422) No. 2 (SW-V) ↔ Chassis ground	Voltage	Always	10.5 – 16 V
(R422) No. 3 (CLUTCH (GND)) ↔ Chassis ground	Resistance	Always	Less than 1 Ω
(R422) No. 4 (SOL (-)) ↔ Chassis ground	Voltage	During solenoid cancellation output	Less than 1 V
(R422) No. 5 (CLOSER (OPEN)) ↔ Chassis ground	Voltage	When power rear gate auto closer is performing the release operation	10.5 – 16 V
(R422) No. 6 (SOL (COMMON)) ↔ Chassis ground	Voltage	Always	10.5 – 16 V
(R422) No. 7 (MOTOR (CLOSE)) ↔ Chassis ground	Voltage	When auto-close is in operation	10.5 – 16 V
(R422) No. 8 (+POWER B) ↔ Chassis ground	Voltage	Always	10.5 – 16 V
(R422) No. 9 (SEN-V) ↔	Voltage	Always	4 – 6 V

Chassis ground			
(R422) No. 10 (IGN) ↔ Chassis ground	Voltage	When ignition switch is ON	10.5 – 16 V
(R422) No. 11 (CLUTCH (+)) ↔ Chassis ground	Voltage	When auto-close is in operation	10.5 – 16 V
(R422) No. 12 (SOL (BUZZER)) ↔ Chassis ground	Resistanc e	When buzzer is OFF	Less than 1 Ω
(R422) No. 13 (CLOSER (CLOSE)) ↔ Chassis ground	Voltage	When power rear gate auto closer is in pull-in operation	10.5 – 16 V
(R422) No. 14 (P-GND) ↔ Chassis ground	Resistanc e	Always	Less than 1 Ω
(R422) No. 15 (MOTOR (OPEN)) ↔ Chassis ground	Voltage	When auto-open is in operation	10.5 – 16 V
(R422) No. 16 (SOL (+)) ↔ Chassis ground	Voltage	When solenoid lock is output	Less than 1 V
(R423) No. 1 (LIN) ↔ Chassis ground	—	Cannot be measured (LIN communication line)	—
(R423) No. 2 (HALF STOP SW) ↔ Chassis ground	Voltage	When memory height switch is ON	10.5 – 16 V
(R423) No. 3 (SOL POS SW) ↔ Chassis ground	Voltage	Except for PRG at half-stop state	4 – 6 V
(R423) No. 4 (SECTOR SW) ↔ Chassis ground	Voltage	When PRG is fully closed	Less than 1 V
(R423) No. 5 (-) ↔ Chassis ground	—	—	—
(R423) No. 6 (GATE SW) ↔ Chassis ground	Voltage	When PRG inner SW is ON	10.5 – 16 V
(R423) No. 7 (-) ↔ Chassis ground	—	—	—
(R423) No. 8 (S-GND) ↔ Chassis ground	Resistanc e	Always	Less than 1 Ω
(R423) No. 9 (-) ↔ Chassis ground	—	—	—
(R423) No. 10 (SEN-A) ↔ Chassis ground	Voltage	When PRG is stopped	4 – 6 V
(R423) No. 11 (T-SEN R) ↔ Chassis ground	Voltage	When sensor is ON	Less than 1 V
(R423) No. 12 (T SEN L) ↔ Chassis ground	Voltage	When sensor is ON	Less than 1 V
(R423) No. 13 (LATCH SW) ↔ Chassis ground	Voltage	When PRG is fully closed	4 – 6 V

(R423) No. 14 (COURTESY SW) ↔ Chassis ground	Voltage	When PRG is fully closed	4 — 6 V
(R423) No. 15 (HAZARD) ↔ Chassis ground	Voltage	When hazard switch is OFF	Less than 1 V
(R423) No. 16 (D SW) ↔ Chassis ground	Voltage	When driver's switch is ON	10.5 — 16 V
(R423) No. 17 (-) ↔ Chassis ground	—	—	—
(R423) No. 18 (T-SEN GND) ↔ Chassis ground	Resistance	Always	Less than 1 Ω
(R423) No. 19 (SEN-GND) ↔ Chassis ground	Resistance	Always	Less than 1 Ω
(R423) No. 20 (SEN-B) ↔ Chassis ground	Voltage	When PRG is stopped	4 — 6 V

POWER REAR GATE(DIAGNOSTICS) > Data Monitor

LIST

Item Name	Content	Standard	Note
+POWER B	Power supply voltage value Display range: 0.00 — 21.5 V	10.5 — 16 V	—
+ B	PRG CM power supply voltage value Display range: 0.00 — 21.5 V	10.5 — 16 V	—
IGN SW	Ignition switch status Display range: ON/OFF	ON: IGN ON OFF: IGN OFF	—
Memory stop SW	Memorized height switch status Display range: ON/OFF	ON: When the switch is ON OFF: When the switch is OFF	—
D SW	Driver's seat switch status Display range: ON/OFF	ON: When the switch is ON OFF: When the switch is OFF	—
R/G inner SW	PRG inner switch status Display range: ON/OFF	ON: When the switch is ON OFF: When the switch is OFF	—
COURTESY SW	Courtesy switch status Display range: ON/OFF	ON: When the switch is ON OFF: When the switch is OFF	—
LATCH SW	Latch switch status Display range: ON/OFF	ON: When the switch is ON OFF: When the switch is OFF	—
SECTOR SW	Sector switch status Display range: ON/OFF	ON: When the switch is ON OFF: When the switch is OFF	—
TOUCH SENSOR R	Right side touch sensor status Display range: ON/OFF	ON: When the switch is ON OFF: When the switch is OFF	—

TOUCH SENSOR L	Left side touch sensor status Display range: ON/OFF	ON: When the switch is ON OFF: When the switch is OFF	—
PRG MOTOR (OPEN)	Output status of rear gate motor open signal Display range: OPEN/OFF	OPEN: When rear gate is in open operation OFF: OFF	—
PRG MOTOR (CLOSE)	Output status of rear gate motor close signal Display range: CLOSE/OFF	CLOSE: When rear gate is in close operation OFF: OFF	—
CLUTCH(-)	Output status of drive unit clutch Display range: ON/OFF	ON: When clutch OFF is output OFF: OFF	—
CLUTCH(+)	Output status of drive unit clutch Display range: ON/OFF	ON: When clutch ON is output OFF: OFF	—
CLOSER (OPEN)	Output status of auto power rear gate closer motor open signal Display range: OPEN/OFF	OPEN: When open signal is output OFF: OFF	—
CLOSER (CLOSE)	Output status of auto power rear gate closer motor close signal Display range: CLOSE/OFF	CLOSE: When close signal is output OFF: OFF	—
BUZZER	Buzzer output status Display range: ON/OFF	ON: When buzzer sounds OFF: When buzzer stops	—
HAZARD	Hazard output status Display range: ON/OFF	ON: When hazard is ON OFF: When hazard is OFF	—
Pulse-count	Drive unit count information Display range: 0 — 765	—	—

Connection Continuing Flag	Display range: Flag / not Flag	Flag: not Flag:	—
PRG State	Rear gate status Display range: Fully open / Door free / Half Stop / In operation / Full Close	Fully open: Full open state Door free: Door-free state Half Stop: Suspended state In operation: In operation Full Close: Full closed state	—
Idle Stop Cancel Flag	Auto Start Stop cancel request status Display range: Flag / not Flag	Flag: When Auto Start Stop is canceled not Flag: When Auto Start Stop is active	—
HALF STOP SOL (Lock)	Output status of stop holding solenoid lock signal Display range: ON/OFF	ON: When solenoid lock is output OFF: When solenoid lock is not in operation	—
HALF STOP SOL (Cancel)	Output status of stop holding solenoid cancel signal Display range: ON/OFF	ON: When solenoid cancellation is output OFF: When solenoid is in operation	—
HALF STOP SOL POS SW	Display range: ON/OFF	ON: When maintaining standstill condition OFF: Not when maintaining standstill condition	—
IGN	Ignition switch status (body integrated unit) Display range: ON/OFF	ON: IGN ON OFF: IGN OFF	—
R/G Open SW	PRG opener switch status Display range: OFF / Short Push / Long Push	OFF: When OFF Short Push: When pressed shortly Long Push: When pressed long	—
Front Wheel Speed	Status of vehicle speed Display range: 0 — 229.5 km/h (0 — 142.6 MPH)	Shows vehicle speed	—

Normal Keyless R/G SW	Status of normal keyless R/G button Display range: OFF / Short Push / Long Push	OFF: When OFF Short Push: When pressed shortly Long Push: When pressed long	—
Smart Keyless R/G SW	Status of smart keyless R/G button Display range: OFF / Short Push / Long Push	OFF: When OFF Short Push: When pressed shortly Long Push: When pressed long	—
Idle Stop Control	Status of Auto Start Stop control Display range: Under Auto Start Stop control Idle Stop Control / Idle Stop Uncontrol	Idle Stop Control: Under Auto Start Stop control Idle Stop Uncontrol: Outside Auto Start Stop control	—
P range SW	Status of shift lever P Display range: ON/OFF	ON: P range OFF: Other than P range	—
Parking Brake SW	Status of parking brake switch Display range: ON/OFF	ON: When parking brake is ON OFF: When parking brake is OFF	—
MT/AT	Vehicle information (body integrated unit) Display range: MT/AT	MT: MT model AT: AT model	—
R/G Open Authorized State	Status of PRG permission Display range: Authorized State / Unauthorized State	Authorized State: PRG open permitted state Unauthorized State: PRG open not permitted state	—
Answer-Back Buzzer Information	Body integrated unit customizing information Display range: ON/OFF	ON: When buzzer is ON OFF: When buzzer is OFF	—

POWER REAR GATE(DIAGNOSTICS) > Data Monitor

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Power Rear Gate], and then select [Enter].
5. On [Select Function] display, select [Data monitor].

Note:

- **For detailed operation procedures, refer to “Application help”.**
- **Communication with PRG CM and Subaru Select Monitor takes time. It takes time to show all the items, and the status cannot be reflected on the display. Therefore, select items only that need to be checked or up to two to three items, when checking the status. (When displaying selected items only, place a check mark for the item to be displayed and press the “Select” button.)**

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2500 BATTERY POWER SUPPLY

DTC detecting condition:

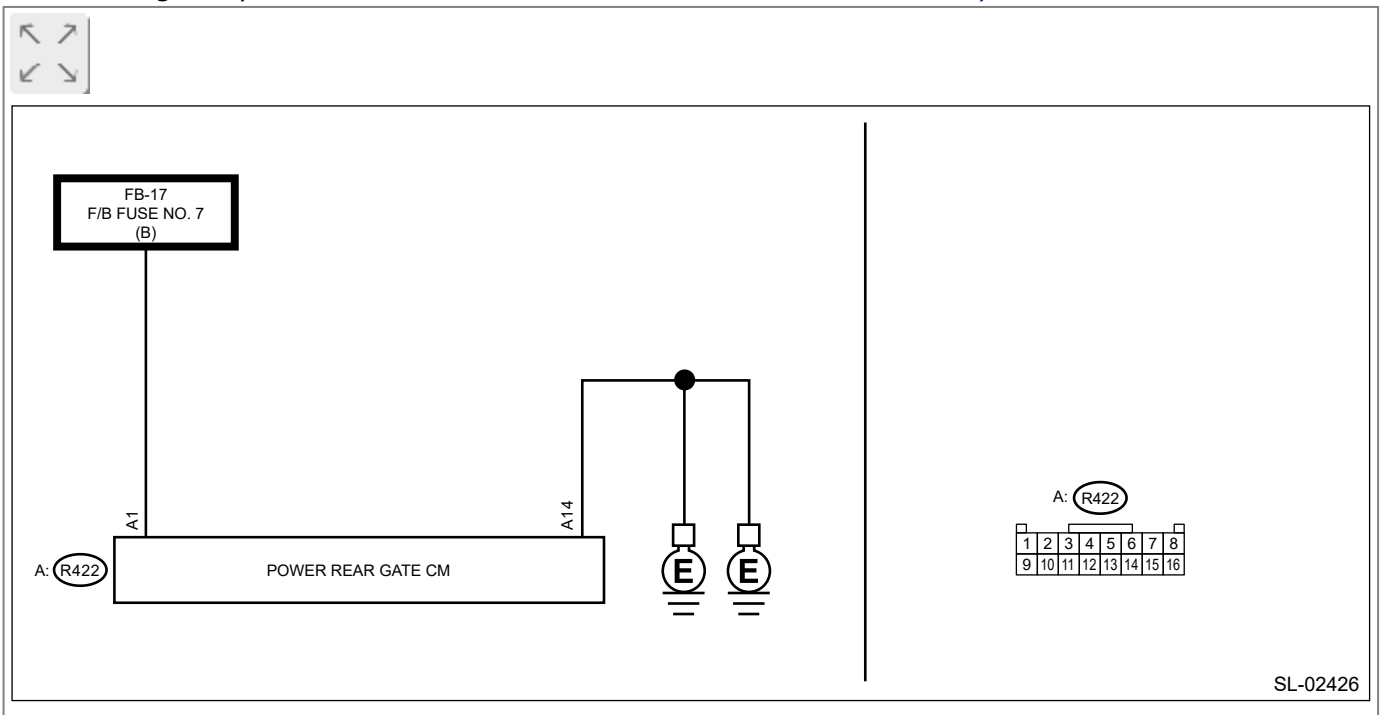
Detected when the power supply voltage is less than 10.5 V or 16 V or more at starting of PRG operation (when SW is operated).

Trouble symptom:


The power rear gate does not operate.

Wiring diagram:

Power rear gate system  [Ref. to WIRING SYSTEM>Power Rear Gate System>WIRING DIAGRAM.](#)



1. CHECK DTC.


1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2500 displayed? (Current malfunction)

 [Go to 2.](#)

 [Go to 3.](#)

2. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Manually close the rear gate to the partially latched position, and operate the power rear gate auto closer to fully close. (PRG initialization)
3. Press the operation SW to perform auto-open/close of PRG, and then return to the full-close position.
4. Turn the ignition switch to ON.
5. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2500 displayed? (Current malfunction)

Yes

 [Go to 4.](#)

No

 [Go to 3.](#)

3. CHECK DATA MONITOR.

Using Subaru Select Monitor, check [+ B].  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)

Is the value less than 10.5 V or 16 V or more?

Yes

 [Go to 4.](#)

No

Currently, the system is normal. A temporary poor contact may be a possible cause. Therefore, check the harness connector.

4. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse.  [Ref. to POWER REAR GATE SYSTEM>Relay and Fuse.](#)

Is the check result OK?

Yes

 [Go to 5.](#)

No

Replace the defective fuse. When the fuse is blown immediately, repair the short circuit.

5. CHECK HARNESS (POWER SUPPLY CIRCUIT).



1. Disconnect the PRG CM connector.
2. Using a tester, measure the voltage between the PRG CM connector and chassis ground.

Connector & terminal

(R422) No. 1 (+) — Chassis ground (-):

Is the voltage 10.5 V or more and less than 16 V?

Yes

 [Go to 6.](#)

No

Repair or replace the open circuit of harness.

6. CHECK HARNESS (OPEN CIRCUIT).



Using a tester, measure the resistance between the PRG CM connector and chassis ground.

Connector & terminal

(R422) No. 14 — Chassis ground:

Is the resistance less than 10 Ω ?

Yes

 [Go to 7.](#)

No

Repair or replace the open circuit of harness.


7. CHECK CONNECTOR.



Check for poor contact of connector.

Is the check result OK?

Yes

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No

Repair or replace the poor contact of connector.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC) DTC B2501 PRG ECU MALFUNCTION

DTC detecting condition:

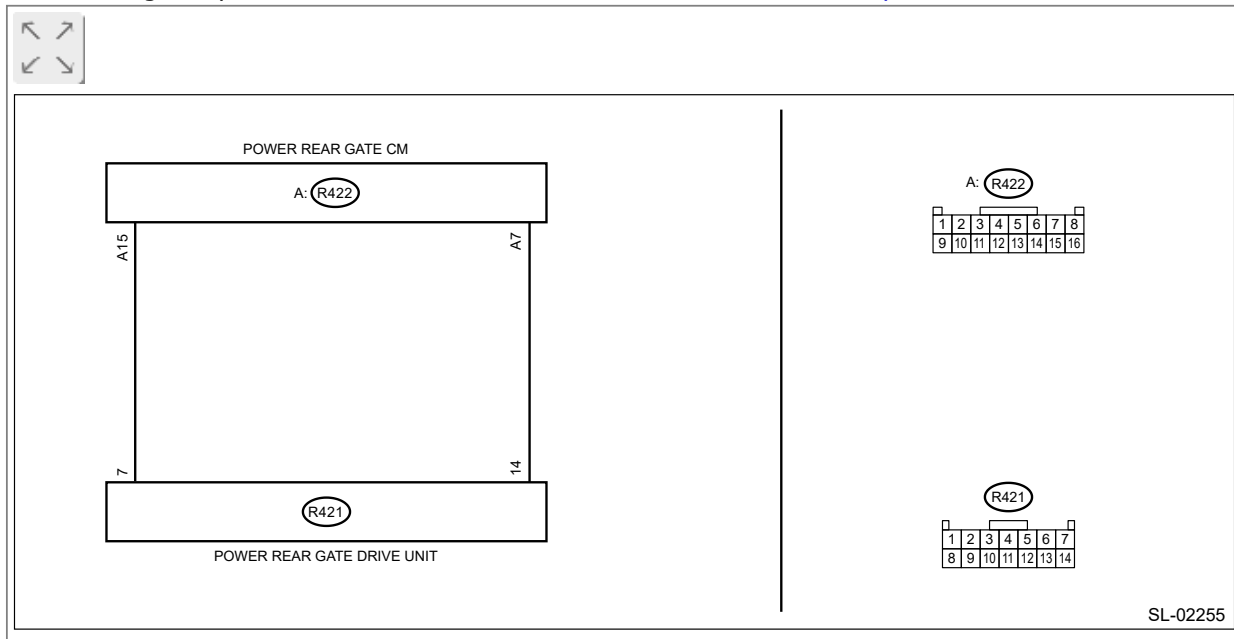
When improper operation of motor is detected.

Trouble symptom:


The open/close speed of power rear gate is too fast.

Wiring diagram:

Power rear gate system  [Ref. to WIRING SYSTEM>Power Rear Gate System>WIRING DIAGRAM.](#)



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2501 displayed? (Current malfunction)

Yes


 [Go to 2.](#)

No

 [Go to 3.](#)


2. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Manually close the rear gate to the partially latched position, and operate the power rear gate auto closer to fully close. (PRG initialization)
3. Press the operation SW to perform auto-open/close of PRG, and then return to the full-close position.
4. Turn the ignition switch to ON.


5. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2501 displayed? (Current malfunction)

Yes

 [Go to 4.](#)

No

 [Go to 3.](#)

3. CHECK CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Disconnect the PRG DU connector.
4. Check for poor contact of connector.

Is the check result OK?

Yes

A temporary change of voltage occurred.

No

Repair or replace the poor contact of connector.

4. CHECK HARNESS (OPEN CIRCUIT).



1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Disconnect the PRG DU connector.
4. Measure the resistance between ECM connector and PRG DU connector.

Connector & terminal

(R422) No. 7 — (R421) No. 14:

(R422) No. 15 — (R421) No. 7:

Is the resistance less than 10 Ω?

Yes

 [Go to 5.](#)

No

Repair or replace the open circuit of harness.

5. CHECK HARNESS (GROUND SHORT CIRCUIT).



Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(R422) No. 7 — Chassis ground:

(R422) No. 15 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 6.](#)

No

Repair or replace the short circuit of harness.

6. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).



Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(R422) No. 7 (+) — Chassis ground (—):

(R422) No. 15 (+) — Chassis ground (—):

Is the voltage less than 1 V?

Yes

 [Go to 7.](#)

No

Repair or replace the short circuit of harness.

7. CHECK PRG DU.



Measure the internal resistance of PRG.

Terminals


No. 7 —No. 14:

Is the resistance 0.3 Ω ?

Yes



 [Go to 8.](#)

No

Replace the PRG DU.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Drive Unit.](#)

8. CHECK PRG CM.



1. Connect the PRG CM connector.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)
2. Connect the PRG DU connector.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Drive Unit.](#)
3. Perform auto-open/close of the power rear gate.
4. Check the waveform using an oscilloscope.

Connector & terminal

(R422) No. 7 — (R422) No. 15:

Is waveform normal?


At open: DUTY 40 — 70%

At close: DUTY 60 — 80% (However, the value decreases to 30% at the moment of closing)
 For the waveform, refer to Note in the margin.

Yes

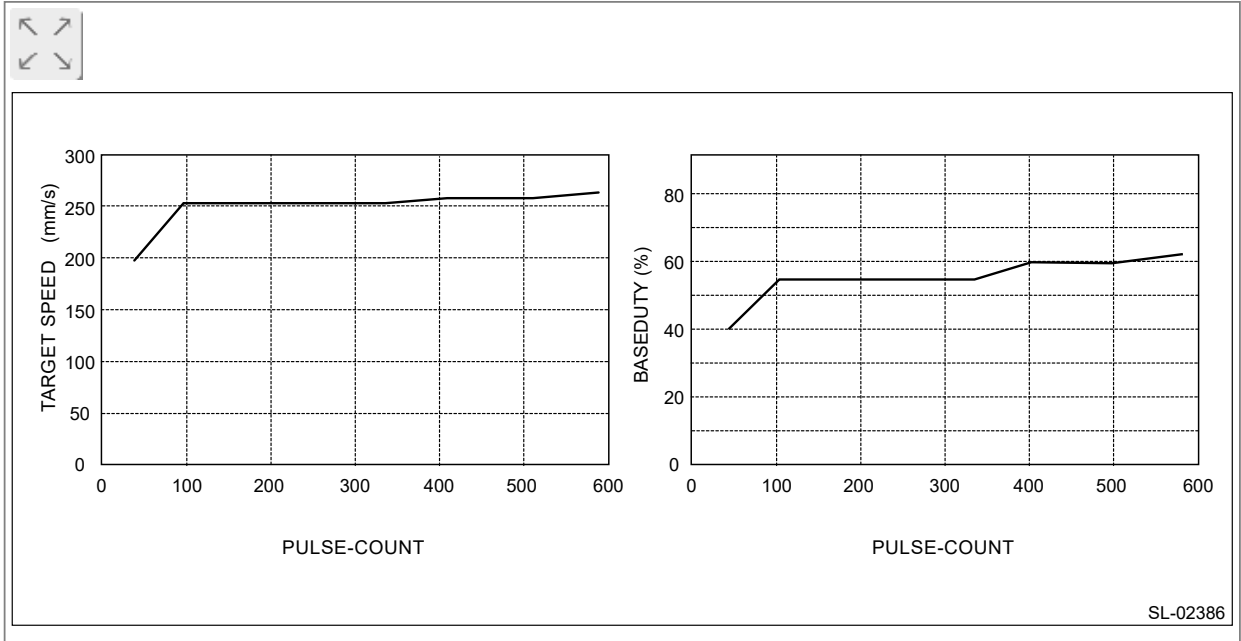
A temporary change of voltage occurred.

No

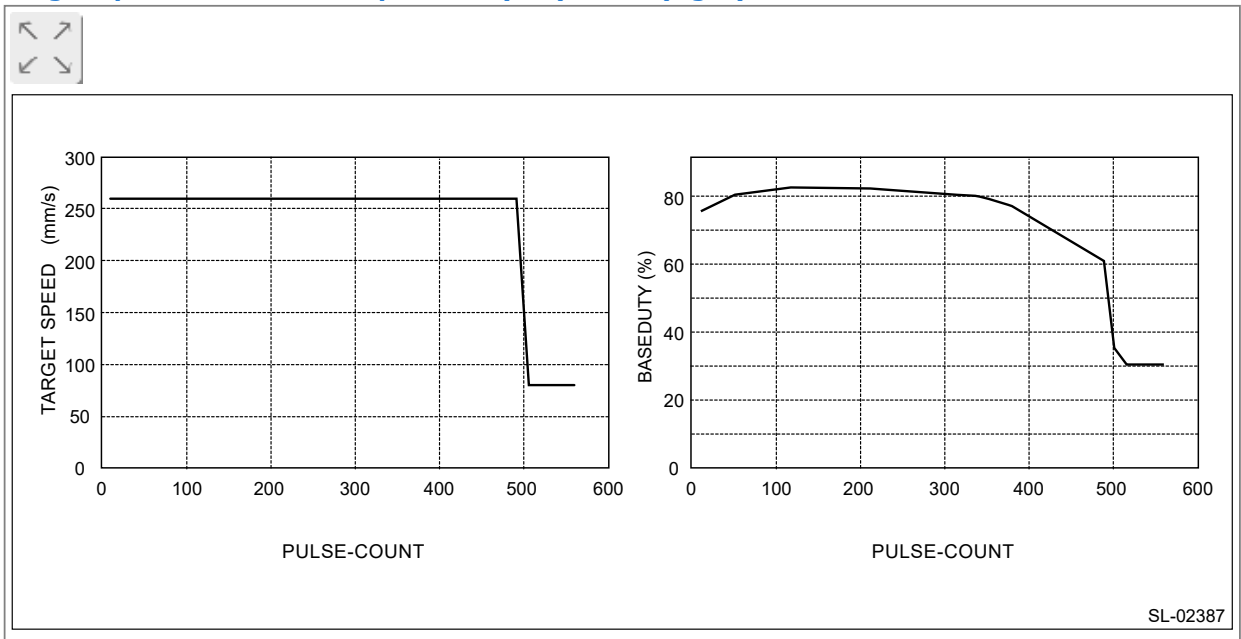
Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

Note:

- Target speed at PRG open operation (left) DUTY (right)




- Target speed at PRG close operation (left) DUTY (right)



- This malfunction code may be sensitively detected depending on the way users manually open or close the gate. If this malfunction code is stored in the memory as a past trouble but

not as a present trouble, the system is normal. If this malfunction code is stored in the memory as a present trouble, perform the following procedures.

[Procedure]

1. Clear the memory of PRG CM malfunction code using the Subaru Select Monitor.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Clear memory.](#)
2. Perform auto-open/close of PRG by using either one of the following operation switches.

	Switch	OPERATION
Open	Power rear gate driver's switch	Long Push
	Rear gate/trunk SW	Long Push
	Power rear gate opener button	Short Push
Close	Power rear gate driver's switch	Long Push
	Rear gate/trunk SW	Long Push
	Power rear gate inner switch	Short Push

3. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

If any present trouble is not stored in the memory after performing above procedures, the system is normal.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2502 TOUCH SENSORS (L) FAILURE

DTC detecting condition:

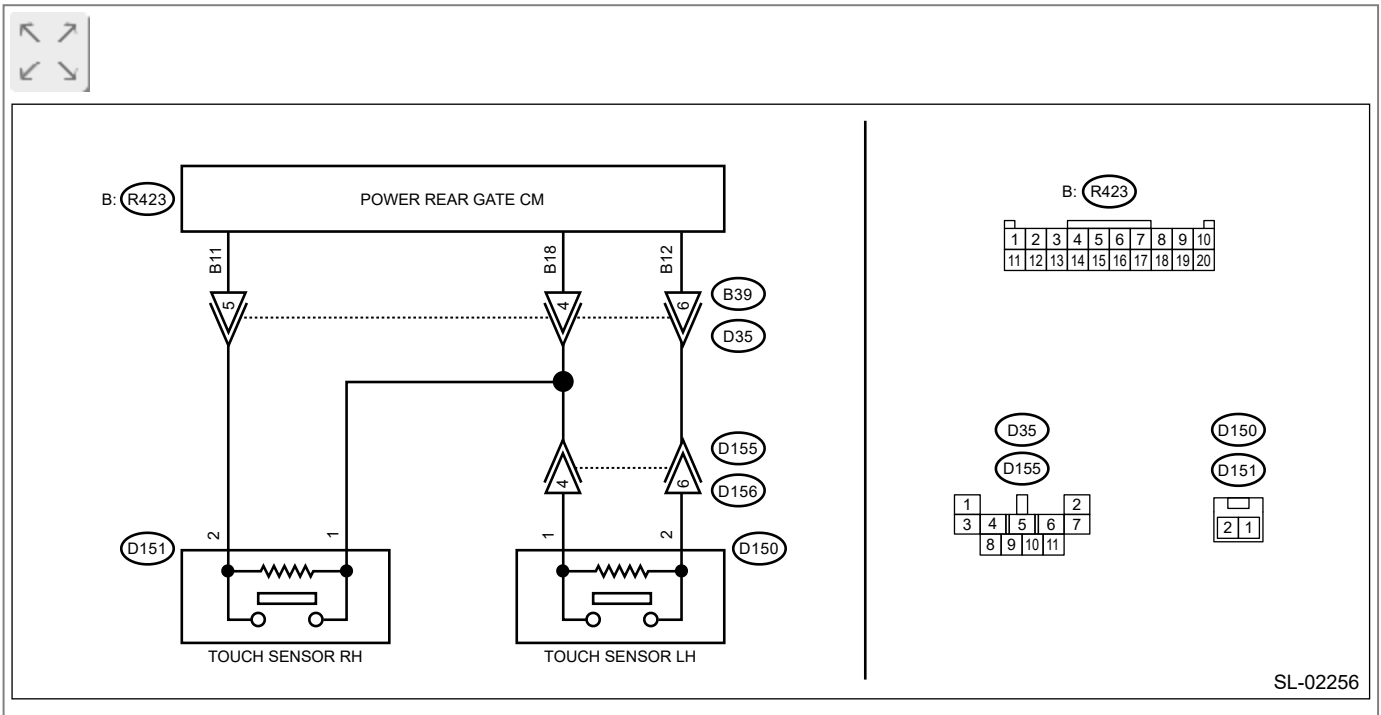
When malfunction in the touch sensor L is detected.

Trouble symptom:

The touch sensor L does not respond, and auto-operation does not function.


Wiring diagram:

Power rear gate system  [Ref. to WIRING SYSTEM>Power Rear Gate System>WIRING DIAGRAM.](#)





SL-02256


1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2502 displayed? (Current malfunction)


-  [Go to 2.](#)
-  [Go to 3.](#)

2. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Turn the ignition switch to ON.
3. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2502 displayed? (Current malfunction)


Yes

 [Go to 4.](#)

No

 [Go to 3.](#)

3. CHECK DATA MONITOR.

Using Subaru Select Monitor, check [TOUCH SENSOR L].  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)

Does the data change, when the touch sensor is pressed with fingers? (ON \longleftrightarrow OFF)

Yes

Currently, the system is normal. A temporary poor contact may be a possible cause. Therefore, check the harness connector.

No

 [Go to 4.](#)

4. CHECK SENSORS.

1. Turn the ignition switch to OFF.
2. Disconnect the touch sensor connector.
3. Measure the internal resistance of touch sensor.

Terminals


No. 1 — No. 2:

Is the resistance 100 Ω or less when the touch sensor is pressed with fingers, and 1 k Ω or more when not pressed?

Yes

 [Go to 5.](#)

No

Replace the touch sensor.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Touch Sensor.](#)

5. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the PRG CM connector.
2. Measure the resistance between PRG CM connector and touch sensor connector.


Connector & terminal

(D150) No. 2 – (R423) No. 12:

(D150) No. 1 – (R423) No. 18:

Is the resistance 10 Ω or less?

Yes

 [Go to 6.](#)

No

Repair or replace the open circuit of harness.

6. CHECK HARNESS (GROUND SHORT CIRCUIT).




Measure the resistance between the touch sensor connector and chassis ground.

Connector & terminal

(D150) No. 2 – Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 7.](#)

No

Repair or replace the short circuit of the harness.

7. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).




Measure the voltage between the touch sensor connector and chassis ground.

Connector & terminal

(D150) No. 1 (+) – Chassis ground (-):

Is the voltage less than 1 V?

Yes

 [Go to 8.](#)

No

Repair or replace the short circuit of the harness.


8. CHECK CONNECTOR.



Check for poor contact of connector.

Is the check result OK?

Yes

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No

Repair or replace the poor contact of connector.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2503 TOUCH SENSORS (R) FAILURE

DTC detecting condition:

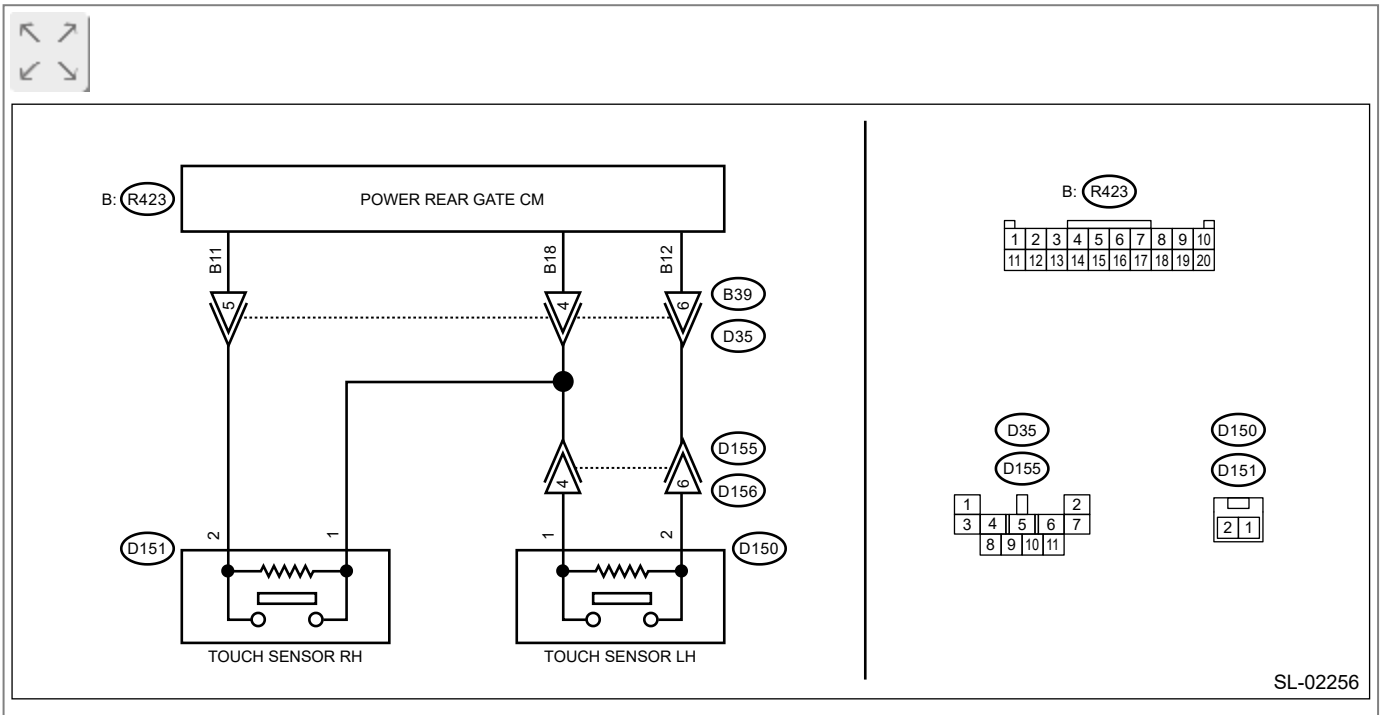
When malfunction in the touch sensor R is detected.

Trouble symptom:


The touch sensor R does not respond, and auto-operation does not function.

Wiring diagram:



Power rear gate system  [Ref. to WIRING SYSTEM>Power Rear Gate System>WIRING DIAGRAM.](#)




1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2503 displayed? (Current malfunction)


-  [Go to 2.](#)
-  [Go to 3.](#)

2. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Turn the ignition switch to ON.
3. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2503 displayed? (Current malfunction)


Yes

 [Go to 4.](#)

No

 [Go to 3.](#)

3. CHECK DATA MONITOR.

Using Subaru Select Monitor, check [TOUCH SENSOR R].  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)

Does the data change, when the touch sensor is pressed with fingers? (ON \longleftrightarrow OFF)

Yes

Currently, the system is normal. A temporary poor contact may be a possible cause. Therefore, check the harness connector.

No

 [Go to 4.](#)

4. CHECK SENSORS.

1. Turn the ignition switch to OFF.
2. Disconnect the touch sensor connector.
3. Measure the internal resistance of touch sensor.

Terminals


No. 1 — No. 2:

Is the resistance 100 Ω or less when the touch sensor is pressed with fingers, and 1 k Ω or more when not pressed?

Yes

 [Go to 5.](#)

No

Replace the touch sensor.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Touch Sensor.](#)

5. CHECK HARNESS (OPEN CIRCUIT).

Measure the resistance between PRG CM connector and touch sensor connector.


Connector & terminal

(D151) No. 2 — (R423) No. 11:

(D151) No. 1 — (R423) No. 18:

Is the resistance 10 Ω or less?

Yes

 [Go to 6.](#)

No

Repair or replace the open circuit of harness.

6. CHECK HARNESS (GROUND SHORT CIRCUIT).



Measure the resistance between the touch sensor connector and chassis ground.

Connector & terminal

(D151) No. 2 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 7.](#)

No

Repair or replace the short circuit of the harness.

7. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).



Measure the voltage between the touch sensor connector and chassis ground.

Connector & terminal

(D151) No. 1 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes

 [Go to 8.](#)

No

Repair or replace the short circuit of the harness.


8. CHECK CONNECTOR.



Check for poor contact of connector.

Is the check result OK?

Yes

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)


No

Repair or replace the poor contact of connector.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2504 TOUCH SENSORS (L) ON FIXATION


Note:

For the diagnostic procedure, refer to DTC B2502.  Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2502 TOUCH SENSORS (L) FAILURE.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2505 TOUCH SENSORS (R) ON FIXATION

Note:

For the diagnostic procedure, refer to DTC B2503.  Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2503 TOUCH SENSORS (R) FAILURE.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2506 PRG MOTOR CURRENT SURGE

DTC detecting condition:

When excessive load is applied to the PRG motor, and overcurrent is detected.

Trouble symptom:

The PRG auto-operation does not function, operation speed is slow, and incorrect reverse operation occurs.

1. CHECK FOR OBSTACLES.


Check that the peripheral area of the rear gate is free from snow or any object that blocks open/close operation.

Is the peripheral area of the rear gate free from snow or any object that blocks open/close operation?

Yes

 [Go to 2.](#)

No

Remove the obstacles, and  [Go to 2.](#)

2. CHECK POWER REAR GATE OPERATION.

1. Turn the ignition switch to OFF.
2. Fully close the rear gate.
3. Turn the memory height switch to OFF.
4. Perform the auto-open operation.
5. Perform the auto-close operation from the full open position.

Is the operation OK?


Yes

 [Go to 4.](#)

No

 [Go to 3.](#)


3. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR](#)


[GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2506 displayed? (Current malfunction)


Yes

 [Go to 4.](#)

No


 [Go to 5.](#)

4. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Perform auto-operation with the procedure in step 2.
3. Turn the ignition switch to ON.
4. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2506 displayed? (Current malfunction)

Yes

 [Go to 5.](#)

No


System is normal. Temporary excess load was applied.

5. CHECK PRG DU WITH MANUAL OPERATION.


1. Turn the ignition switch to OFF.
2. Fully close the rear gate.
3. Press and hold the PRG opener button to perform the manual operation.
4. Check the weight while performing the manual operation.

Is the operation possible without abnormal weight?

Yes

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No

Replace the PRG DU.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Drive Unit.](#)

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2507 PRG MOTOR CIRCUIT OPEN

DTC detecting condition:

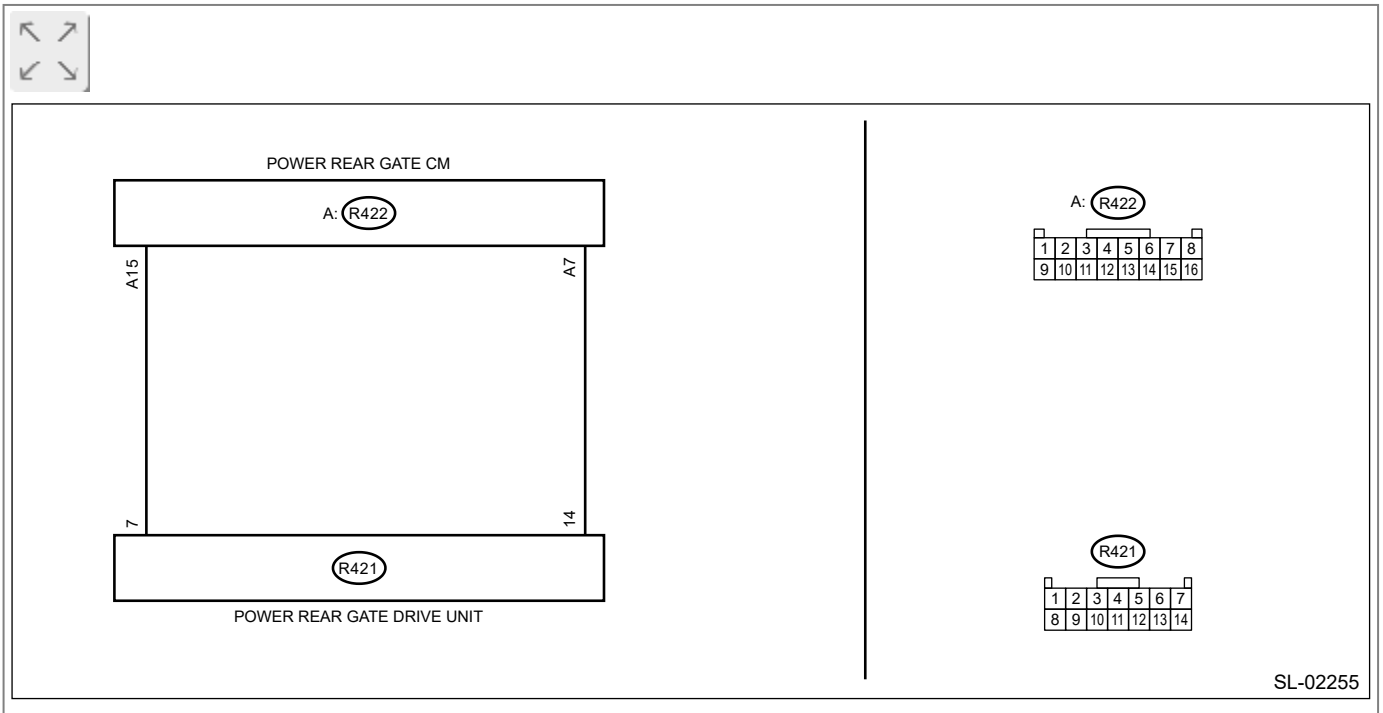
When the open circuit in motor circuit is detected.

Trouble symptom:


During the auto-operation, the operation stop, half-stop state cannot be cancelled, and auto-operation is not possible.

Wiring diagram:



Power rear gate system  [Ref. to WIRING SYSTEM>Power Rear Gate System>WIRING DIAGRAM.](#)




1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2507 displayed? (Current malfunction)

-  [Go to 2.](#)
-  [Go to 3.](#)

2. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Manually close the rear gate to the partially latched position, and operate the power rear gate auto closer to fully close. (PRG initialization)
3. Press the operation SW to perform auto-open/close of PRG, and then return to the full-close position.
4. Turn the ignition switch to ON.
5. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2507 displayed? (Current malfunction)

Yes

 [Go to 4.](#)

No

 [Go to 3.](#)

3. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Disconnect the PRG DU connector.
4. Check for poor contact of connector.

Is the check result OK?

Yes

A temporary change of voltage occurred.

No

Repair or replace the poor contact of connector.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Disconnect the PRG DU connector.
4. Measure the resistance between PRG CM connector and PRG DU connector.

Connector & terminal

(R422) No. 15 – (R421) No. 7:

(R422) No. 7 – (R421) No. 14:

Is the resistance 10 Ω or less?

 [Go to 5.](#)

Yes

No

Repair or replace the open circuit of harness.

5. CHECK HARNESS (GROUND SHORT CIRCUIT).



Measure the resistance between PRG CM connector and chassis ground.


Connector & terminal

(R422) No. 15 — Chassis ground:

(R422) No. 7 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 6.](#)

No

Repair or replace the short circuit of the harness.

6. CHECK PRG DU.



Measure the internal resistance of PRG DU.

Terminals


No. 7 —No. 14:

Is the resistance 0.3 Ω ?

Yes

 [Go to 7.](#)

No

Replace the PRG DU.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Drive Unit.](#)


7. CHECK CONNECTOR.



Check for poor contact of connector.

Is the check result OK?

Yes

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No

Repair or replace the poor contact of connector.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2508 PRG MOTOR CIRCUIT LOW

DTC detecting condition:

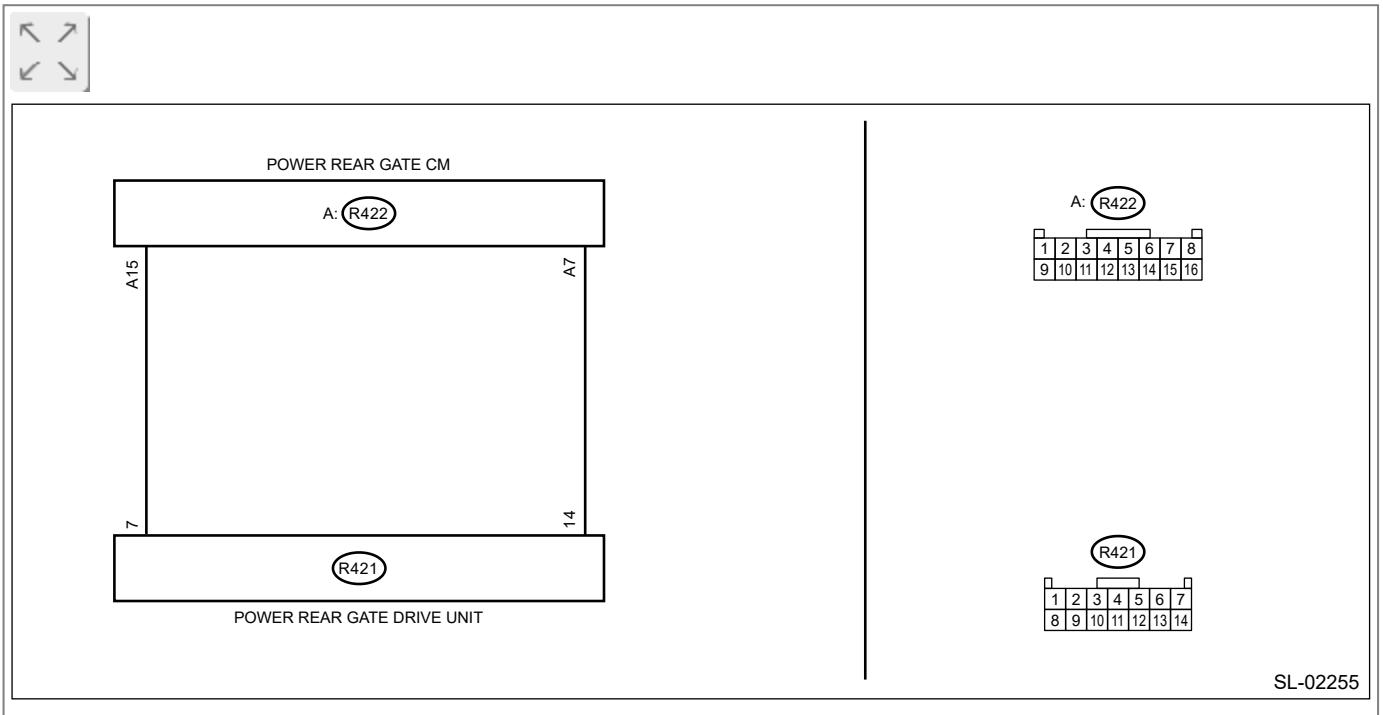
When the GND-output short in motor circuit is detected.

Trouble symptom:


Auto-operation speed is too fast.

Wiring diagram:



Power rear gate system  [Ref. to WIRING SYSTEM>Power Rear Gate System>WIRING DIAGRAM.](#)




1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2508 displayed? (Current malfunction)


-  [Go to 2.](#)
-  [Go to 3.](#)

2. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Manually close the rear gate to the partially latched position, and operate the power rear gate auto closer to fully close. (PRG initialization)
3. Press the operation SW to perform auto-open/close of PRG, and then return to the full-close position.
4. Turn the ignition switch to ON.
5. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2508 displayed? (Current malfunction)

Yes

 [Go to 4.](#)

No

 [Go to 3.](#)

3. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Disconnect the PRG DU connector.
4. Check for poor contact of connector.

Is the check result OK?

Yes

A temporary change of voltage occurred.

No

Repair or replace the poor contact of connector.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Disconnect the PRG DU connector.
4. Measure the resistance between PRG CM connector and chassis ground.

Connector & terminal

(R422) No. 15 — Chassis ground:

(R422) No. 7 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 5.](#)

No

Repair or replace the short circuit of the harness.

5. CHECK PRG DU.


Measure the internal resistance of PRG DU.

Terminals


No. 7 —No. 14:

Is the resistance 0.3 Ω ?

Yes

 [Go to 6.](#)

No


Replace the PRG DU.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Drive Unit.](#)

6. CHECK CONNECTOR.

Check for poor contact of connector.

Is there poor contact of connector?

Yes

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No

Repair or replace the poor contact of connector.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2509 CLUTCH OPEN

DTC detecting condition:

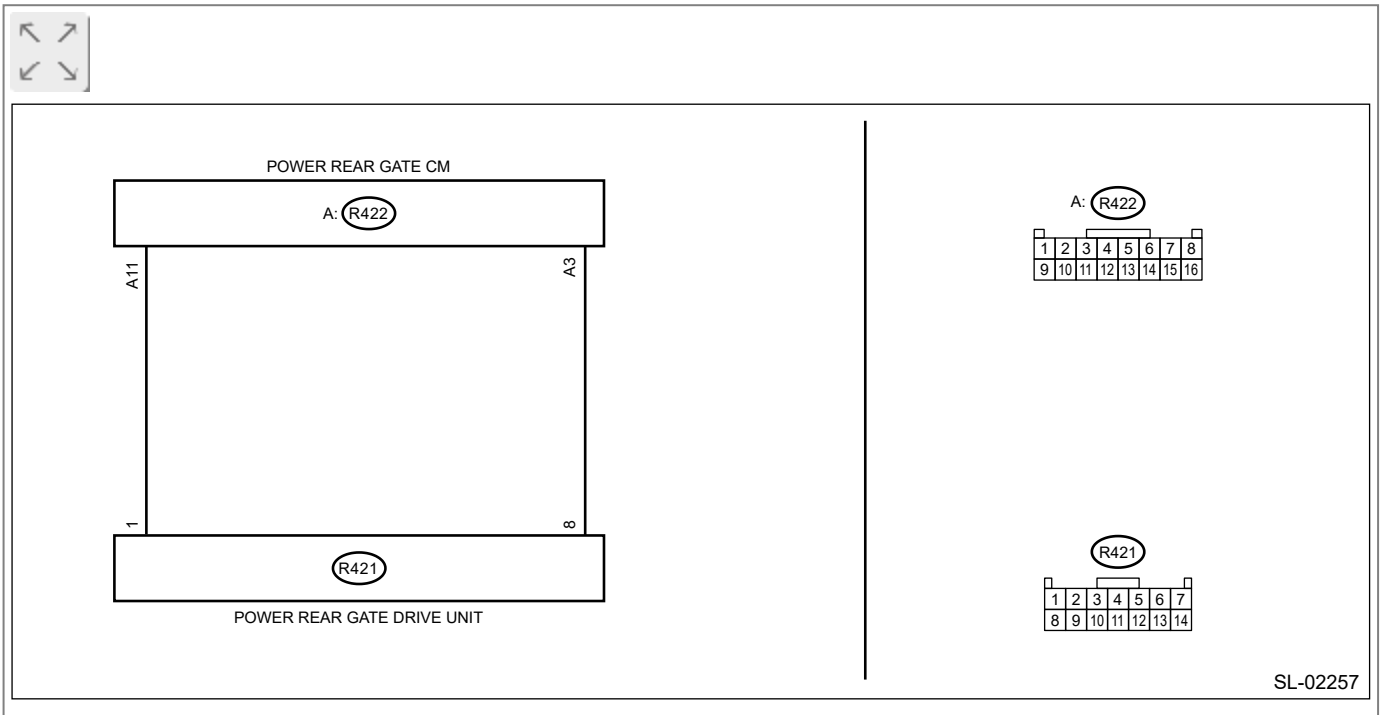
When the open circuit or short circuit in CLUTCH circuit is detected.

Trouble symptom:


During the auto-operation, door free, auto-operation do not function.

Wiring diagram:

Power rear gate system  [Ref. to WIRING SYSTEM>Power Rear Gate System>WIRING DIAGRAM.](#)



1. CHECK DTC.


1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2509 displayed? (Current malfunction)

 [Go to 2.](#)

 [Go to 3.](#)

2. CHECK DTC.


1. Turn the ignition switch to OFF.
2. Manually close the rear gate to the partially latched position, and operate the power rear gate auto closer to fully close. (PRG initialization)
3. Press the operation SW to perform auto-open/close of PRG, and then return to the full-close position.
4. Turn the ignition switch to ON.
5. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2509 displayed? (Current malfunction)

Yes

 [Go to 4.](#)

No

 [Go to 3.](#)

3. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Disconnect the PRG DU connector.
4. Check for poor contact of connector.

Is the check result OK?

Yes

A temporary change of voltage occurred.

No

Repair or replace the poor contact of connector.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Disconnect the PRG DU connector.
4. Measure the resistance between PRG CM connector and PRG DU connector.

Connector & terminal

(R422) No. 11 — (R421) No. 1:

(R422) No. 3 — (R421) No. 8:

Is the resistance 10 Ω or less?

Yes

 [Go to 5.](#)

No

Repair or replace the open circuit of harness.

5. CHECK HARNESS (GROUND SHORT CIRCUIT).

Measure the resistance between PRG CM connector and chassis ground.


Connector & terminal

(R422) No. 3 — Chassis ground:

(R422) No. 11 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 6.](#)

No

Repair or replace the short circuit of the harness.

6. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

Measure the voltage between PRG CM connector and chassis ground.


Connector & terminal

(R422) No. 3 (+) — Chassis ground (-):

(R422) No. 11 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes

 [Go to 7.](#)

No

Repair or replace the short circuit of the harness.

7. CHECK PRG DU.

Measure the internal resistance of PRG DU.

Terminals


No. 1 —No. 8:

Is the resistance 9.6 Ω ±10%?

Yes

 [Go to 8.](#)

No

Replace the PRG DU.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Drive Unit.](#)


8. CHECK CONNECTOR.



Check for poor contact of connector.

Is the check result OK?

Yes

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No

Repair or replace the poor contact of connector.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B250A TOUCH SENSORS BATT. GND SHORT OUT

DTC detecting condition:

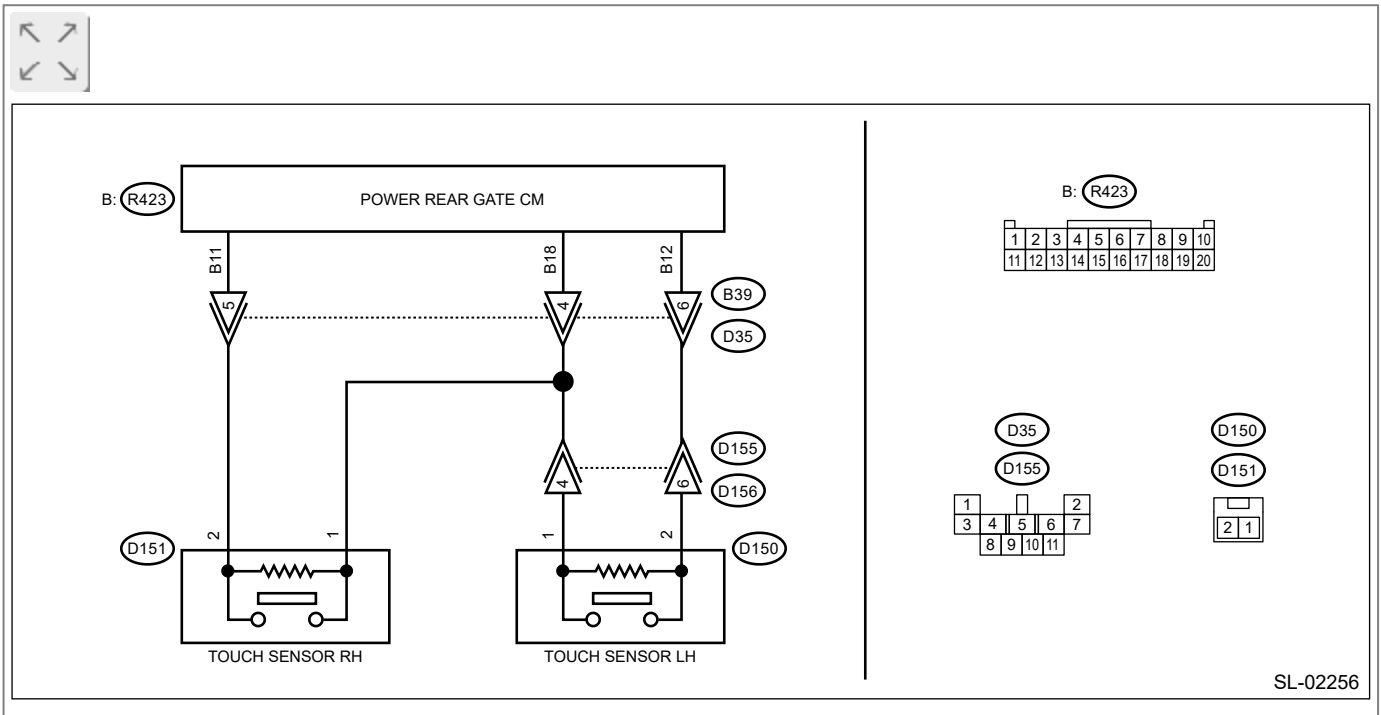
When malfunction in the touch sensor is detected.

Trouble symptom:

The touch sensor does not respond, and auto-operation does not function.


Wiring diagram:

Power rear gate system  [Ref. to WIRING SYSTEM>Power Rear Gate System>WIRING DIAGRAM.](#)



SL-02256

1. CHECK DTC.


1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B250A displayed? (Current malfunction)


Yes

 [Go to 2.](#)

No


 [Go to 3.](#)

2. CHECK DTC.


1. Turn the ignition switch to OFF.
2. Turn the ignition switch to ON.
3. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B250A displayed? (Current malfunction)

Yes

 [Go to 3.](#)

No

 [Go to 3.](#)

3. CHECK DATA MONITOR.


Check [TOUCH SENSOR L] and [TOUCH SENSOR R] using Subaru Select Monitor.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)

Does the data change, when the touch sensor is pressed with fingers? (ON \longleftrightarrow OFF)

Yes

System is normal.

No

 [Go to 4.](#)

4. CHECK TOUCH SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the touch sensor connector.
3. Measure the internal resistance of touch sensor.

Terminals

Touch sensor RH

No. 1 —No. 2:

Touch sensor LH


No. 1 —No. 2:

Is the resistance 100 Ω or less when the touch sensor is ON, and 1 k Ω or more when OFF?

Yes

 [Go to 5.](#)

No

Replace the touch sensor.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Touch Sensor.](#)

5. CHECK HARNESS (OPEN CIRCUIT).



Measure the resistance between PRG CM connector and touch sensor connector.

Connector & terminal

(R423) No. 12 — (D150) No. 2:

(R423) No. 11 — (D151) No. 2:

(R423) No. 18 — (D150) No. 1:

(R423) No. 18 — (D151) No. 1:

Is the resistance 10 Ω or less?

Yes

 [Go to 6.](#)

No

Repair or replace the open circuit of harness.

6. CHECK HARNESS (GROUND SHORT CIRCUIT).



Measure the resistance between PRG CM connector and chassis ground.

Connector & terminal

(R423) No. 12 — Chassis ground:

(R423) No. 11 — Chassis ground:

Is the resistance 1 k Ω or more?

Yes

 [Go to 7.](#)

No

Repair or replace the short circuit of the harness.

7. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).



Measure the voltage between PRG CM connector and chassis ground.


Connector & terminal

(R423) No. 12 (+) — Chassis ground (-):

(R423) No. 11 (+) — Chassis ground (-):

Is the voltage 1 V or more?

Yes

 [Go to 8.](#)

No

Repair or replace the short circuit of the harness.


8. CHECK CONNECTOR.



1. Disconnect the PRG CM connector.
2. Check for poor contact of connector.

Is the check result OK?

Yes

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No

Repair or replace the poor contact of connector.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B250B ROTATION SENSOR A STUCK

DTC detecting condition:

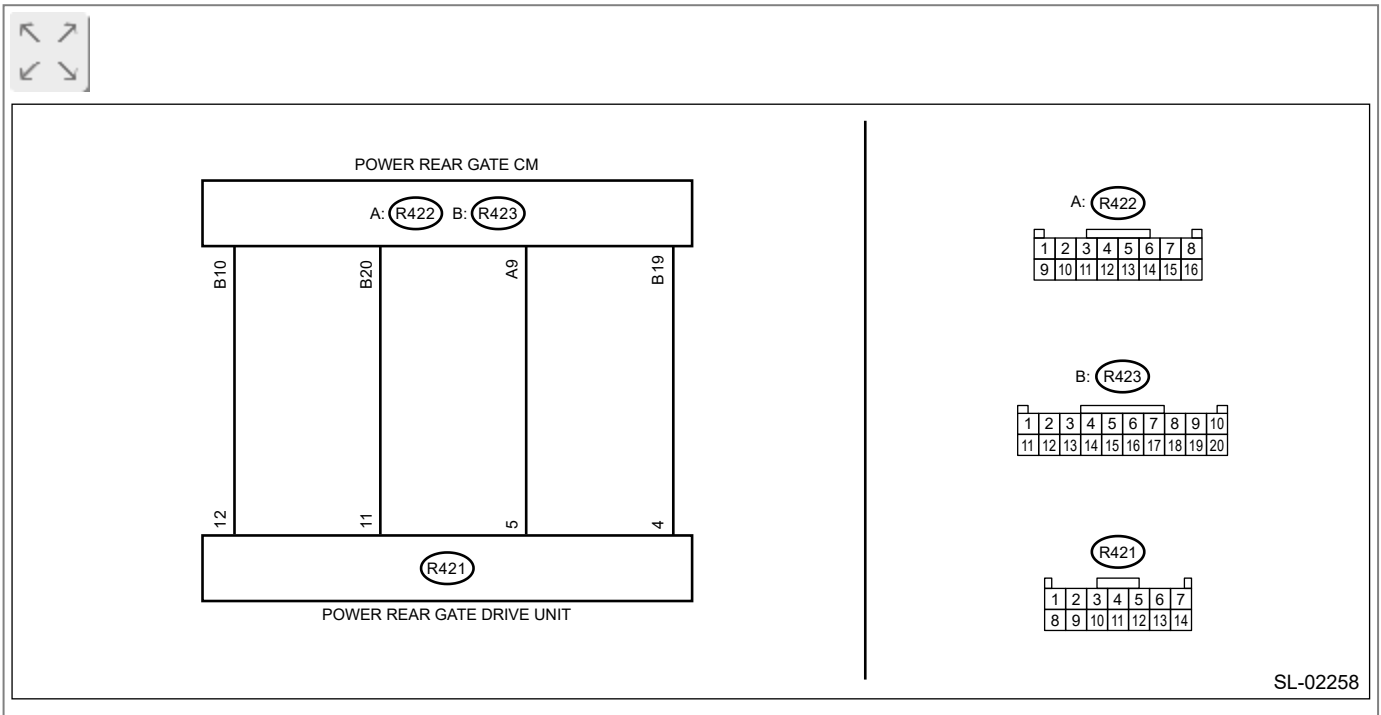
When malfunction in the rotation sensor is detected.

Trouble symptom:

The R/G opens or closes by itself, while pausing intermittently in between. (intermittent clutch mode)


Wiring diagram:

Power rear gate system  [Ref. to WIRING SYSTEM>Power Rear Gate System>WIRING DIAGRAM.](#)




SL-02258

1. CHECK DTC.


1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B250B, B250D, B250F or B2511 displayed? (Current malfunction)


Yes

 [Go to 2.](#)

No


 [Go to 3.](#)

2. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Manually close the rear gate to the partially latched position, and operate the power rear gate auto closer to fully close. (PRG initialization)
3. Press the operation SW to perform auto-open/close of PRG, and then return to the full-close position.
4. Turn the ignition switch to ON.
5. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B250B, B250D, B250F or B2511 displayed? (Current malfunction)

Yes

 [Go to 4.](#)

No

 [Go to 3.](#)

3. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Check for poor contact of connector.

Is the check result OK?

Yes

A temporary change of voltage occurred.

No

Repair or replace the poor contact of connector.

4. CHECK PRG CM.

Measure the voltage between PRG CM connector and chassis ground.

Connector & terminal

(R422) No. 9 (+) — Chassis ground (—):

Is the voltage 4 — 6 V?


Yes

 [Go to 5.](#)

No

Check the PRG CM power supply circuit.

5. CHECK DATA MONITOR.

1. Turn the ignition switch to ON.
2. Using Subaru Select Monitor, check [Pulse-count].  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)

When the PRG driver's SW is pressed and held to perform the auto-operation, is the value of [Pulse-count] change?

Yes

Currently, the system is normal. A temporary poor contact may be a possible cause. Therefore, check the harness connector.

No

 [Go to 6.](#)

6. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Disconnect the PRG DU connector.
4. Measure the resistance between PRG CM connector and PRG DU connector.

Connector & terminal

(R423) No. 10 — (R421) No. 12:

(R423) No. 20 — (R421) No. 11:

(R423) No. 19 — (R421) No. 4:

(R422) No. 9 — (R421) No. 5:

Is the resistance 10 Ω or less?

Yes

 [Go to 7.](#)

No

Repair or replace the open circuit of harness.

7. CHECK HARNESS (GROUND SHORT CIRCUIT).

Measure the resistance between PRG CM connector and chassis ground.

Connector & terminal

(R423) No. 10 — Chassis ground:

(R423) No. 20 — Chassis ground:

(R422) No. 9 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 8.](#)

No

Repair or replace the short circuit of the harness.

8. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).



Measure the voltage between PRG CM connector and chassis ground.

Connector & terminal

(R423) No. 10 (+) – Chassis ground (–):

(R423) No. 20 (+) – Chassis ground (–):

(R422) No. 9 (+) – Chassis ground (–):

Is the voltage less than 1 V?

Yes

 [Go to 9.](#)

No

Repair or replace the short circuit of the harness.

9. CHECK ROTATION SENSOR SIGNAL.



1. Connect the disconnected connectors.
2. Using an oscilloscope, measure the voltage of rotation sensor.


Connector & terminal

(R423) No. 10 (+) – (R423) No. 19 (–):


(R423) No. 20 (+) – (R423) No. 19 (–):

Does the voltage change, when PRG is manually opened/closed? (0 V ↔ 5 V)

Yes

 [Go to 10.](#)

No

Replace the PRG DU.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Drive Unit.](#)


10. CHECK CONNECTOR.



1. Disconnect the PRG CM connector.
2. Check for poor contact of connector.

Is the check result OK?

Yes

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No

Repair or replace the poor contact of connector.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B250D ROTATION SENSOR B STUCK

Note:

For the diagnostic procedure, refer to DTC B250B.  Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B250B ROTATION SENSOR A STUCK.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B250F ROTATION SENSOR PULSE/COUNT

Note:

For the diagnostic procedure, refer to DTC B250B.  Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B250B ROTATION SENSOR A STUCK.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2511 ROTATION SENSOR PULSE/REVERSE DIRECTION

Note:

For the diagnostic procedure, refer to DTC B250B.  Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B250B ROTATION SENSOR A STUCK.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2512 DAMPER BREAKAGE


DTC detecting condition:

When malfunction in the gas damper is detected.

Trouble symptom:

After the auto-open operation, auto-close operation occurs by itself. When PRG is open in manual operation, the gate is not held at the full-open position.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2512 displayed? (Current malfunction)

Yes

 [Go to 2.](#)

No

PRG moved to the close-direction immediately after the auto-open operation due to temporary external force.

2. CHECK DAMPER.


1. Fully open PRG in manual operation.
2. Check the door behavior at the full-open position.

Is PRG held at the full-open position?

Yes

PRG moved to the close-direction immediately after the auto-open operation due to temporary external force.

No

Replace the damper.  [Ref. to EXTERIOR BODY PANELS>Rear Gate>REMOVAL > REAR GATE DAMPER STAY.](#)

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2513 LATCH CONDITION

DTC detecting condition:

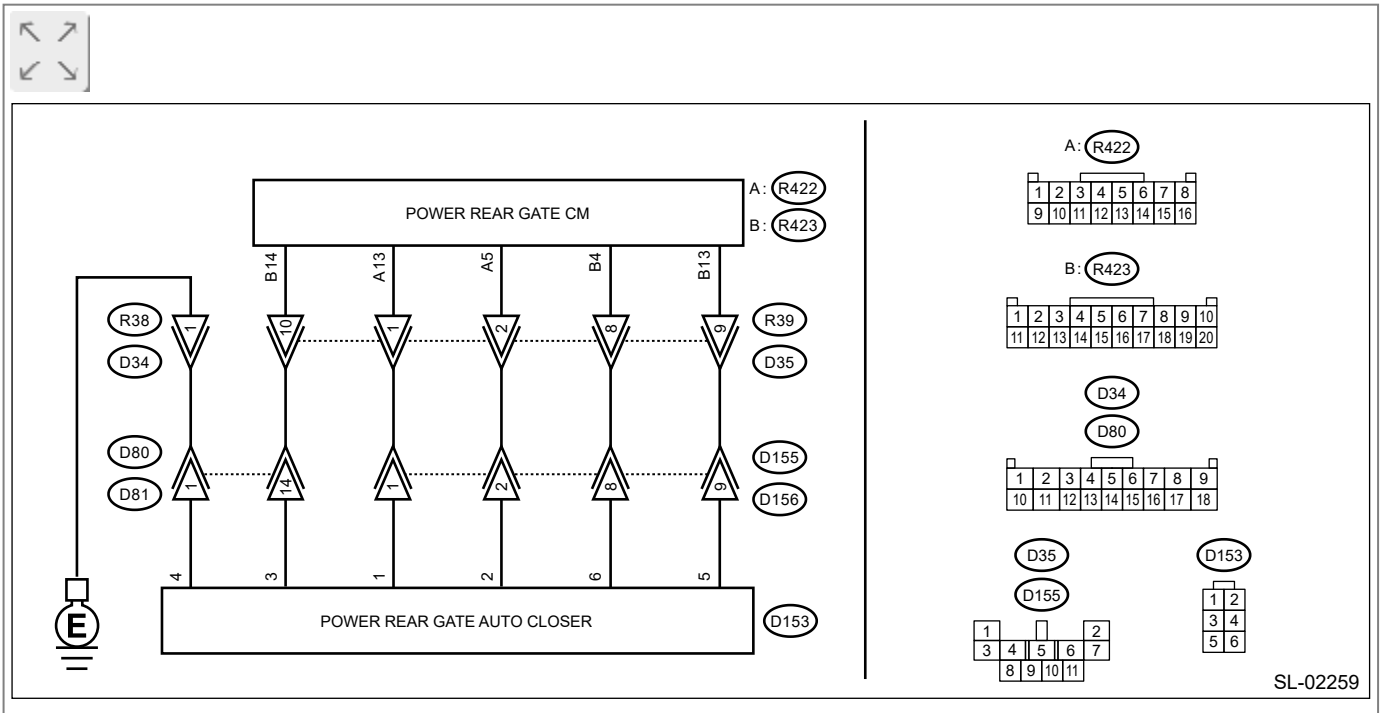
When malfunction in SW within the power rear gate auto closer is detected.

Trouble symptom:

- The PRG opens or closes by itself, while pausing intermittently in between during the auto-operation. (intermittent clutch mode)
- Auto-operation does not function.


Wiring diagram:

Power rear gate system  [Ref. to WIRING SYSTEM>Power Rear Gate System>WIRING DIAGRAM.](#)



SL-02259

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is B2513, B2515, B2516 or B2517 displayed? (Current malfunction)

Yes  [Go to 2.](#)

No  [Go to 6.](#)

2. CHECK DTC.



1. Turn the ignition switch to OFF.
2. Manually close PRG to the partially latched position, and operate the power rear gate auto closer to fully close. (PRG initialization)
3. Press the operation SW to perform auto-open/close of PRG, and then return to the full-close position.
4. Turn the ignition switch to ON.
5. Using the Subaru Select Monitor, read DTC of PRG CM. [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is B2513, B2515, B2516 or B2517 displayed? (Current malfunction)

Yes

[Go to 3.](#)

No

[Go to 6.](#)

3. CHECK DATA MONITOR.



Using Subaru Select Monitor, check [SECTOR SW], [COURTESY SW] and [LATCH SW]. [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)

Is each data displayed as follows, when PRG is at the full-close position?

- LATCH SW: OFF
- COURTESY SW: OFF
- SECTOR SW: ON

Yes

[Go to 4.](#)

No

[Go to 5.](#)

4. CHECK DATA MONITOR.



Using Subaru Select Monitor, check [CLOSER (OPEN)] and [CLOSER (CLOSE)]. [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)

Does each data change, when the auto-open/close operation is performed? (ON ↔ OFF)

Yes

[Go to 6.](#)

No

[Go to 5.](#)


No

5. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Disconnect the power rear gate auto closer connector.
4. Check for poor contact of connector.

Is the check result OK?

Yes

 [Go to 7.](#)

No

Repair or replace the poor contact of connector.

6. CHECK POWER REAR GATE AUTO CLOSER.

1. Disconnect the PRG CM connector.
2. Manually close the rear gate from the full-open position to the partially latched position.
3. Check the power rear gate auto closer operation.

Does the pull-in operation occur from the partially latched position?

Yes

Currently, the system is normal. A temporary poor contact may be a possible cause. Therefore, check the harness connector.

No

 [Go to 7.](#)

7. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the PRG CM connector.
2. Disconnect the power rear gate auto closer connector.
3. Measure the resistance between PRG CM connector and power rear gate auto closer connector.

Connector & terminal

(R422) No. 13 — (D153) No. 1:

(R422) No. 5 — (D153) No. 2:

(R423) No. 4 — (D153) No. 6:

(R423) No. 13 — (D153) No. 5:

(R423) No. 14 — (D153) No. 3:

Is the resistance 10 Ω or less?

Yes

 [Go to 8.](#)

No

Repair or replace the open circuit of harness.

8. CHECK HARNESS (GROUND SHORT CIRCUIT).



Measure the resistance between PRG CM connector and chassis ground, and between power rear gate auto closer connector and chassis ground.

Connector & terminal

(R422) No. 13 — Chassis ground:

(R422) No. 5 — Chassis ground:

(R423) No. 4 — Chassis ground:

(R423) No. 13 — Chassis ground:

(R423) No. 14 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 9.](#)

No

Repair or replace the short circuit of the harness.

9. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).



Measure the voltage between PRG CM connector and chassis ground.


Connector & terminal

(R422) No. 13 (+) — Chassis ground (-):

(R422) No. 5 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes

 [Go to 10.](#)

No

Repair or replace the short circuit of the harness.

10. CHECK HARNESS (OPEN CIRCUIT).




Measure the resistance between power rear gate auto closer connector and chassis ground.

Connector & terminal

(D153) No. 4 — Chassis ground:

Is the resistance less than 10 Ω?




Yes

 [Go to 11.](#)

No


Repair or replace the short circuit of the harness.

11. CHECK POWER REAR GATE AUTO CLOSER.


1. Connect the PRG CM connector.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)
2. Connect the PRG DU connector.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Drive Unit.](#)
3. Using Subaru Select Monitor, check [SECTOR SW], [COURTESY SW] and [LATCH SW].
 [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)
4. Fully open the rear gate, and operate each switch manually.

Does each data change when the switch is operated? (ON ↔ OFF)

Yes

 [Go to 12.](#)

No

Replace the power rear gate auto closer.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Auto Closer.](#)

12. CHECK POWER REAR GATE AUTO CLOSER.

Check the power rear gate auto closer operation, when battery voltage is applied directly to the power rear gate auto closer connector.


Terminals

(R422) No. 13 — positive terminal:


(R422) No. 5 — ground terminal:

Does the power rear gate auto closer operate?

Yes

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No

Replace the power rear gate auto closer.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Auto Closer.](#)

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2514 IGNITION

DTC detecting condition:

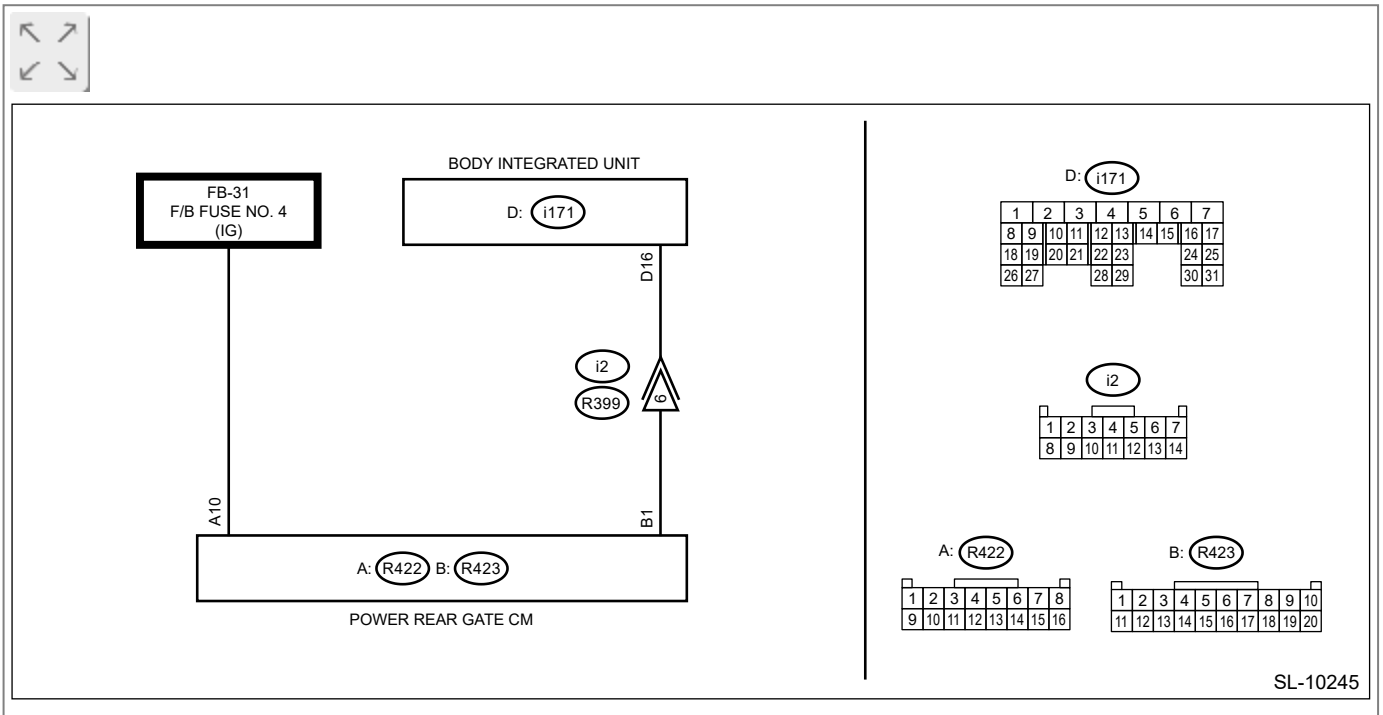
When the LIN communication signal and direct line signal do not match.

Trouble symptom:


PRG does not operate.

Wiring diagram:



Power rear gate system  [Ref. to WIRING SYSTEM>Power Rear Gate System>WIRING DIAGRAM.](#)




1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2514 displayed? (Current malfunction)


-  [Go to 2.](#)
-  [Go to 4.](#)

2. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Turn the ignition switch to ON.
3. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2514 displayed? (Current malfunction)


Yes

 [Go to 3.](#)

No


 [Go to 4.](#)

3. CHECK DATA MONITOR.


Using Subaru Select Monitor, check [Ignition Signal] and [IGN SW].  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)


When the ignition switch is turned to ON/OFF, are these two data synchronized?

Yes

 [Go to 4.](#)

No

When [Ignition Signal] is not synchronized:  [Go to 5.](#)

When [IGN SW] is not synchronized:  [Go to 9.](#)

4. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Check for poor contact of connector.

Is the check result OK?


Yes

Repair or replace the poor contact of connector.

No


A temporary change of voltage occurred.

5. CHECK DATA MONITOR.


Check the data monitor [Power Supply Voltage] of body integrated unit using Subaru Select Monitor.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Data Monitor.](#)

When the ignition switch is turned to ON/OFF, does the value change? (10 — 15 V when ON)

Yes

 [Go to 6.](#)

No

Check the body control.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

6. CHECK HARNESS (OPEN CIRCUIT).



1. Disconnect the PRG CM connector.
2. Disconnect the body integrated unit connector.
3. Measure the resistance between PRG CM connector and body integrated unit.

Connector & terminal

(R423) No. 1 — (i171) No. 16:

Is the resistance less than 10 Ω ?

Yes

 [Go to 7.](#)

No

Repair or replace the open circuit of harness.

7. CHECK HARNESS (GROUND SHORT CIRCUIT).



Measure the resistance between PRG CM connector and chassis ground.

Connector & terminal

(R423) No. 1 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 8.](#)

No

Repair or replace the short circuit of the harness.

8. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).




Measure the voltage between PRG CM connector and chassis ground.

Connector & terminal

(R423) No. 1 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes

 [Go to 9.](#)

No

Repair or replace the short circuit of the harness.

9. CHECK HARNESS (POWER SUPPLY CIRCUIT).




1. Turn the ignition switch to ON.
2. Measure the voltage between PRG CM connector and chassis ground.

Connector & terminal

(R422) No. 10 (+) — Chassis ground (-):

Is the voltage 10.5 V or more and less than 16 V?

Yes

 [Go to 10.](#)

No

Repair or replace the open circuit of harness.


10. CHECK CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Check for poor contact of connector.

Is the check result OK?

Yes

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)


No

Repair or replace the poor contact of connector.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2515 LATCH SW


Note:

For the diagnostic procedure, refer to DTC B2513.  Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2513 LATCH CONDITION.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2516 SECTOR SW


Note:

For the diagnostic procedure, refer to DTC B2513.  Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2513 LATCH CONDITION.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2517 COURTESY SW

Note:

For the diagnostic procedure, refer to DTC B2513.  Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2513 LATCH CONDITION.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)
DTC B2518 PRG CONTINUOUSLY-WORKING FAILURE

DTC detecting condition:

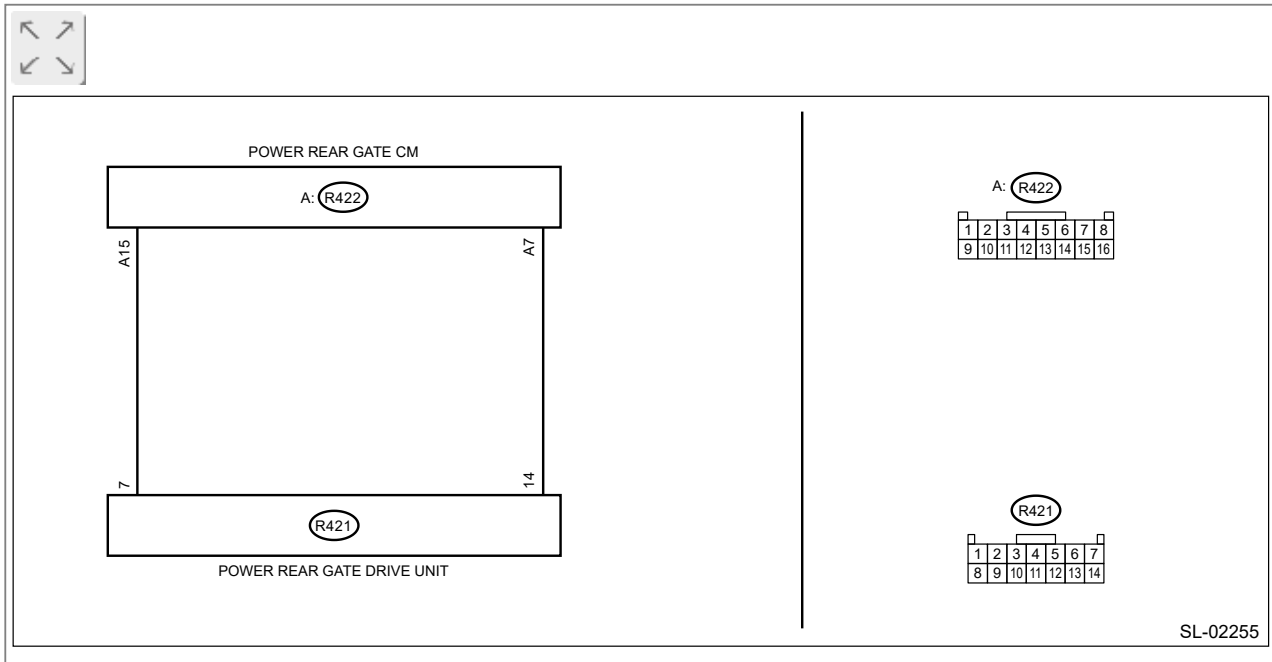
When the motor operation continued for 30 seconds or more.

Trouble symptom:

During the auto-operation, the door free condition occurs.


Wiring diagram:

Power rear gate system  [Ref. to WIRING SYSTEM>Power Rear Gate System>WIRING DIAGRAM.](#)




1. CHECK REAR GATE.

Is there any snow, ice or installed parts other than genuine parts on the rear gate?

- Remove any snow, ice or installed parts other than genuine parts.
-  [Go to 2.](#)


2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)


Is DTC B2518 displayed? (Current malfunction)

-  [Go to 4.](#)
-

No


 [Go to 3.](#)

3. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Fully close the rear gate.
3. Press the operation SW to perform auto-open/close of PRG, and then return to the full-close position.
4. Turn the ignition switch to ON.
5. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2518 displayed? (Current malfunction)

Yes

 [Go to 4.](#)

No

Currently, the system is normal. A temporary poor contact may be a possible cause. Therefore, check the harness connector.

4. CHECK REAR GATE.

Press and hold the opener button, and perform open/close operation manually.

Is abnormal weight detected compared to equivalent vehicles?

Yes

 [Go to 5.](#)

No

 [Go to 6.](#)

5. CHECK REAR GATE.


Check the rear gate appearance.

Is there distortion or rust on the hinge? (Is there any history of accidents?)

Yes

Repair the rear gate hinge.

No

Replace the damper.  [Ref. to EXTERIOR BODY PANELS>Rear Gate>REMOVAL > REAR GATE DAMPER STAY.](#)

6. CHECK PRG CM.

1. Perform auto-open/close of PRG.
2. Check the waveform using an oscilloscope.

Connector & terminal

(R422) No. 7 — (R422) No. 15:

Is the waveform OK?

At open: DUTY 40 — 70%


At close: DUTY 60 — 80% (However, the value decreases to 30% at the moment of closing)

For the waveform, refer to Note in the margin.

Yes

 [Go to 7.](#)

No

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

7. CHECK HARNESS (OPEN CIRCUIT).



1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector and PRG DU connector.
3. Using a tester, measure the resistance between the PRG CM connector and PRG DU connector.


Connector & terminal

(R422) No. 7 — (R421) No. 14:

(R422) No. 15 — (R421) No. 7:

Is the resistance less than 10 Ω?

Yes

Replace the PRG DU.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Drive Unit.](#)

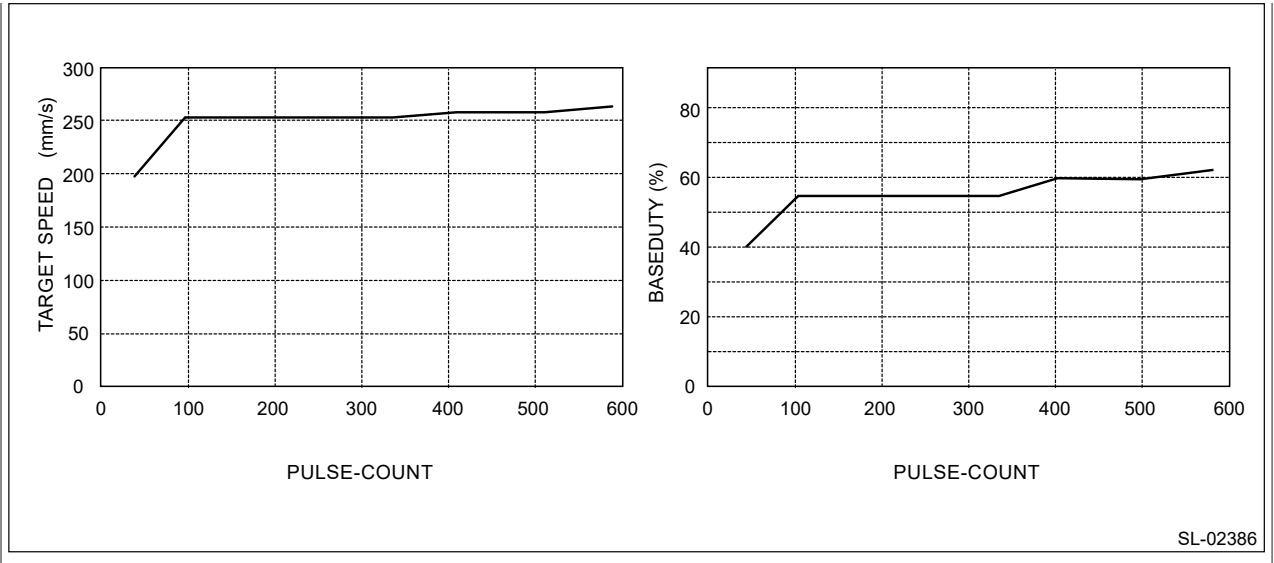
No

Repair or replace the open circuit of harness.

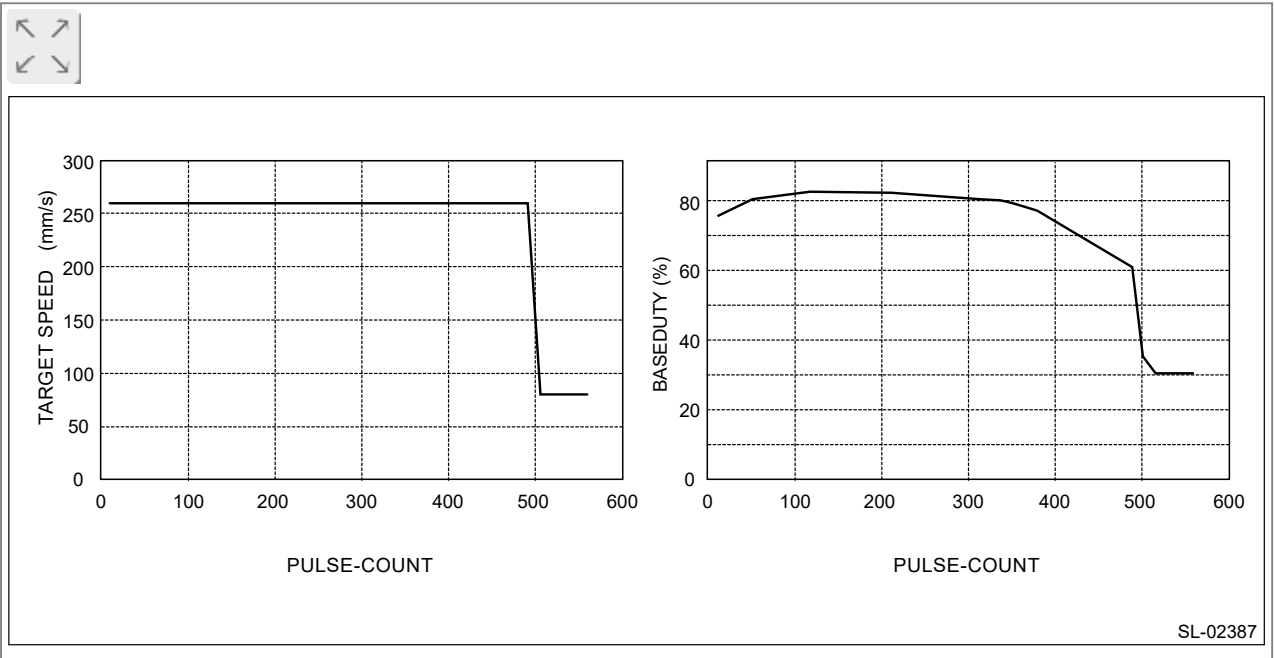
Note:

- Target speed at PRG open operation (left) DUTY (right)





• Target speed at PRG close operation (left) DUTY (right)



POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2519 POWER +B OPEN

DTC detecting condition:

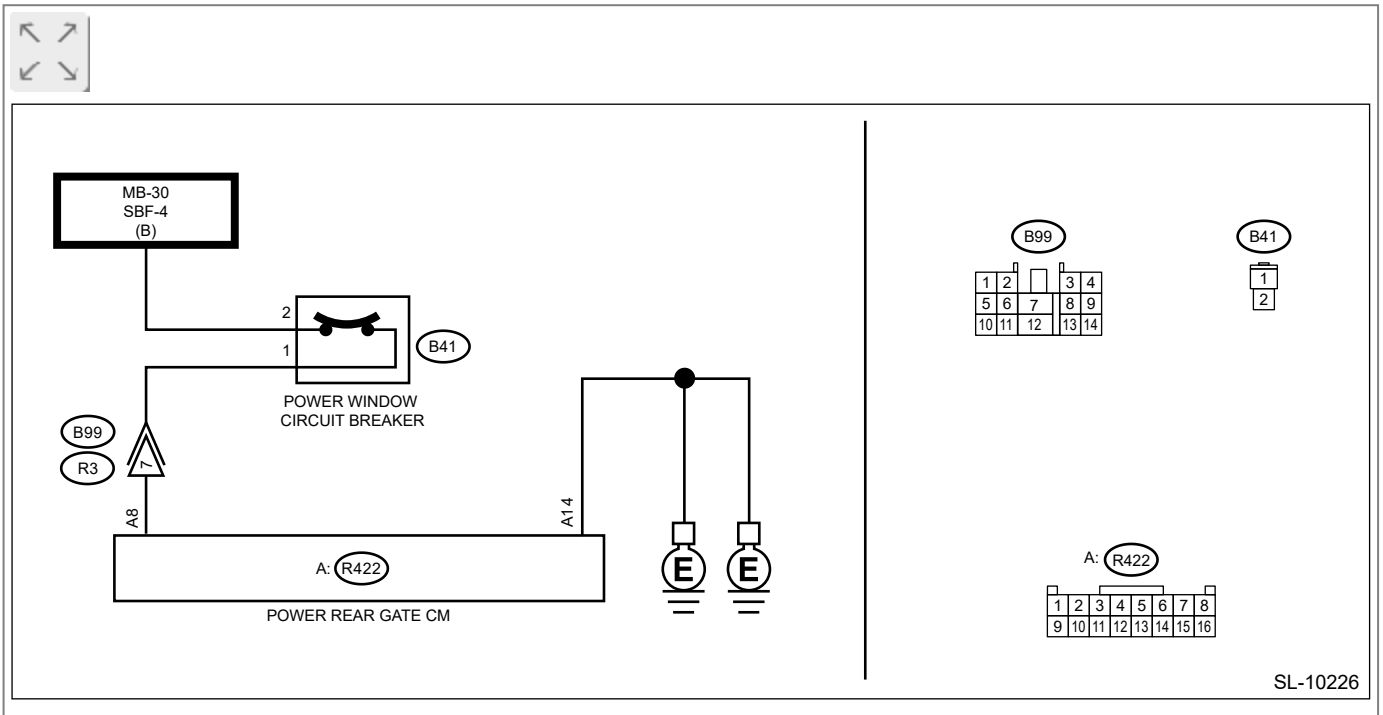
When power supply failure related to PRG CM power is detected.

Trouble symptom:


During the auto-operation, the door free, the auto-operation do not function.

Wiring diagram:



Power rear gate system  [Ref. to WIRING SYSTEM>Power Rear Gate System>WIRING DIAGRAM.](#)




1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2519 displayed? (Current malfunction)


-  [Go to 2.](#)
-  [Go to 4.](#)

2. CHECK DTC.


1. Turn the ignition switch to OFF.
2. Turn the ignition switch to ON.
3. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2519 displayed? (Current malfunction)


Yes

 [Go to 3.](#)

No


 [Go to 4.](#)

3. CHECK DATA MONITOR.


Using Subaru Select Monitor, check [+POWER B].  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)

Is the value less than 10.5 V or 16 V or more?

Yes

 [Go to 5.](#)

No

 [Go to 4.](#)

4. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Check for poor contact of connector.

Is the check result OK?


Yes

A temporary change of voltage occurred.

No


Repair or replace the poor contact of connector.

5. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse.  [Ref. to POWER REAR GATE SYSTEM>Relay and Fuse.](#)

Is the check result OK?

Yes

 [Go to 6.](#)

No

Replace the defective fuse. When the fuse is blown immediately, repair the short circuit.

6. CHECK HARNESS (POWER SUPPLY CIRCUIT).




1. Disconnect the PRG CM connector.
2. Using a tester, measure the voltage between the PRG CM connector and chassis ground.

Connector & terminal

(R422) No. 8 (+) — Chassis ground (-):

Is the voltage less than 10.5 V or less than 16 V?

Yes

 [Go to 7.](#)

No

Repair or replace the open circuit of harness.

7. CHECK HARNESS (OPEN CIRCUIT).



Using a tester, measure the resistance between the PRG CM connector and chassis ground.

Connector & terminal

(R422) No. 14 — Chassis ground:

Is the resistance less than 10 Ω ?

Yes

 [Go to 8.](#)

No

Repair or replace the open circuit of harness.


8. CHECK CONNECTOR.



Check for poor contact of connector.

Is the check result OK?

Yes

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No

Repair or replace the poor contact of connector.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B251A LIN CONNECTION NO-RECEIVE DATA

DTC detecting condition:

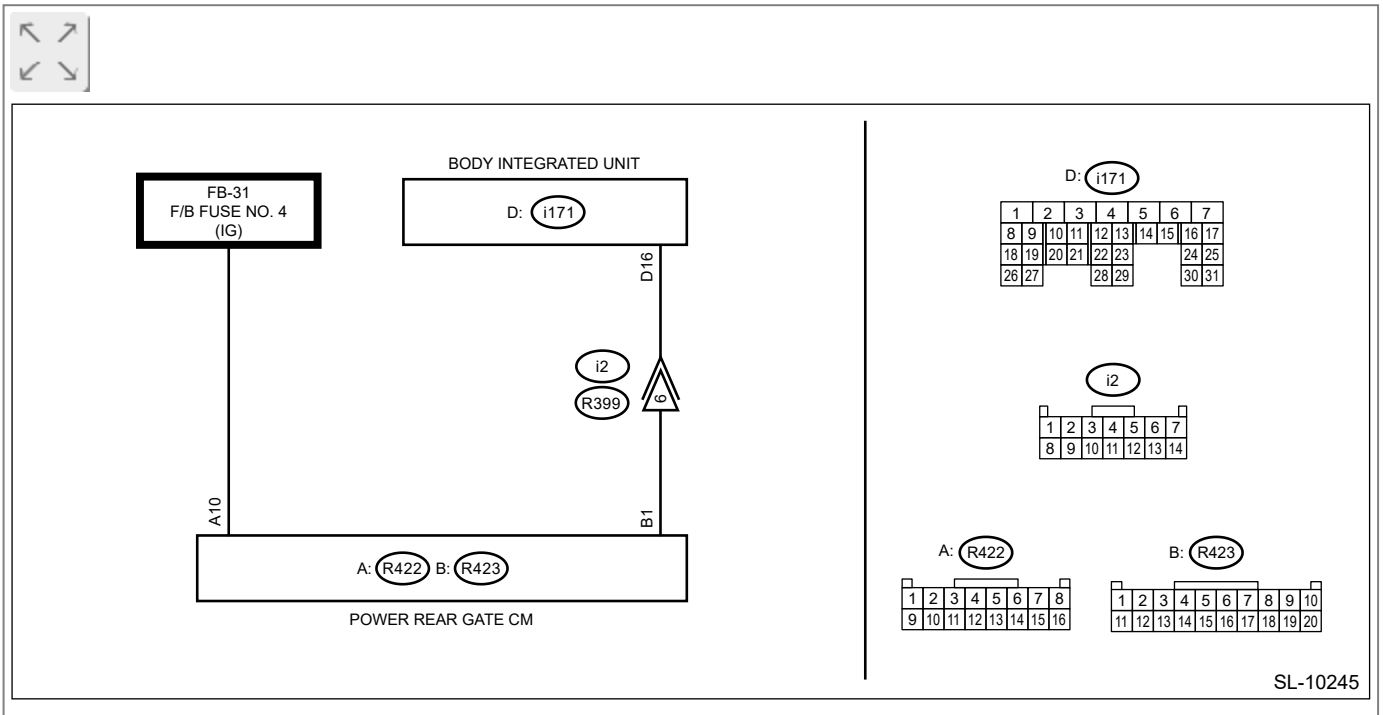
When LIN communication failure is detected.

Trouble symptom:


The auto-operation does not function, and reverse operation occurs during the auto-open operation.

Wiring diagram:



Power rear gate system  [Ref. to WIRING SYSTEM>Power Rear Gate System>WIRING DIAGRAM.](#)




1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is B251A, B251B or B251D displayed? (Current malfunction)


-  [Go to 2.](#)
-  [Go to 3.](#)

2. CHECK DTC.


1. Turn the ignition switch to OFF.
2. Turn the ignition switch to ON.
3. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is B251A, B251B or B251D displayed? (Current malfunction)

Yes

 [Go to 4.](#)

No

 [Go to 3.](#)

3. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Check for poor contact of connector.

Is the check result OK?


Yes

Temporary communication failure occurred.

No


Repair or replace the poor contact of connector.

4. CHECK INTEGRATED UNIT.

Read the DTC of body integrated unit using Subaru Select Monitor.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes

Perform the diagnosis for the displayed DTCs.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 5.](#)

5. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Disconnect the body integrated unit connector.


4. Measure the resistance between PRG CM connector and body integrated unit.

Connector & terminal

(R423) No. 1 — (i171) No. 16:

Is the resistance less than 10 Ω ?

Yes

 [Go to 6.](#)

No

Repair or replace the open circuit of harness.

6. CHECK HARNESS (GROUND SHORT CIRCUIT).




Measure the resistance between PRG CM connector and chassis ground.

Connector & terminal

(R423) No. 1 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 7.](#)

No

Repair or replace the short circuit of the harness.

7. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).




Measure the voltage between PRG CM connector and chassis ground.

Connector & terminal

(R423) No. 1 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes

 [Go to 8.](#)

No

Repair or replace the short circuit of the harness.

8. CHECK HARNESS (POWER SUPPLY CIRCUIT).



1. Turn the ignition switch to ON.


2. Measure the voltage between PRG CM connector and chassis ground.

Connector & terminal

(R422) No. 10 (+) — Chassis ground (-):

Is the voltage 10.5 V or more and less than 16 V?

Yes

 [Go to 9.](#)

No

Repair or replace the open circuit of harness.


9. CHECK CONNECTOR.



1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Check for poor contact of connector.

Is the check result OK?

Yes

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)


No

Repair or replace the poor contact of connector.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B251B LIN CONNECTION BUS PHYSICAL


Note:

For the diagnostic procedure, refer to DTC B251A.  Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B251A LIN CONNECTION NO-RECEIVE DATA.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B251D AT/MT JUDGMENT FAILURE

Note:

For the diagnostic procedure, refer to DTC B251A.  Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B251A LIN CONNECTION NO-RECEIVE DATA.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2522 EEPROM


DTC detecting condition:

When failure in PRG CM is detected.

Trouble symptom:


The memorized half-stop position is reset, and returned to the default setting.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2522 displayed? (Current malfunction)


Yes

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No


 [Go to 2.](#)

2. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Turn the ignition switch to ON.
3. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2522 displayed? (Current malfunction)

Yes

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No

Currently, the system is normal. A temporary poor contact may be a possible cause. Therefore, check the harness connector.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2523 HALF STOP SOLENOID FAILURE

DTC detecting condition:

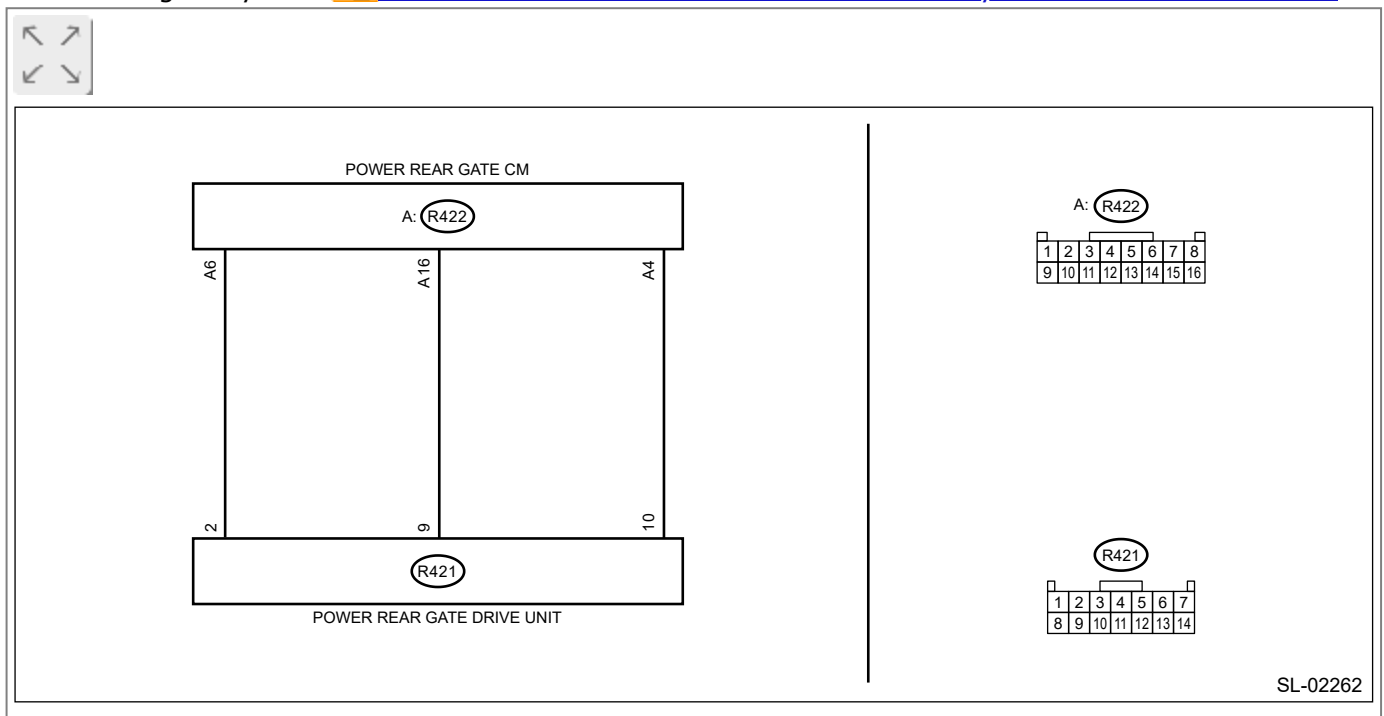
When malfunction in the keep solenoid is detected.

Trouble symptom:


Half-stop is not possible.

Wiring diagram:


Power rear gate system  [Ref. to WIRING SYSTEM>Power Rear Gate System>WIRING DIAGRAM.](#)




1. CHECK DTC.


1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2523 displayed? (Current malfunction)

 [Go to 2.](#)


 [Go to 3.](#)

2. CHECK DTC.


1. Turn the ignition switch to OFF.
2. Turn the ignition switch to ON.
3. Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2523 displayed? (Current malfunction)

Yes

 [Go to 4.](#)

No

 [Go to 3.](#)

3. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Check for poor contact of connector.

Is the check result OK?

Yes

A temporary change of voltage occurred.

No

Repair or replace the poor contact of connector.

4. CHECK HARNESS (POWER SUPPLY CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Measure the voltage between PRG CM connector and chassis ground.

Connector & terminal


(R422) No. 6 (+) — Chassis ground (-):

Is the voltage 10.5 V or more and less than 16 V?

Yes

 [Go to 5.](#)

No

Refer to step 4 and subsequent procedures for DTC B2500, and check the power supply circuit.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2500 BATTERY POWER SUPPLY.](#)

5. CHECK DATA MONITOR.



1. Connect the PRG CM connector.
2. Using Subaru Select Monitor, check [HALF STOP SOL (Lock)], [HALF STOP SOL (Cancel)] and [HALF STOP SOL POS SW]. [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)
3. During the auto-open operation, tap any of the keyless rear gate SW, PRG driver's SW, PRG opener button, or PRG inner SW to stop the operation in a half-way position. Tap SW again to operate the auto-close, and then check the data.

Caution:

ON output for lock and cancellation requires extremely short time (approx. 0.4 seconds). To check, limit the number of the display items on the Subaru Select Monitor to three. When the display items are too many, changes in the output signals will not be reflected.

Are the following changes detected?

- At R/G stop
Solenoid lock output, OFF → ON → OFF
Solenoid position detection SW, OFF → ON
- At R/G re-operation
Solenoid cancellation output, OFF → ON → OFF
Solenoid position detection SW, ON → OFF

Yes

[Go to 6.](#)

No

Replace the PRG CM. [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

6. CHECK HARNESS (OPEN CIRCUIT).



1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Disconnect the PRG DU connector.
4. Measure the resistance between PRG CM connector and PRG DU.

Connector & terminal

(R422) No. 16 — (R421) No. 9:

(R422) No. 4 — (R421) No. 10:

(R422) No. 6 — (R421) No. 2:

Is the resistance less than 10 Ω?

Yes

[Go to 7.](#)

No

Repair or replace the open circuit of harness.

7. CHECK HARNESS (GROUND SHORT CIRCUIT).



Measure the resistance between PRG CM connector and chassis ground.

Connector & terminal


(R422) No. 16 — Chassis ground:

(R422) No. 4 — Chassis ground:

(R422) No. 6 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 8.](#)

No

Repair or replace the short circuit of the harness.

8. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).



Measure the voltage between PRG CM connector and chassis ground.

Connector & terminal


(R422) No. 16 (+) — Chassis ground (-):

(R422) No. 4 (+) — Chassis ground (-):

(R422) No. 6 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes

 [Go to 9.](#)

No

Repair or replace the short circuit of the harness.

9. CHECK PRG DU.



1. Connect the PRG DU connector only.
2. Measure the resistance between PRG CM connectors.

Connector & terminal


(R422) No. 16 — (R422) No. 6:

(R422) No. 4 — (R422) No. 6:


Is the resistance less than 10 Ω?



Yes

 [Go to 10.](#)

No


Replace the PRG DU.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Drive Unit.](#)

10. CHECK CONNECTOR.

1. Disconnect the PRG CM connector.
2. Disconnect the PRG DU connector.
3. Check for poor contact of connector.

Is the check result OK?

Yes

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No


Repair or replace the poor contact of connector.

POWER REAR GATE(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Power Rear Gate], and then select [Enter].
5. On [Select Function] display, select [DTC].

Note:

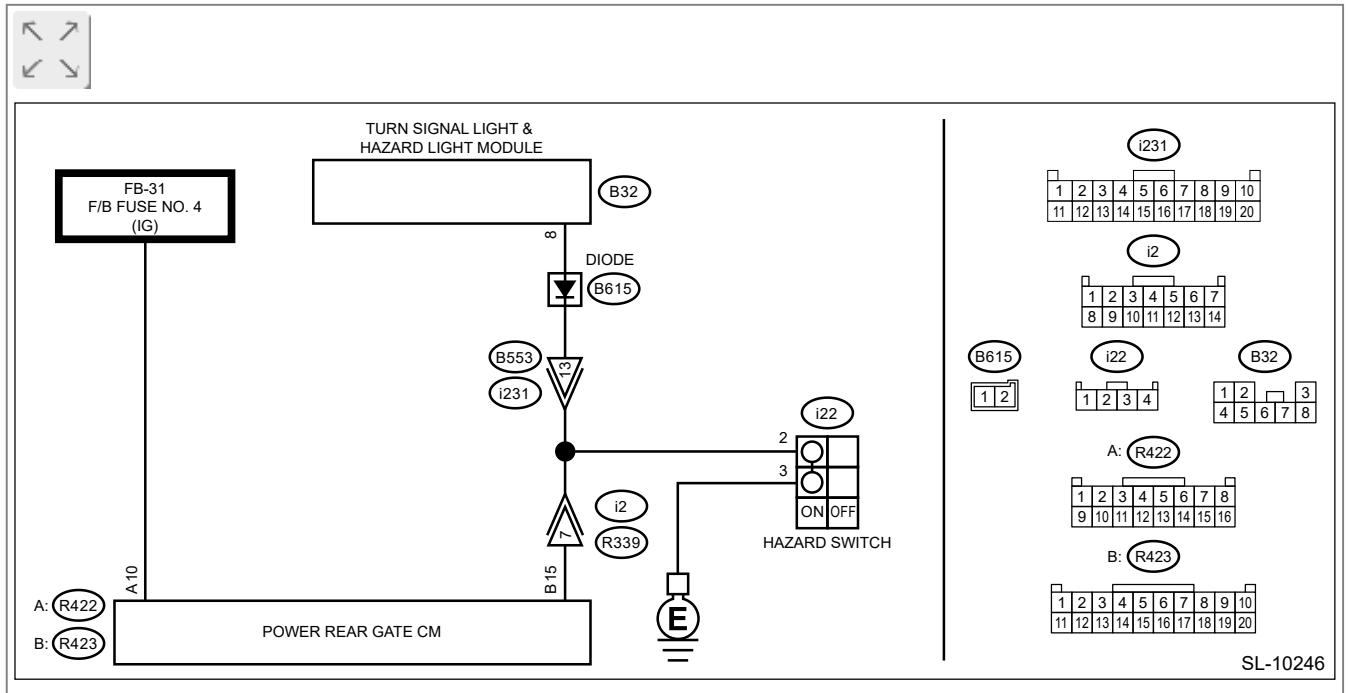
- For detailed operation procedures, refer to “Application help”.
 - For details concerning DTC, refer to “List of Diagnostic Trouble Code (DTC)”.
-  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

INSPECTION

1. TURN HAZARD LIGHTS DO NOT ILLUMINATE

Wiring diagram:

Power rear gate system [Ref. to WIRING SYSTEM>Power Rear Gate System>WIRING DIAGRAM.](#)



1. CHECK DATA MONITOR.

Using Subaru Select Monitor, check [IGN SW]. [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)

Does the data value change according to the ignition switch ON/OFF? (ON ↔ OFF)

- Yes [Go to 4.](#)
- No [Go to 2.](#)

2. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse. [Ref. to POWER REAR GATE SYSTEM>Relay and Fuse.](#)

Is the check result OK?

Yes

 [Go to 3.](#)

No

Replace the defective fuse. When the fuse is blown immediately, repair the short circuit.

3. CHECK HARNESS (POWER SUPPLY CIRCUIT).



1. Disconnect the PRG CM connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between PRG CM connector and chassis ground.

Connector & terminal

(R422) No. 10 (+) — Chassis ground (-):

Is the voltage 10.5 V or more when the ignition switch is ON?

Yes



 [Go to 4.](#)

No

Repair or replace the open circuit of harness.

4. CHECK DATA MONITOR.




1. Turn the ignition switch to OFF.
2. Connect the PRG CM connector.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)
3. Using Subaru Select Monitor, check [HAZARD].  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)
4. Operate the power rear gate to open.

Is the change of ON ↔ OFF detected?

Yes

 [Go to 5.](#)

No

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

5. CHECK HAZARD SWITCH.




1. Turn the hazard switch to ON.
2. Check that the hazard light blinks.

Does the hazard light blink?

Yes

 [Go to 6.](#)

No

Replace the turn signal light & hazard light unit.  [Ref. to POWER REAR GATE SYSTEM>Turn Signal Light & Hazard Light Unit.](#)

6. CHECK HARNESS (OPEN CIRCUIT).



1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Disconnect the turn signal & hazard unit connector.
4. Disconnect the hazard switch connector.
5. Measure the resistance between PRG CM connector and turn signal light & hazard light unit, and hazard switch connector.

Connector & terminal

(R423) No. 15 — (B32) No. 8:

(B32) No. 8 — (i22) No. 2:

Is the resistance less than 10 Ω ?

Yes

 [Go to 7.](#)

No

Repair or replace the open circuit of harness.

7. CHECK HARNESS (GROUND SHORT CIRCUIT).



Measure the resistance between PRG CM connector and chassis ground.

Connector & terminal

(R423) No. 15 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 8.](#)

No

Repair or replace the short circuit of the harness.

8. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).




Measure the voltage between PRG CM connector and chassis ground.

Connector & terminal

(R423) No. 15 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes

 [Go to 9.](#)

No

Repair or replace the short circuit of the harness.

9. CHECK CONNECTOR.

Check for poor contact of connector.

Is the check result OK?

Yes

A temporary change of voltage occurred.

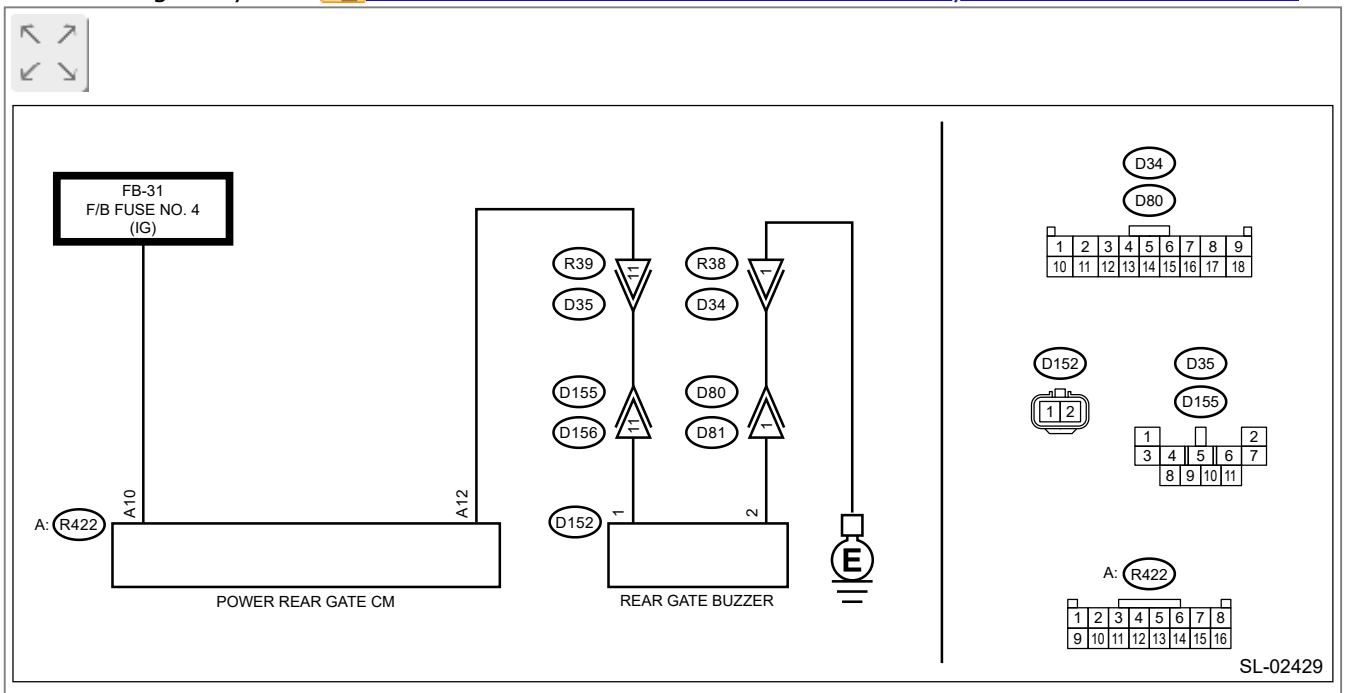
No

Repair or replace the connector.


2. THE BUZZER DOES NOT SOUND

Wiring diagram:

Power rear gate system  [Ref. to WIRING SYSTEM>Power Rear Gate System>WIRING DIAGRAM.](#)




1. CHECK DATA MONITOR.

Using Subaru Select Monitor, check [IGN SW].  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)

Does the data value change according to the ignition switch ON/OFF? (ON ↔ OFF)


Yes

 [Go to 4.](#)

No

 [Go to 2.](#)

2. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse.  [Ref. to POWER REAR GATE SYSTEM>Relay and Fuse.](#)

Is the check result OK?

Yes

 [Go to 3.](#)

No

Replace the defective fuse. When the fuse is blown immediately, repair the short circuit.

3. CHECK HARNESS (POWER SUPPLY CIRCUIT).

1. Disconnect the PRG CM connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between PRG CM connector and chassis ground.

Connector & terminal

(R422) No. 10 (+) — Chassis ground (—):

Is the voltage 10 V or more and less than 16 V, when the ignition switch is ON?


Yes

 [Go to 4.](#)

No

Repair or replace the open circuit of harness.


4. CHECK FUNCTION.

1. Connect the PRG CM connector.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)
2. Turn the ignition switch to ON.
3. Fully close PRG.
4. Turn the memory height SW to OFF.
5. Perform the auto-open operation of PRG.
6. Reverse PRG three times during the auto-open operation so that the door free condition

can be achieved.

Does the buzzer sound, when PRG operation starts, or when the door free condition is achieved?


Yes

If the buzzer sounds when operation starts, the system is normal. If the buzzer sounds when the door free condition is achieved,  [Go to 5.](#)

No

 [Go to 6.](#)

5. CHECK DATA MONITOR.

Using Subaru Select Monitor, check [Answer-Back Buzzer Information].  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)

Is the data value displayed as OFF?


Yes

Currently, the system is normal. A temporary poor contact may be a possible cause. Therefore, check the harness connector.

No

 [Go to 6.](#)

6. CHECK DATA MONITOR.

1. Using Subaru Select Monitor, check [BUZZER].  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)

2. Fully close the rear gate.


3. Operate PRG to open.

Is the change of ON \longleftrightarrow OFF detected during the auto-open operation?

Yes

 [Go to 7.](#)

No

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

7. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the PRG CM connector.

2. Disconnect the buzzer connector.


3. Measure the resistance between PRG CM connector and buzzer connector.

Connector & terminal

(R422) No. 12 — (D152) No. 1:

Is the resistance less than 10 Ω ?

Yes

 [Go to 8.](#)

No

Repair or replace the open circuit of harness.

8. CHECK HARNESS (GROUND SHORT CIRCUIT).

Measure the resistance between PRG CM connector and chassis ground.

Connector & terminal

(R422) No. 12 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 9.](#)

No

Repair or replace the short circuit of the harness.

9. CHECK HARNESS (OPEN CIRCUIT).


Measure the resistance between PRG CM connector and chassis ground.

Connector & terminal

(D152) No. 2 — Chassis ground:

Is the resistance less than 10 Ω ?

Yes

 [Go to 10.](#)

No

Repair or replace the open circuit of harness.

10. CHECK PRG CM.

1. Connect the PRG CM connector only.
2. Perform the step 4 operation.
3. Measure the voltage between the buzzer connector and chassis ground.

Connector & terminal

(D152) No. 1 (+) — Chassis ground (-):

Is the following change measured, when PRG operation starts, or when the door free condition is achieved?

Voltage: 10.5 V or more, less than 16 V

DUTY: 50%

Yes

Replace the buzzer. [🔗 Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Buzzer.](#)

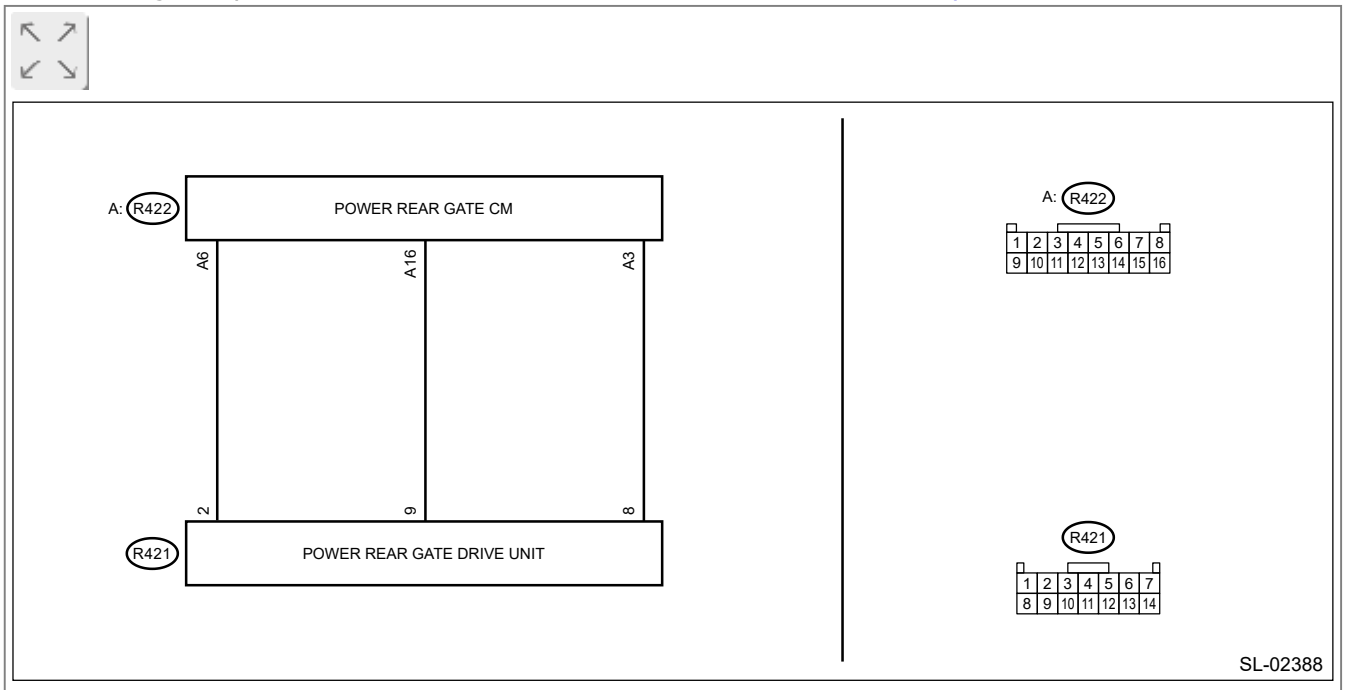
No

Replace the PRG CM. [🔗 Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

3. HALF-STOP CANNOT BE CANCELLED

Wiring diagram:

Power rear gate system [🔗 Ref. to WIRING SYSTEM>Power Rear Gate System>WIRING DIAGRAM.](#)



1. CHECK OPERATION SW.

Refer to "CHECK PRG DRIVER'S SW INPUT CIRCUIT", "CHECK PRG INNER SW INPUT CIRCUIT" and "OPERATION FROM KEYLESS/SMART MOBILE KEY IS NOT POSSIBLE" in "Diagnostics with Phenomenon", and check each operation SW. [🔗 Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > CHECK PRG DRIVER'S SW INPUT CIRCUIT.](#) [🔗 Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > CHECK PRG INNER SW INPUT CIRCUIT.](#) [🔗 Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > OPERATION FROM KEYLESS/SMART MOBILE KEY IS NOT POSSIBLE.](#)

Is the check result OK?


Yes

 [Go to 2.](#)

No

Perform the repair according to each diagnosis.

2. CHECK DATA MONITOR.

Using Subaru Select Monitor, check [HALF STOP SOL (Cancel)].  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)

Caution:

ON output for solenoid cancellation requires extremely short time (approx. 0.4 seconds). To check, limit the number of the display items on the Subaru Select Monitor to three. When the display items are too many, changes in the output signals will not be reflected.


Is the following output displayed, when PRG close-operation is performed with the operation SW?

"OFF → ON → OFF"

Yes

 [Go to 3.](#)

No

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

3. CHECK PRG CM.

Measure the voltage between PRG CM connector and chassis ground.

Connector & terminal


(R422) No. 6 (+) — Chassis ground (-):

Is the voltage 10.5 V or more and less than 16 V?

Yes

 [Go to 4.](#)

No

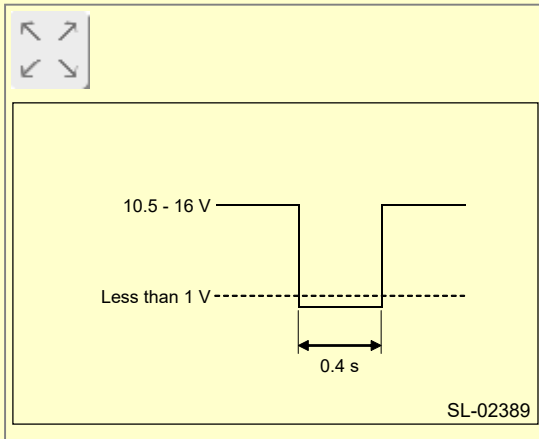
Refer to step 4 and subsequent procedures for DTC B2500, and check the power supply circuit.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2500 BATTERY POWER SUPPLY.](#)

4. CHECK PRG CM.

Measure the voltage between PRG CM connector and chassis ground, using an oscilloscope.

Connector & terminal

(R422) No. 4 (+) — Chassis ground (-):



Is the voltage less than 1 V for 0.4 seconds, when PRG close-operation is performed with the operation SW? (Reference: Waveform shown on the left)

Yes

[Go to 5.](#)

No

Replace the PRG CM. [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

5. CHECK PRG CM.

Measure the voltage between PRG CM connector and chassis ground.

Connector & terminal

(R422) No. 16 — Chassis ground:

Is it less than 1 V?

Yes

Replace the PRG CM. [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No

[Go to 6.](#)

6. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the PRG CM connector.
2. Disconnect the PRG DU connector.
3. Measure the resistance between PRG CM connector and PRG DU connector.

Connector & terminal

(R422) No. 6 — (R421) No. 2:

(R422) No. 4 — (R421) No. 9:

Is the resistance less than 10 Ω ?

Yes

 [Go to 7.](#)

No

Repair or replace the open circuit of harness.

7. CHECK HARNESS (GROUND SHORT CIRCUIT).



Measure the resistance between PRG CM connector and chassis ground.

Connector & terminal

(R422) No. 6 — Chassis ground:

(R422) No. 16 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 8.](#)

No

Repair or replace the short circuit of the harness.

8. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).



Measure the voltage between PRG CM connector and chassis ground.

Connector & terminal

(R422) No. 4 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes

 [Go to 9.](#)

No

Repair or replace the short circuit of the harness.


9. CHECK CONNECTOR.



1. Turn the ignition switch to OFF.
2. Check for poor contact of connector.

Is the check result OK?

Yes

Replace the PRG DU.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Drive Unit.](#)

No


Repair or replace the poor contact of connector.

4. OPERATION BY THE PRG DRIVER'S SW IS NOT POSSIBLE

Note:


Before performing diagnosis, initialize PRG SYS by opening PRG in manual operation, and then operating the power rear gate auto closer from the partially latched state.

1. CHECK DTC.

Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed? (Current malfunction)


Yes

Perform the diagnosis for the displayed DTCs.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 2.](#)

2. CHECK DATA MONITOR.


Using Subaru Select Monitor, check [D SW].  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)

Does the display switch between OFF ↔ ON according to PRG driver's SW operation?


Yes

 [Go to 4.](#)

No

 [Go to 3.](#)

3. CHECK PRG DRIVER'S SW INPUT CIRCUIT.

Refer to "CHECK PRG DRIVER'S SW INPUT CIRCUIT", and check the PRG driver's SW.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION >CHECK PRG DRIVER'S SW INPUT CIRCUIT.](#)

Is the check result OK?

Yes

 [Go to 4.](#)

No

Repair according to "CHECK PRG DRIVER'S SW INPUT CIRCUIT".

4. CHECK POWER REAR GATE AUTO CLOSER.



Refer to step 3 and subsequent procedures for DTC B2513, and check the power rear gate auto closer. [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2513 LATCH CONDITION.](#)

Is the check result OK?

Yes

[Go to 5.](#)

No

Repair it according to B2513 diagnosis.

5. CHECK SOLENOID.



Refer to step 4 and subsequent procedures for DTC B2523, and check the solenoid. [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2523 HALF STOP SOLENOID FAILURE.](#)

Is the check result OK?

Yes

[Go to 6.](#)

No

Repair it according to B2523 diagnosis.

6. CHECK CLUTCH.



Refer to step 4 and subsequent procedures for DTC B2509, and check the clutch. [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2509 CLUTCH OPEN.](#)

Is the check result OK?

Yes

[Go to 7.](#)

No

Repair it according to B2509 diagnosis.

7. CHECK PRG MOTOR OPEN CIRCUIT.




Perform step 4 and subsequent procedures for DTC B2507, and check the PRG motor open circuit. [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic](#)

[Trouble Code \(DTC\)>DTC B2507 PRG MOTOR CIRCUIT OPEN.](#)

Is the check result OK?

Yes


 [Go to 8.](#)

No

Repair it according to B2507 diagnosis.

8. CHECK PRG MOTOR SHORT.



Perform step 4 and subsequent procedures for DTC B2508, and check the PRG motor short circuit.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2508 PRG MOTOR CIRCUIT LOW.](#)

Is the check result OK?

Yes


 [Go to 9.](#)

No

Repair it according to B2508 diagnosis.


9. CHECK ROTATION SENSOR.



Perform step 4 and subsequent procedures for DTC B250B, and check the rotation sensor.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B250B ROTATION SENSOR A STUCK.](#)

Is the check result OK?

Yes


 [Go to 10.](#)

No

Repair it according to B250B diagnosis.


10. CHECK TOUCH SENSOR.



Perform step 3 and subsequent procedures for DTC B250A, and check the touch sensor.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B250A TOUCH SENSORS BATT. GND SHORT OUT.](#)

Is the check result OK?

Yes

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No

Repair it according to B250A diagnosis.

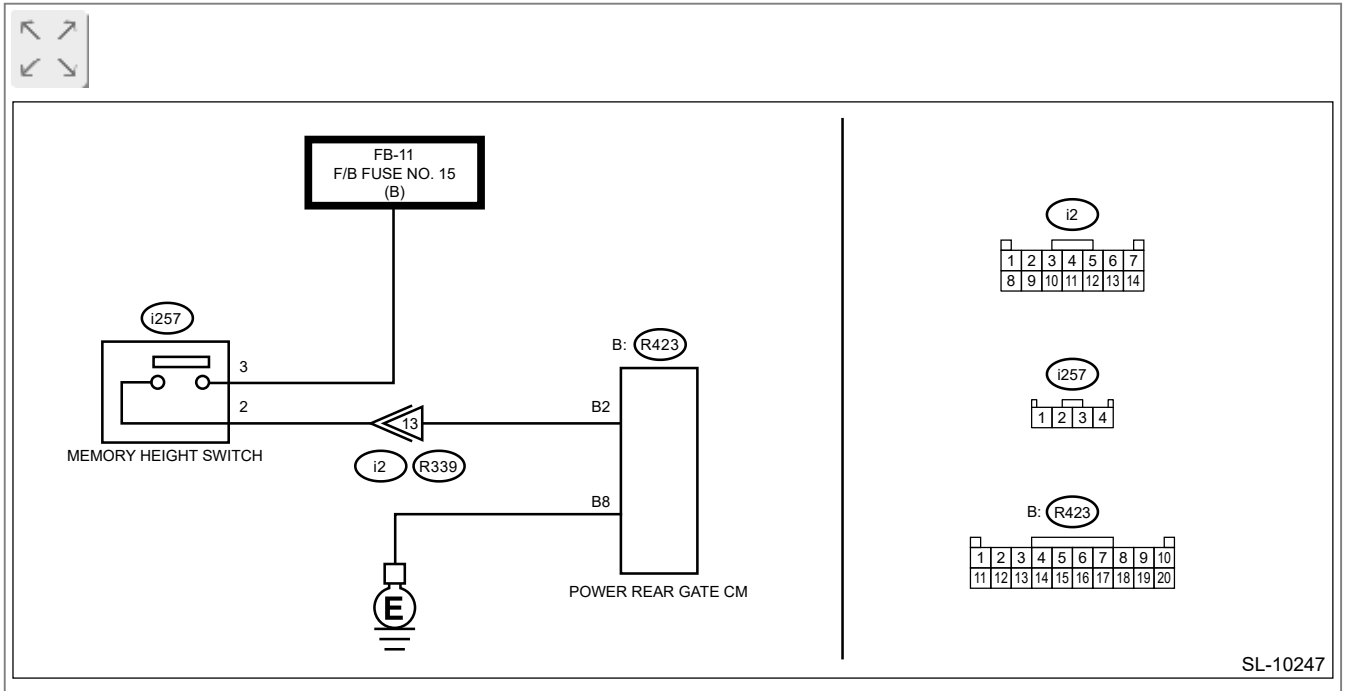
5. CHECK MEMORY HEIGHT SWITCH INPUT CIRCUIT

Note:

Before performing diagnosis, initialize PRG SYS by opening PRG in manual operation, and then operating the power rear gate auto closer from the partially latched state.

Wiring diagram:

Power rear gate system  [Ref. to WIRING SYSTEM>Power Rear Gate System>WIRING DIAGRAM.](#)



1. CHECK BACK-UP FUSE.

Check the fuse.  [Ref. to POWER REAR GATE SYSTEM>Relay and Fuse.](#)

Is the check result OK?


Yes

 [Go to 2.](#)

No

Replace the fuse.

2. CHECK DATA MONITOR.


Using Subaru Select Monitor, check [Memory stop SW].  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)

Does the display switch between OFF ↔ ON according to memory height SW operation?

Yes

Input circuit is normal.

No

 [Go to 3.](#)

3. CHECK HARNESS (OPEN CIRCUIT).




1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Disconnect the memory height SW connector.
4. Turn the ignition switch to ON.
5. Measure the resistance between PRG CM connector and memory height SW connector.

Connector & terminal

(R423) No. 2 — (i257) No. 2:

Is the resistance less than 10 Ω?

Yes

 [Go to 4.](#)

No

Repair or replace the open circuit of harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).



Measure the resistance between PRG CM connector and chassis ground.

Connector & terminal

(R423) No. 2 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 5.](#)

No

Repair or replace the short circuit of the harness.

5. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).



Measure the voltage between PRG CM connector and chassis ground.

Connector & terminal

(R423) No. 2 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes

 [Go to 6.](#)

No

Repair or replace the short circuit of the harness.

6. CHECK HARNESS (POWER SUPPLY CIRCUIT).



Measure the voltage between memory height SW connector and chassis ground.

Connector & terminal

(i257) No. 3 (+) — Chassis ground (-):

Is the voltage 10.5 V or more and less than 16 V?

Yes

 [Go to 7.](#)

No

Repair or replace the open circuit of harness.

7. CHECK HARNESS (OPEN CIRCUIT).



Measure the resistance between PRG CM connector and chassis ground.

Connector & terminal

(R423) No. 8 — Chassis ground:

Is the resistance less than 10 Ω ?

Yes

 [Go to 8.](#)

No

Repair or replace the open circuit of harness.

8. CHECK MEMORY HEIGHT SW UNIT.



Measure the memory height switch resistance.

Terminals

No. 2 —No. 3:

Is the resistance 1 M Ω or more at OFF, and less than 1 Ω at ON?

Yes

 [Go to 9.](#)

No

Replace the memory height SW.  [Ref. to POWER REAR GATE SYSTEM>Memory Height Switch.](#)

9. CHECK CONNECTOR.

Check for poor contact of connector.

Is the check result OK?

Yes

Replace the PRG CM. [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No

Repair or replace the poor contact of connector.

6. PRG INNER SW DOES NOT FUNCTION

Note:

Before performing diagnosis, initialize PRG SYS by opening PRG in manual operation, and then operating the power rear gate auto closer from the partially latched state.

1. CHECK DTC.

Using the Subaru Select Monitor, read DTC of PRG CM. [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed? (Current malfunction)

Yes

Perform the diagnosis for the displayed DTCs. [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 2.](#)

2. CHECK DATA MONITOR.

Using Subaru Select Monitor, check [R/G inner SW]. [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)

Does the display switch between OFF ↔ ON according to PRG inner SW operation?


Yes

[Go to 4.](#)

No

[Go to 3.](#)

3. CHECK PRG INNER SW INPUT CIRCUIT.

Refer to "CHECK PRG INNER SW INPUT CIRCUIT", and check the PRG inner SW.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > CHECK PRG INNER SW INPUT CIRCUIT.](#)

Is the check result OK?


Yes

 [Go to 4.](#)

No

Repair according to "CHECK PRG INNER SW INPUT CIRCUIT".

4. CHECK POWER REAR GATE AUTO CLOSER.

Refer to step 3 and subsequent procedures for DTC B2513, and check the power rear gate auto closer.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2513 LATCH CONDITION.](#)

Is the check result OK?


Yes

 [Go to 5.](#)

No

Repair it according to B2513 diagnosis.

5. CHECK SOLENOID.

Refer to step 4 and subsequent procedures for DTC B2523, and check the solenoid.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2523 HALF STOP SOLENOID FAILURE.](#)

Is the check result OK?


Yes

 [Go to 6.](#)

No

Repair it according to B2523 diagnosis.

6. CHECK CLUTCH.

Refer to step 4 and subsequent procedures for DTC B2509, and check the clutch.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2509 CLUTCH OPEN.](#)

Is the check result OK?


Yes

 [Go to 7.](#)

No

Repair it according to B2509 diagnosis.

7. CHECK PRG MOTOR OPEN CIRCUIT.

Perform step 4 and subsequent procedures for DTC B2507, and check the PRG motor open circuit.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2507 PRG MOTOR CIRCUIT OPEN.](#)

Is the check result OK?


Yes

 [Go to 8.](#)

No

Repair it according to B2507 diagnosis.

8. CHECK PRG MOTOR SHORT.

Perform step 4 and subsequent procedures for DTC B2508, and check the PRG motor short circuit.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2508 PRG MOTOR CIRCUIT LOW.](#)

Is the check result OK?


Yes

 [Go to 9.](#)

No


Repair it according to B2508 diagnosis.

9. CHECK ROTATION SENSOR.

Perform step 4 and subsequent procedures for DTC B250B, and check the rotation sensor.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B250B ROTATION SENSOR A STUCK.](#)

Is the check result OK?

Yes

 [Go to 10.](#)

No

Repair it according to B250B diagnosis.

10. CHECK TOUCH SENSOR.



Perform step 3 and subsequent procedures for DTC B250A, and check the touch sensor. [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B250A TOUCH SENSORS BATT. GND SHORT OUT.](#)

Is the check result OK?

Yes

Replace the PRG CM. [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No

Repair it according to B250A diagnosis.

7. PRG POSITION CANNOT BE MEMORIZED

Note:

Before performing diagnosis, initialize PRG SYS by opening PRG in manual operation, and then operating the power rear gate auto closer from the partially latched state.

1. CHECK DTC.



Using the Subaru Select Monitor, read DTC of PRG CM. [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes

Perform the diagnosis for the displayed DTCs. [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 2.](#)

2. CHECK MEMORY HEIGHT SW.



Is the memory height SW ON?

Yes



[Go to 3.](#)

No

Set the memory height SW to ON.


3. CHECK EACH SW.



Perform inspections in "CHECK PRG INNER SW INPUT CIRCUIT", and "CHECK MEMORY HEIGHT SW INPUT CIRCUIT".  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > CHECK PRG INNER SW INPUT CIRCUIT.](#)  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > CHECK MEMORY HEIGHT SWITCH INPUT CIRCUIT.](#)

Is the check result OK?

Yes

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No


Repair it according to each inspection.

8. PRG OPENER BUTTON DOES NOT FUNCTION

Note:


Before performing diagnosis, initialize PRG SYS by opening PRG in manual operation, and then operating the power rear gate auto closer from the partially latched state.

1. CHECK DTC.


Using the Subaru Select Monitor, read DTC of PRG CM.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?


Yes

Perform the diagnosis for the displayed DTCs.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 2.](#)

2. CHECK DATA MONITOR.

Using Subaru Select Monitor, check [R/G Open SW].  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)

Does the display switch between "OFF", "tap" and "press and hold" according to PRG opener button operation?

Yes


 [Go to 4.](#)

No


 [Go to 3.](#)

3. CHECK BODY INTEGRATED UNIT.

- For vehicles with smart

Perform step 6 and subsequent procedures in "CANNOT UNLOCK WITH THE REAR GATE OPENER BUTTON" in KPS (DIAGNOSTICS).  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > REAR GATE CANNOT BE UNLOCKED WITH THE REAR GATE OPENER BUTTON.](#)

- For vehicles without smart

Perform "CHECK REAR GATE OPENER BUTTON CIRCUIT" in Door Lock Control System.  [Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > CHECK REAR GATE OPENER BUTTON CIRCUIT.](#)

Is the check result OK?


Yes

 [Go to 4.](#)

No

Repair it according to each inspection.

4. CHECK POWER REAR GATE AUTO CLOSER.

Refer to step 3 and subsequent procedures for DTC B2513, and check the power rear gate auto closer.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2513 LATCH CONDITION.](#)

Is the check result OK?


Yes

 [Go to 5.](#)

No

Repair it according to B2513 diagnosis.

5. CHECK SOLENOID.

Refer to step 4 and subsequent procedures for DTC B2523, and check the solenoid.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2523 HALF STOP SOLENOID FAILURE.](#)

Is the check result OK?

Yes


 [Go to 6.](#)

No

Repair it according to B2523 diagnosis.


6. CHECK CLUTCH.



Refer to step 4 and subsequent procedures for DTC B2509, and check the clutch.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2509 CLUTCH OPEN.](#)

Is the check result OK?

Yes


 [Go to 7.](#)

No

Repair it according to B2509 diagnosis.


7. CHECK PRG MOTOR OPEN CIRCUIT.



Perform step 4 and subsequent procedures for DTC B2507, and check the PRG motor open circuit.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2507 PRG MOTOR CIRCUIT OPEN.](#)

Is there any fault?

Yes


 [Go to 8.](#)

No

Repair it according to B2507 diagnosis.

8. CHECK PRG MOTOR SHORT.



Perform step 4 and subsequent procedures for DTC B2508, and check the PRG motor short circuit.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2508 PRG MOTOR CIRCUIT LOW.](#)

Is there any fault?

Yes


 [Go to 9.](#)

No

Repair it according to B2508 diagnosis.

9. CHECK ROTATION SENSOR.



Perform step 4 and subsequent procedures for DTC B250B, and check the rotation sensor.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble](#)

[Code \(DTC\)>DTC B250B ROTATION SENSOR A STUCK.](#)

Is there any fault?

Yes

[Go to 10.](#)

No

Repair it according to B250B diagnosis.

10. CHECK TOUCH SENSOR.

Perform step 3 and subsequent procedures for DTC B250A, and check the touch sensor. [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B250A TOUCH SENSORS BATT. GND SHORT OUT.](#)

Is there any fault?

Yes

Replace the PRG CM. [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No

Repair it according to B250A diagnosis.

9. OPERATION FROM KEYLESS/SMART MOBILE KEY IS NOT POSSIBLE

Note:

Before performing diagnosis, initialize PRG SYS by opening PRG in manual operation, and then operating the power rear gate auto closer from the partially latched state.

1. CHECK DTC.

Using the Subaru Select Monitor, read DTC of PRG CM. [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed? (Current malfunction)

Yes


Perform the diagnosis for the displayed DTCs. [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 2.](#)

2. CHECK DATA MONITOR.

Using Subaru Select Monitor, check [Normal Keyless R/G SW] or [Smart Keyless R/G SW].

 [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)

Does the display switch between "OFF", "tap" and "press and hold" according to mobile key SW operation?

Yes


 [Go to 4.](#)

No


 [Go to 3.](#)

3. CHECK BODY INTEGRATED UNIT.

- For vehicles with smart

Perform "KEYLESS ACCESS LOCK/UNLOCK CANNOT BE PERFORMED FROM ANY OF THE DOORS" in KPS (DIAGNOSTICS).  [Ref. to KEYLESS ACCESS WITH PUSH BUTTON START\(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION > KEYLESS ACCESS LOCK/UNLOCK CANNOT BE PERFORMED FROM ANY OF THE DOORS.](#)

- For vehicles without smart

Perform "NONE OF THE FUNCTIONS OF THE KEYLESS ENTRY SYSTEM OPERATE" in Door Lock Control System.  [Ref. to SECURITY AND LOCKS>Keyless Entry System>INSPECTION > SYMPTOM CHART.](#)

Is the check result OK?


Yes

 [Go to 4.](#)

No

Repair it according to each inspection.

4. CHECK POWER REAR GATE AUTO CLOSER.

Refer to step 3 and subsequent procedures for DTC B2513, and check the power rear gate auto closer.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2513 LATCH CONDITION.](#)

Is the check result OK?


Yes

 [Go to 5.](#)

No

Repair it according to B2513 diagnosis.

5. CHECK SOLENOID.

Refer to step 4 and subsequent procedures for DTC B2523, and check the solenoid.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2523 HALF STOP SOLENOID FAILURE.](#)

Is the check result OK?


Yes

 [Go to 6.](#)

No

Repair it according to B2523 diagnosis.

6. CHECK CLUTCH.

Refer to step 4 and subsequent procedures for DTC B2509, and check the clutch.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2509 CLUTCH OPEN.](#)

Is the check result OK?


Yes

 [Go to 7.](#)

No

Repair it according to B2509 diagnosis.

7. CHECK PRG MOTOR OPEN CIRCUIT.

Perform step 4 and subsequent procedures for DTC B2507, and check the PRG motor open circuit.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2507 PRG MOTOR CIRCUIT OPEN.](#)

Is the check result OK?


Yes

 [Go to 8.](#)

No

Repair it according to B2507 diagnosis.

8. CHECK PRG MOTOR SHORT.

Perform step 4 and subsequent procedures for DTC B2508, and check the PRG motor short circuit.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2508 PRG MOTOR CIRCUIT LOW.](#)

Is the check result OK?

Yes


 [Go to 9.](#)

No

Repair it according to B2508 diagnosis.


9. CHECK ROTATION SENSOR.

Perform step 4 and subsequent procedures for DTC B250B, and check the rotation sensor.

 [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B250B ROTATION SENSOR A STUCK.](#)

Is the check result OK?


Yes

 [Go to 10.](#)

No


Repair it according to B250B diagnosis.

10. CHECK TOUCH SENSOR.

Perform step 3 and subsequent procedures for DTC B250A, and check the touch sensor.  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B250A TOUCH SENSORS BATT. GND SHORT OUT.](#)

Is the check result OK?

Yes

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No

Repair it according to B250A diagnosis.

10. CHECK PRG DRIVER'S SW INPUT CIRCUIT

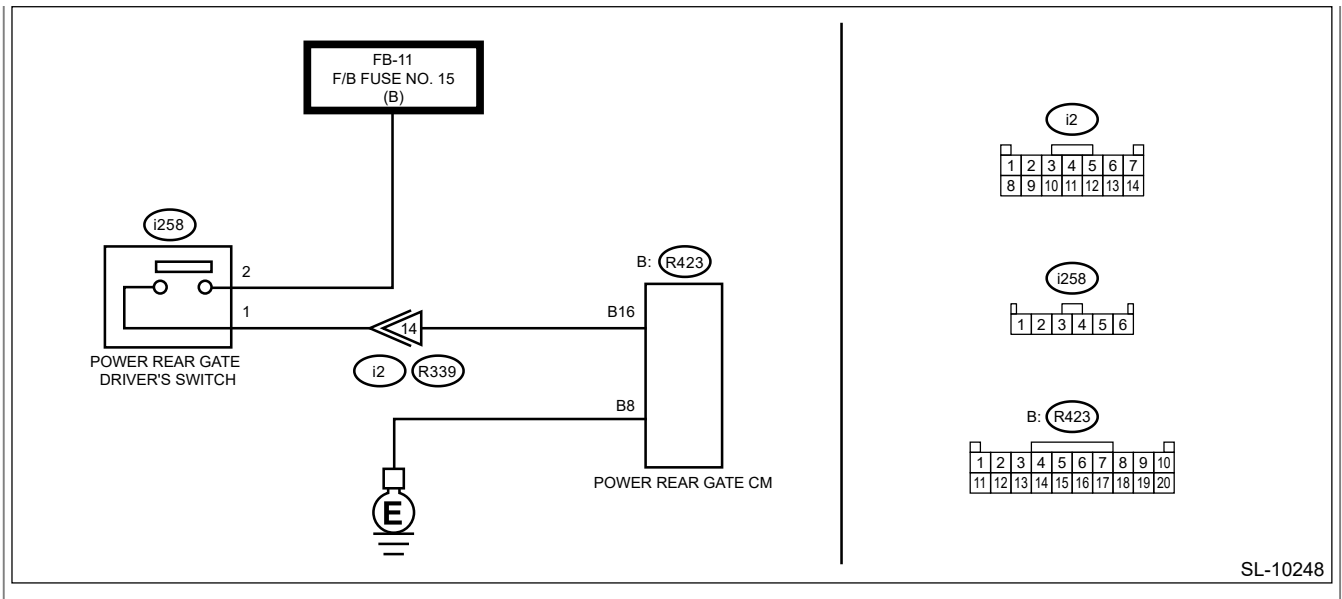
Note:

Before performing diagnosis, initialize PRG SYS by opening PRG in manual operation, and then operating the power rear gate auto closer from the partially latched state.

Wiring diagram:

Power rear gate system  [Ref. to WIRING SYSTEM>Power Rear Gate System>WIRING DIAGRAM.](#)





SL-10248

1. CHECK BACK-UP FUSE.



Check the fuse. [Ref. to POWER REAR GATE SYSTEM>Relay and Fuse.](#)

Is the check result OK?

Yes

[Go to 2.](#)

No

Replace the fuse.

2. CHECK DATA MONITOR.



Using Subaru Select Monitor, check [D SW]. [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)

Does the display switch between OFF ↔ ON according to PRG driver's SW operation?

Yes

Input circuit is normal.

No

[Go to 3.](#)

3. CHECK HARNESS (OPEN CIRCUIT).



1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Disconnect the memory height SW connector.

4. Turn the ignition switch to ON.
5. Measure the resistance between PRG CM connector and PRG driver's SW connector.

Connector & terminal

(R423) No. 16 — (i258) No. 1:

Is the resistance less than 10 Ω ?

Yes

 [Go to 4.](#)

No

Repair or replace the open circuit of harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).



Measure the resistance between PRG CM connector and chassis ground.

Connector & terminal

(R423) No. 16 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair or replace the short circuit of the harness.

5. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).



Measure the voltage between PRG CM connector and chassis ground.

Connector & terminal

(R423) No. 16 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes

 [Go to 6.](#)

No

Repair or replace the short circuit of the harness.

6. CHECK HARNESS (POWER SUPPLY CIRCUIT).




Measure the voltage between PRG driver's SW connector and chassis ground.

Connector & terminal

(i258) No. 2 (+) — Chassis ground (-):

Is the voltage 10.5 V or more and less than 16 V?

Yes

 [Go to 7.](#)

No

Repair or replace the open circuit of harness.

7. CHECK HARNESS (OPEN CIRCUIT).




Measure the resistance between PRG CM connector and chassis ground.

Connector & terminal

(R423) No. 8 — Chassis ground:

Is the resistance less than 10 Ω ?

Yes

 [Go to 8.](#)

No

Repair or replace the open circuit of harness.

8. CHECK MEMORY HEIGHT SW UNIT.



Measure the switch resistance.

Terminals


No. 1 —No. 2:

Is the resistance 1 M Ω or more at OFF, and less than 1 Ω at ON?

Yes

 [Go to 9.](#)

No

Replace the memory height SW.  [Ref. to POWER REAR GATE SYSTEM>Memory Height Switch.](#)


9. CHECK CONNECTOR.



Check for poor contact of connector.

Is the check result OK?

Yes

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No

Repair or replace the poor contact of connector.

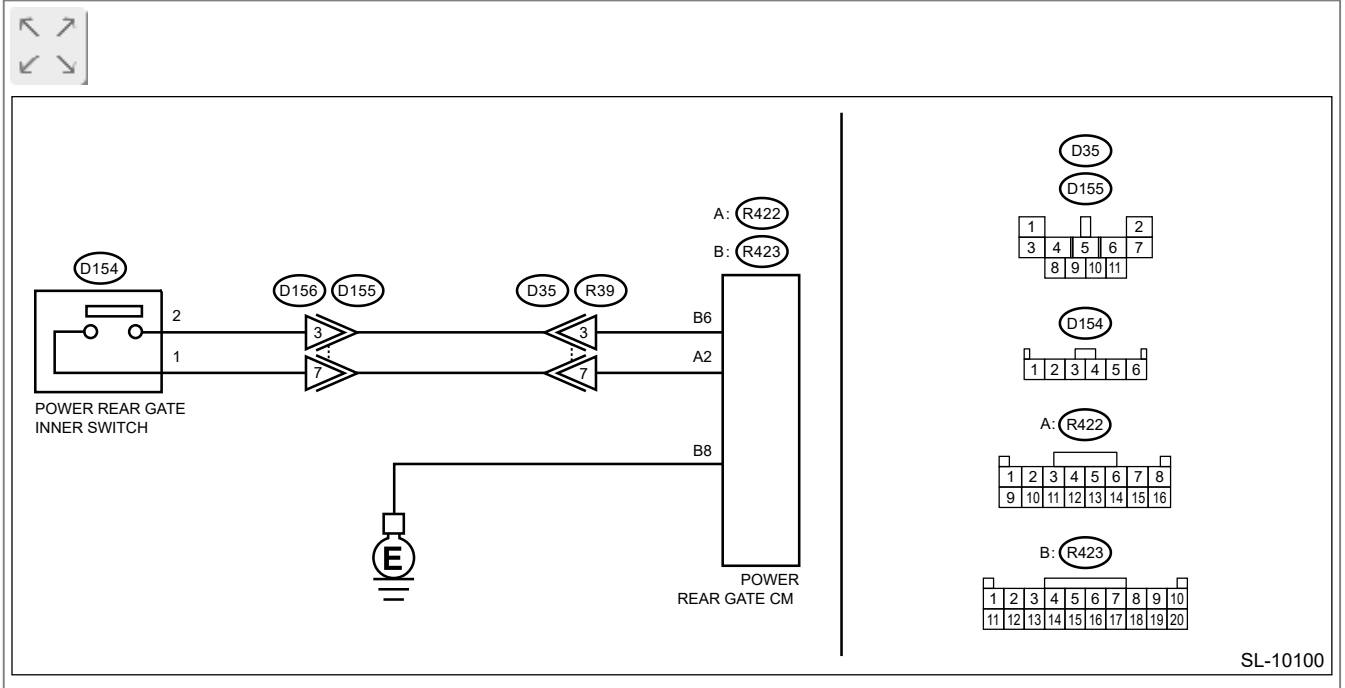
11. CHECK PRG INNER SW INPUT CIRCUIT

Note:


Before performing diagnosis, initialize PRG SYS by opening PRG in manual operation, and then operating the power rear gate auto closer from the partially latched state.

Wiring diagram:

Power rear gate system  [Ref. to WIRING SYSTEM>Power Rear Gate System>WIRING DIAGRAM.](#)



1. CHECK DATA MONITOR.

Using Subaru Select Monitor, check [R/G inner SW].  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Data Monitor.](#)

Does the display switch between OFF ↔ ON according to PRG inner SW operation?

Yes

Input circuit is normal.

No

 [Go to 2.](#)

2. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the PRG CM connector.
3. Disconnect the PRG inner SW connector.
4. Turn the ignition switch to ON.
5. Measure the resistance between PRG CM connector and PRG inner SW connector.

Connector & terminal

(R422) No. 2 — (i154) No. 1:

(R423) No. 6 — (i154) No. 2:

Is the resistance less than 10 Ω ?

Yes

 [Go to 3.](#)

No

Repair or replace the open circuit of harness.

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

Measure the resistance between PRG CM connector and chassis ground.

Connector & terminal

(R422) No. 2 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair or replace the short circuit of the harness.

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

Measure the voltage between PRG CM connector and chassis ground.

Connector & terminal

(R423) No. 6 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes

 [Go to 5.](#)

No

Repair or replace the short circuit of the harness.

5. CHECK HARNESS (OPEN CIRCUIT).

Measure the resistance between PRG CM connector and chassis ground.

Connector & terminal

(R423) No. 8 — Chassis ground:

Is the resistance less than 10 Ω ?

Yes

 [Go to 6.](#)

No

Repair or replace the short circuit of the harness.

6. CHECK PRG CM.



Measure the voltage between PRG CM connector and chassis ground.

Connector & terminal


(R422) No. 2 (+) — Chassis ground (-):

Is the voltage 10.5 V or more and less than 16 V?

Yes

 [Go to 7.](#)

No

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

7. CHECK PRG INNER SW UNIT.



Measure the switch resistance.

Terminals


No. 2 —No. 3:

Is the resistance 1 M Ω or more at OFF, and less than 1 Ω at ON?

Yes

 [Go to 8.](#)

No

Replace the PRG inner SW.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Inner Switch.](#)


8. CHECK CONNECTOR.



Check for poor contact of connector.

Is the check result OK?

Yes

Replace the PRG CM.  [Ref. to POWER REAR GATE SYSTEM>Power Rear Gate Control Module.](#)

No

Repair or replace the poor contact of connector.

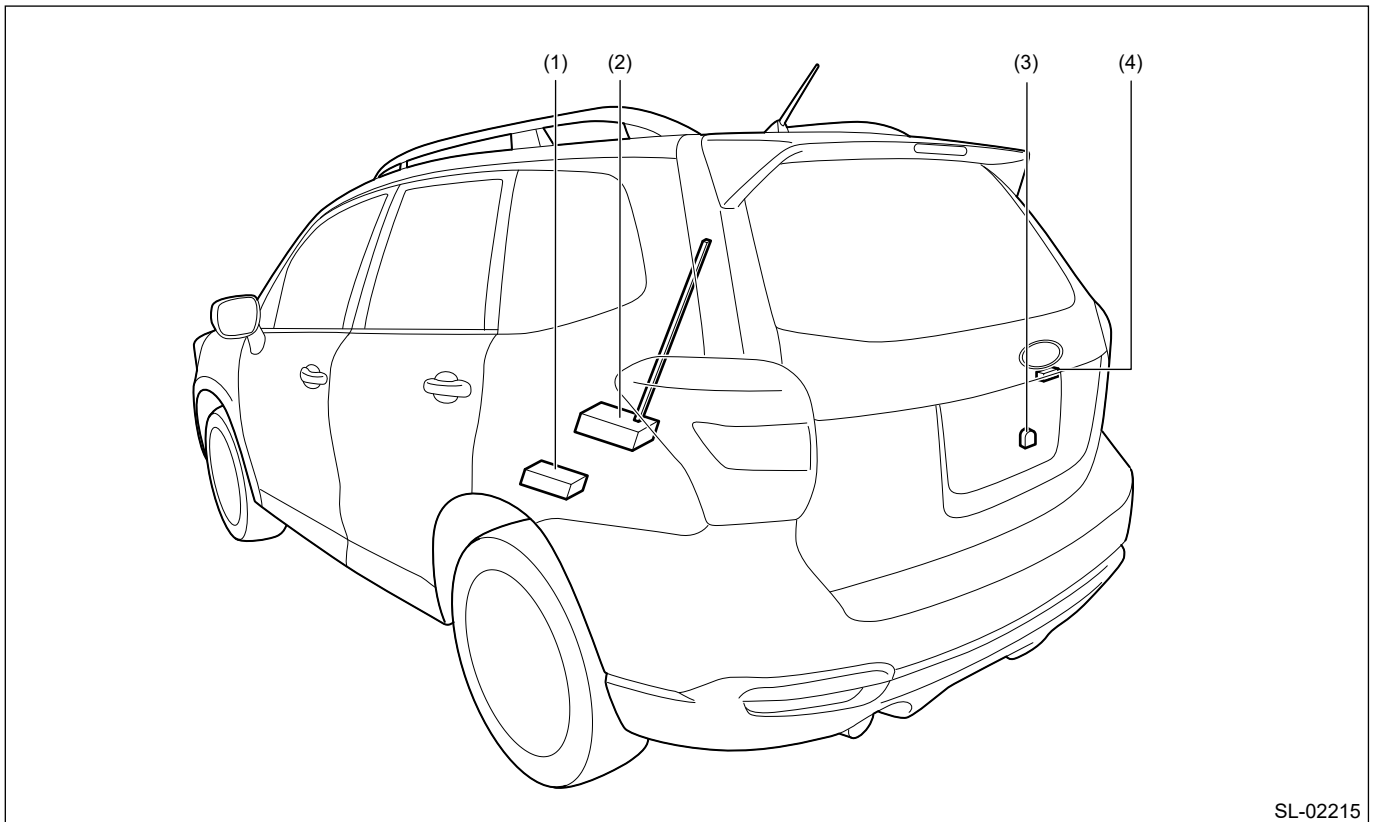
POWER REAR GATE(DIAGNOSTICS) > Diagnostics with Phenomenon

LIST

Symptoms	Note
Turn hazard lights do not illuminate	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > TURN HAZARD LIGHTS DO NOT ILLUMINATE.
The buzzer does not sound	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE BUZZER DOES NOT SOUND.
Half-stop cannot be cancelled	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > HALF-STOP CANNOT BE CANCELLED.
Operation by the PRG driver's SW is not possible	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > OPERATION BY THE PRG DRIVER'S SW IS NOT POSSIBLE.
Memory height SW does not function.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK MEMORY HEIGHT SWITCH INPUT CIRCUIT.
PRG inner SW does not function	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > PRG INNER SW DOES NOT FUNCTION.
PRG position cannot be memorized.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > PRG POSITION CANNOT BE MEMORIZED.
PRG opener button does not function	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > PRG OPENER BUTTON DOES NOT FUNCTION.
Operation from keyless/smart mobile key is not possible.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > OPERATION FROM KEYLESS/SMART MOBILE KEY IS NOT POSSIBLE.
Check PRG driver's SW input circuit	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK PRG DRIVER'S SW INPUT CIRCUIT.
Check PRG inner SW input circuit	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK PRG INNER SW INPUT CIRCUIT.

POWER REAR GATE(DIAGNOSTICS) > Electrical Component Location

LOCATION

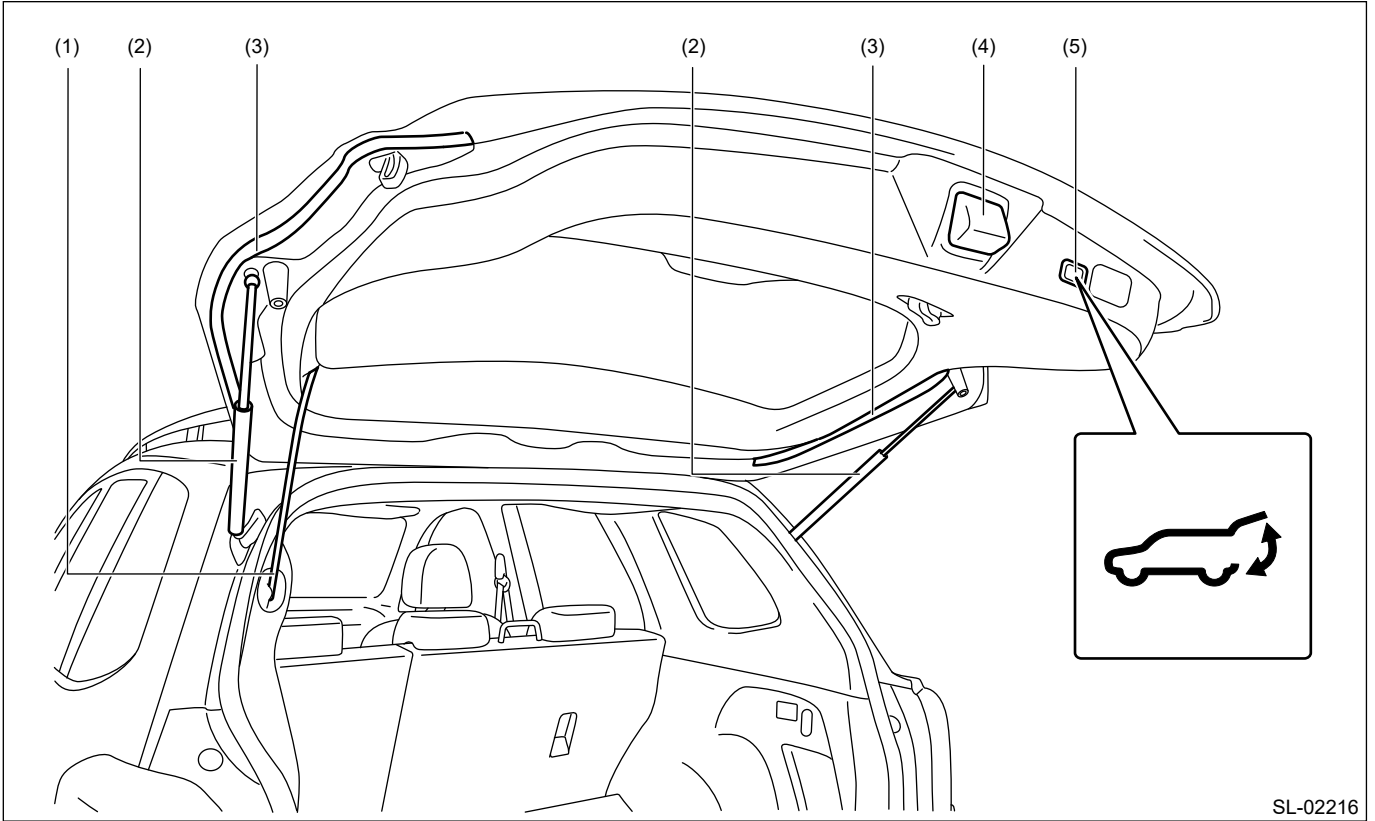


(1) Power rear gate control module (PRG CM)

(2) Power rear gate drive unit (PRG DU)

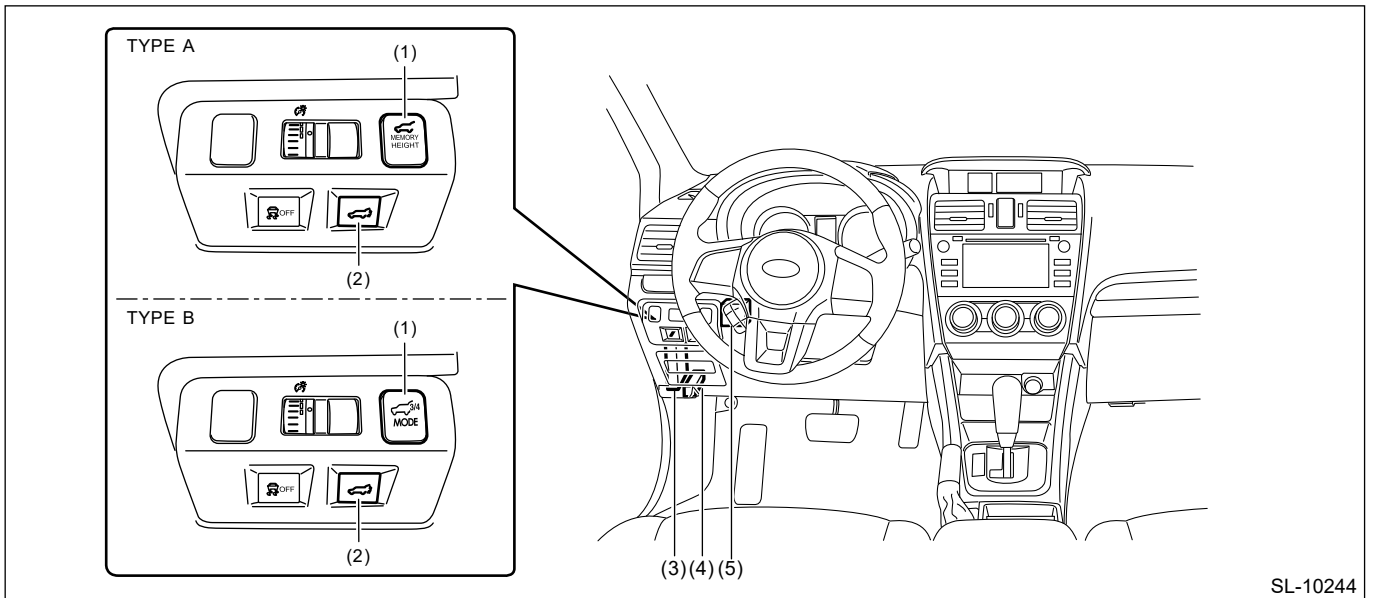
(3) Power rear gate buzzer

(4) Rear gate opener button (PRG)



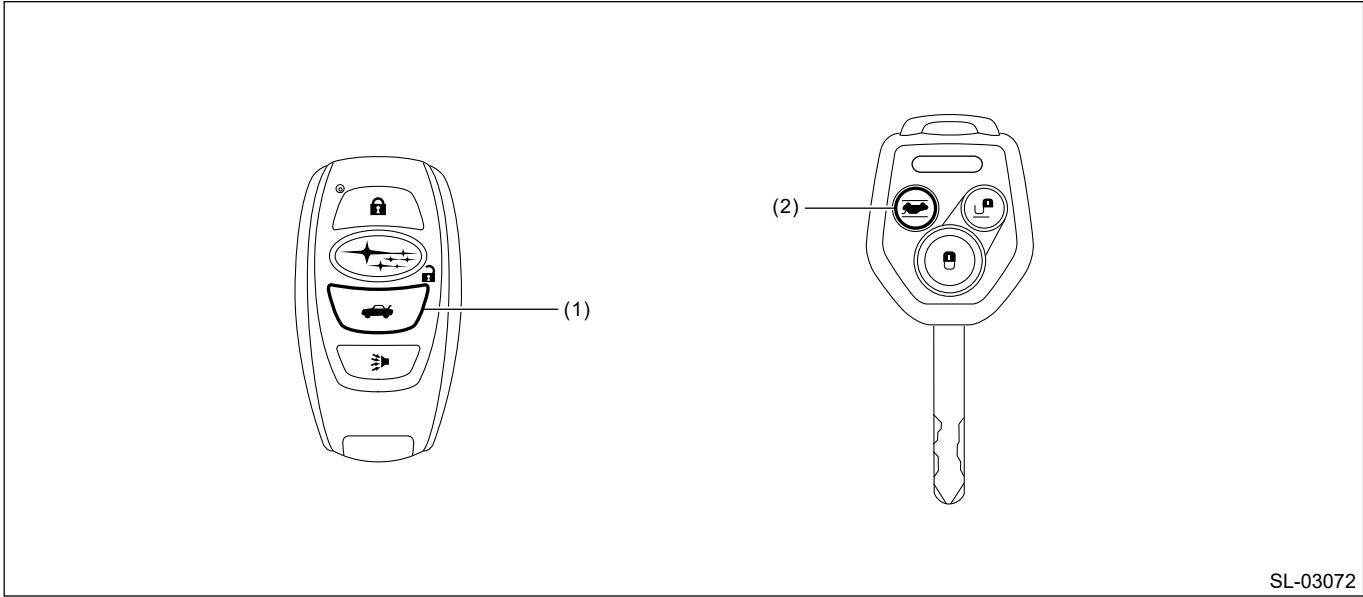
SL-02216

- (1) Rod - power rear gate
- (2) Gas damper
- (3) Power rear gate touch sensor
- (4) Power rear gate auto closer
- (5) Power rear gate inner switch



SL-10244

- (1) Memory height switch
- (2) Power rear gate driver's switch
- (3) Body integrated unit
- (4) Data link connector switch
- (5) Turn hazard control module



SL-03072

(1) Rear gate/trunk SW (access key)
(With keyless access with push button start system)

(2) Rear gate/trunk SW (keyless transmitter)
(Without keyless access with push button start system)

POWER REAR GATE(DIAGNOSTICS) > General Description

CAUTION

1. AIRBAG SYSTEM

Caution:




- **Do not use the electrical test equipment on the airbag system wiring harnesses and connector circuits.**
- **Be careful not to damage the airbag system wiring harness.**

POWER REAR GATE(DIAGNOSTICS) > General Description

INSPECTION

1. BASIC INSPECTION


Before performing diagnosis, check the following items which might affect power rear gate related problems.

- 1.** Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery>INSPECTION.](#)
 [Ref. to STARTING/CHARGING SYSTEMS\(H4DOTC\)>General Description.](#)
- 2.** Check the relay and fuse condition.  [Ref. to POWER REAR GATE SYSTEM>Relay and Fuse.](#)
- 3.** Check the connecting condition of harness and harness connector.

POWER REAR GATE(DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL


ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	— (Newly adopted tool)	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".










2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.
Oscilloscope	Used for measuring the waveform.

POWER REAR GATE(DIAGNOSTICS) > List of Diagnostic Trouble Code (DTC)

LIST

DTC	Item	Content of diagnosis	Reference
B2500	BATTERY POWER SUPPLY	Abnormality of PRG CM power supply voltage is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2500 BATTERY POWER SUPPLY.
B2501	PRG ECU MALFUNCTION	Malfunction of motor operation is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2501 PRG ECU MALFUNCTION.
B2502	TOUCH SENSORS (L) FAILURE	Malfunction of touch sensor L is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2502 TOUCH SENSORS (L) FAILURE.
B2503	TOUCH SENSORS (R) FAILURE	Malfunction of touch sensor R is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2503 TOUCH SENSORS (R) FAILURE.
B2504	TOUCH SENSORS (L) ON FIXATION	Seizure of touch sensor L is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2504 TOUCH SENSORS (L) ON FIXATION.
B2505	TOUCH SENSORS (R) ON FIXATION	Seizure of touch sensor R is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2505 TOUCH SENSORS (R) ON FIXATION.
B2506	PRG MOTOR CURRENT SURGE	Overcurrent in motor circuit is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2506 PRG MOTOR CURRENT SURGE.
B2507	PRG MOTOR CIRCUIT OPEN	Open circuit in motor is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2507 PRG MOTOR CIRCUIT OPEN.

B2508	PRG MOTOR CIRCUIT LOW	Ground fault in motor circuit is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2508 PRG MOTOR CIRCUIT LOW.
B2509	CLUTCH OPEN	Open or short circuit in clutch is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2509 CLUTCH OPEN.
B250A	TOUCH SENSORS BATT. GND SHORT OUT	Malfunction of touch sensor is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B250A TOUCH SENSORS BATT. GND SHORT OUT.
B250B	ROTATION SENSOR A STUCK	Malfunction of rotation sensor is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B250B ROTATION SENSOR A STUCK.
B250D	ROTATION SENSOR B STUCK	Malfunction of rotation sensor is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B250D ROTATION SENSOR B STUCK.
B250F	ROTATION SENSOR PULSE/COUNT	Malfunction of rotation sensor is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B250F ROTATION SENSOR PULSE/COUNT.
B2511	ROTATION SENSOR PULSE/REVERSE DIRECTION	Malfunction of rotation sensor is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2511 ROTATION SENSOR PULSE/REVERSE DIRECTION.
B2512	DAMPER BREAKAGE	Malfunction of gas damper is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2512 DAMPER BREAKAGE.
B2513	LATCH CONDITION	Malfunction of switch inside auto power rear gate closer is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2513 LATCH CONDITION.
B2514	IGNITION	Inconsistency of signals between LIN communication	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic

		line and direct line.	Procedure with Diagnostic Trouble Code (DTC)>DTC B2514 IGNITION.
B2515	LATCH SW	Malfunction of switch inside auto power rear gate closer is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2515 LATCH SW.
B2516	SECTOR SW	Malfunction of switch inside auto power rear gate closer is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2516 SECTOR SW.
B2517	COURTESY SW	Malfunction of switch inside auto power rear gate closer is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2517 COURTESY SW.
B2518	PRG CONTINUOUSLY-WORKING FAILURE	When the motor operation continued for 30 seconds or more.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2518 PRG CONTINUOUSLY-WORKING FAILURE.
B2519	POWER +B OPEN	Malfunction of PRG CM power supply system is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2519 POWER +B OPEN.
B251A	LIN CONNECTION NO-RECEIVE DATA	Malfunction of LIN communication system is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B251A LIN CONNECTION NO-RECEIVE DATA.
B251B	LIN CONNECTION BUS PHYSICAL	Malfunction of LIN communication system is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B251B LIN CONNECTION BUS PHYSICAL.
B251D	AT/MT JUDGMENT FAILURE	Malfunction of LIN communication system is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B251D AT/MT JUDGMENT FAILURE.
B2522	EEPROM	Malfunction is detected inside PRG CM.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2522 EEPROM.
B2523	HALF STOP SOLENOID	Malfunction of keep solenoid is detected.	 Ref. to POWER REAR GATE(DIAGNOSTICS)>Diagnostic

	FAILURE	Procedure with Diagnostic Trouble Code (DTC)>DTC B2523 HALF STOP SOLENOID FAILURE.
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POWER REAR GATE(DIAGNOSTICS) > Subaru Select Monitor

INSPECTION

Detecting condition:

- Defective harness connector
- Power supply circuit malfunction
- Defective power rear gate control module
- Defective LIN communication circuit
- Defective Subaru Select Monitor

Trouble symptom:

Communication is impossible between the power rear gate control module and Subaru Select Monitor.

1. CHECK OTHER COMMUNICATION.


Perform communication with the system other than the power rear gate control module using the Subaru Select Monitor.

Is the communication to other control module possible?


Yes

 [Go to 2.](#)

No


Perform the "Communication for Initializing Impossible" of LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

2. CHECK BODY INTEGRATED UNIT COMMUNICATION.

Read the DTC of the body integrated unit.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U0230 displayed?

Yes


Perform the diagnosis of DTC U0230.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC U0230 LOST COMMUNICATION WITH POWER REAR GATE CONTROL MODULE.](#)

No

It is possible that temporary poor communication occurs.

POWER REAR GATE(DIAGNOSTICS) > Subaru Select Monitor

OPERATION

- For detailed operation procedures, refer to "Application help".
- When the power rear gate control module cannot communicate with Subaru Select Monitor, perform "COMMUNICATION FOR INITIALIZING IMPOSSIBLE".  [Ref. to POWER REAR GATE\(DIAGNOSTICS\)>Subaru Select Monitor>INSPECTION.](#)

PROCEDURE

1. PERFORM CUSTOMER INTERVIEW.



Using the Check List for Interview, ask the customer the condition of how the trouble occurred. [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Check List for Interview.](#)

Did you interview the customer?

Yes

[Go to 2.](#)

No

Interview the customer.

2. CHECK LAN SYSTEM.



Inspect LAN system. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

Is the check result OK?

Yes

[Go to 3.](#)

No

Perform the inspection according to the diagnosis for LAN system.

3. CHECK POWER SEAT MEMORY.



Using the Subaru Select Monitor, read DTC of power seat memory. [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?


Yes

Perform the diagnosis for the displayed DTCs. [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)
After the repair, [Go to 5.](#)

No

[Go to 4.](#)

4. CHECK THE LIST OF TROUBLE SYMPTOMS.

Check "TROUBLE SYMPTOM" for the power seat system.  [Ref. to SEATS>Power Seat System.](#)

Does the symptom apply?

Yes

Perform the diagnosis according to the inspection procedures.


No

Currently, system is normal. The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:


In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

5. PERFORM INSPECTION MODE.

Perform the Inspection Mode.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Inspection Mode.](#)

Are any DTCs displayed?

Yes

Perform the diagnosis for the displayed DTCs.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Finish the diagnosis.

POWER SEAT MEMORY(DIAGNOSTICS) > Check List for Interview

CHECK

- Inspect the following items regarding the vehicle’s state.
- Print out this page for interviewing customers.



Power Seat Memory System Check List for Interview			Date the Vehicle is	
Received	Year	Month	Day	
Customer’s name		Registration No.	Initial year of registration	
		Vehicle model	Frame number	
Inspector	Inspector	Engine type	Odometer reading	
Customer specified content				
<ul style="list-style-type: none"> • • • 				
Date when problem occurred	Year	Month	Frequency of trouble occurrence	Always occurs Sometimes occurs (times per day, times per month)
Condition of trouble occurrence (How the trouble occurs)			Weather	Fine • Cloudy • Rainy • Snowy • Others ()
			Temperature	°C (°F) — °C (°F)
Road conditions			Occurrence location	
Accessory installation condition				
Confirmation of trouble condition				
DTC				

POWER SEAT MEMORY(DIAGNOSTICS) > Clear memory

OPERATION

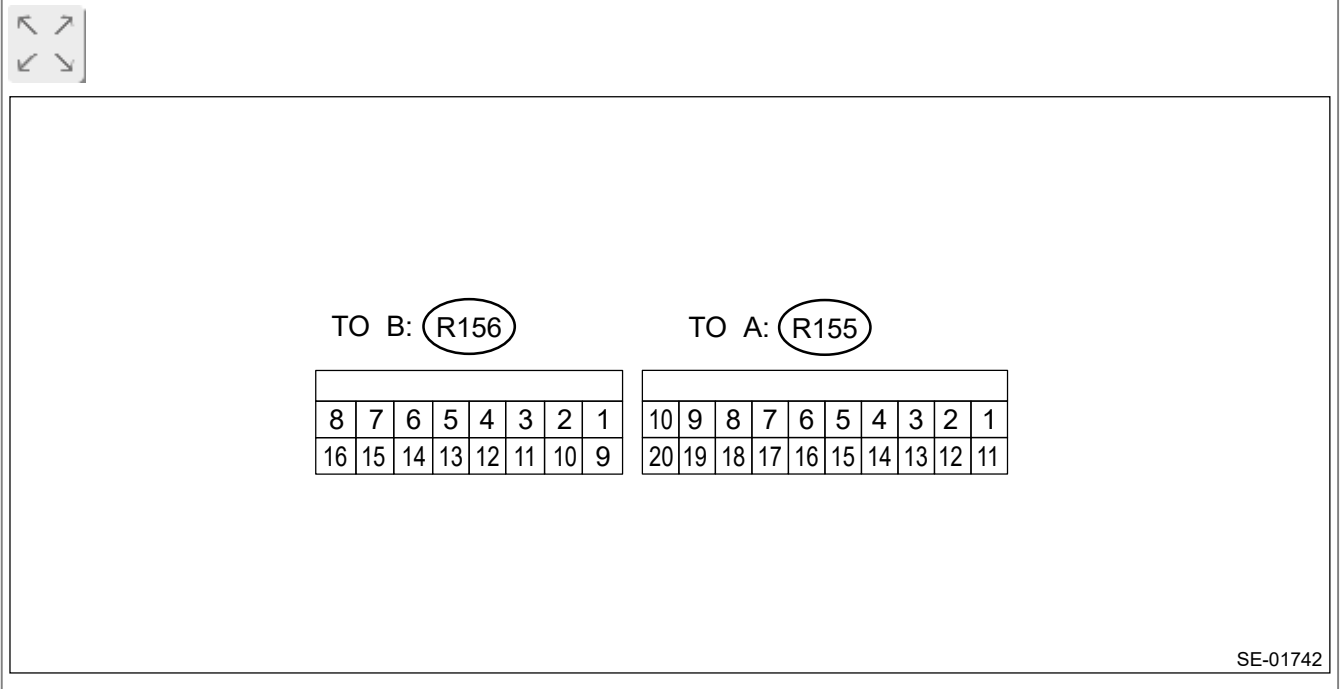
1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Power Seat Memory], and then select [Enter].
5. On [Select Function] display, select [DTC].
6. On [DTC] display, select [Clear memory].

Note:

For operation procedures, refer to “Application help”.

ELECTRICAL SPECIFICATION

1. POWER SEAT CONTROL MODULE



Terminal No.	Content	Measuring condition	Standard
(R155) No. 1	—	—	—
(R155) No. 2 ↔ Chassis ground	Lifter switch (down)	Switch ON	1.5 V or less
(R155) No. 3 ↔ Chassis ground	Lifter switch (up)	Switch ON	1.5 V or less
(R155) No. 4 ↔ Chassis ground	Tilt switch (down)	Switch ON	1.5 V or less
(R155) No. 5 ↔ Chassis ground	Tilt switch (up)	Switch ON	1.5 V or less
(R155) No. 6 ↔ Chassis ground	Slide switch (forward)	Switch ON	1.5 V or less
(R155) No. 7 ↔ Chassis ground	Slide switch (rearward)	Switch ON	1.5 V or less
(R155) No. 8 ↔ Chassis ground	Reclining switch (forward)	Switch ON	1.5 V or less
(R155) No. 9 ↔ Chassis ground	Reclining switch (backward)	Switch ON	1.5 V or less
(R155) No. 10 ↔ Chassis ground	Battery power supply	Always	10 — 16 V
(R155) No. 11 ↔ Chassis ground	Ignition power supply	When ignition switch is ON	10 — 16 V

(R155) No. 12	LIN communication line	Unmeasurable	—
(R155) No. 13 ↔ Chassis ground	Memory switch 1	Switch ON	1 V or less
(R155) No. 14 ↔ Chassis ground	Memory switch 2	Switch ON	1 V or less
(R155) No. 15 ↔ Chassis ground	SET switch	Switch ON	1 V or less
(R155) No. 16 ↔ (R155) No. 20	Reclining pulse signal	When the motor is in operation	Pulse output
(R155) No. 17 ↔ (R155) No. 20	Tilt pulse signal	When the motor is in operation	Pulse output
(R155) No. 18 ↔ (R155) No. 20	Lifter pulse signal	When the motor is in operation	Pulse output
(R155) No. 19 ↔ (R155) No. 20	Slide pulse signal	When the motor is in operation	Pulse output
(R155) No. 20 ↔ Chassis ground	Pulse signal GND	Always	1 Ω or less
(R156) No. 1 ↔ Chassis ground	Lifter motor up	When the motor is in operation	9.5 — 16 V
(R156) No. 2 ↔ Chassis ground	Lifter motor down	When the motor is in operation	9.5 — 16 V
(R156) No. 3 ↔ Chassis ground	Battery power supply	Always	10 — 16 V
(R156) No. 4 ↔ Chassis ground	Tilt motor up	When the motor is in operation	9.5 — 16 V
(R156) No. 5 ↔ Chassis ground	Tilt motor down	When the motor is in operation	9.5 — 16 V
(R156) No. 6 ↔ Chassis ground	Reclining motor forward	When the motor is in operation	9.5 — 16 V
(R156) No. 7 ↔ Chassis ground	Reclining motor backward	When the motor is in operation	9.5 — 16 V
(R156) No. 8 ↔ Chassis ground	Battery power supply	Always	10 — 16 V
(R156) No. 9 ↔ Chassis ground	Encoder power supply output	Always	1 MΩ or more
(R156) No. 10	—	—	—
(R156) No. 11	—	—	—
(R156) No. 12 ↔ Chassis ground	GND	Always	1 Ω or less
(R156) No. 13	—	—	—
(R156) No. 14 ↔ Chassis ground	GND	Always	1 Ω or less
(R156) No. 15 ↔ Chassis	Slide motor rearward	When the motor is in	9.5 — 16 V

ground		operation	
(R156) No. 16 ↔ Chassis ground	Slide motor forward	When the motor is in operation	9.5 – 16 V

POWER SEAT MEMORY(DIAGNOSTICS) > Data Monitor

LIST

Display	Content	Standard	Note
Battery Terminal Voltage	Battery voltage is displayed.	0 — 25.5 V	—
Ignition Switch	Ignition switch status is displayed.	ON: When ignition switch is ON OFF: When ignition switch is OFF	—
Set SW	Status of the set switch in seat memory switch is displayed.	ON: When set switch is ON OFF: When set switch is OFF	—
Memory SW1	Status of the memory switch 1 in seat memory switch is displayed.	ON: When memory switch 1 is ON OFF: When memory switch 1 is OFF	—
Memory SW2	Status of the memory switch 2 in seat memory switch is displayed.	ON: When memory switch 2 is ON OFF: When memory switch 2 is OFF	—
Slide SW	Status of the slide switch in power seat switch is displayed.	OFF: When slide switch is OFF FRONT: When slide switch (forward) is ON REAR: When slide switch (rearward) is ON	—
Reclining SW	Status of the reclining switch in power seat switch is displayed.	OFF: When reclining switch is OFF FRONT: When reclining switch (forward) is ON REAR: When reclining switch (backward) is ON	—
Lifter SW	Status of the lifter switch in power seat switch is displayed.	OFF: When lifter switch is OFF UP: When lifter switch (up) is ON DOWN: When lifter switch (down) is ON	—
Tilt SW	Status of the tilt switch in power seat switch is displayed.	OFF: When tilt switch is OFF UP: When tilt switch (up) is ON	—

		DOWN: When tilt switch (down) is ON	
Pulse Power Circuit	Motor pulse sensor power supply circuit status is displayed.	Normal: At normal condition Abnormal: At abnormal condition	—
Slide Output	Power seat control module output status is displayed. (Slide motor)	OFF: When OFF FRONT: When moved forward REAR: When moved rearward	—
Reclining Output	Power seat control module output status is displayed. (Reclining motor)	OFF: When OFF FRONT: When moved forward REAR: When moved rearward	—
Lifter Output	Power seat control module output status is displayed. (Lifter motor)	OFF: When OFF UP: When moved upward DOWN: When moved downward	—
Tilt Output	Power seat control module output status is displayed. (Tilt motor)	OFF: When OFF UP: When moved upward DOWN: When moved downward	—
Memory SW1 Memorized	Registration status of the memory switch 1 in seat memory switch	Yes: When registered No: When not registered	—
Memory SW2 Memorized	Registration status of the memory switch 2 in seat memory switch	Yes: When registered No: When not registered	—
Keyless Access & Start Link 1 Memorized	Registration status of keyless access key	Yes: When registered No: When not registered	Seat memory operates when the key No. displayed in the Keyless Access Key Information is registered in the item shown on the left.
Keyless Access & Start Link 2 Memorized	Registration status of keyless access key	Yes: When registered No: When not registered	
Keyless Access & Start Link 3 Memorized	Registration status of keyless access key	Yes: When registered No: When not registered	
Keyless Access & Start Link 4 Memorized	Registration status of keyless access key	Yes: When registered No: When not registered	
Keyless Access & Start Link 5 Memorized	Registration status of keyless access key	Yes: When registered No: When not registered	
Keyless Access & Start Link 6 Memorized	Registration status of keyless access key	Yes: When registered No: When not registered	

Keyless Access & Start Link 7 Memorized	Registration status of keyless access key	Yes: When registered No: When not registered	
Keyless Access Key Information	Key No. identified by the vehicle is displayed.	Without: When there is no registered key Keyless Access & Start Link 1: Keyless Access & Start Link 2: Keyless Access & Start Link 3: Keyless Access & Start Link 4: Keyless Access & Start Link 5: Keyless Access & Start Link 6: Keyless Access & Start Link 7:	—
Slide Position	Slide motor position is displayed.	-32768 — 32767	—
Reclining Position	Reclining motor position is displayed.	-32768 — 32767	—
Lifter Position	Lifter motor position is displayed.	-32768 — 32767	—
Tilt Position	Tilt motor position is displayed.	-32768 — 32767	—

POWER SEAT MEMORY(DIAGNOSTICS) > Data Monitor

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Power Seat Memory], and then select [Enter].
5. On [Select Function] display, select [Data monitor].

Note:

For detailed operation procedures, refer to "Application help".

POWER SEAT MEMORY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2600 LIN COMMUNICATION


DTC detecting condition:

No signal is received from body integrated unit for a certain period of time (2100 ms) or more. Or, transmission from the power seat control module is not possible for a certain period of time (2100 ms) or more.

Trouble symptom:


- Seat operation is possible with manual operation, but not with memory function.
- Registration is possible with memory switch, but not with keyless access push button start system.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of the power seat control module using the Subaru Select Monitor.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2600 displayed? (Current malfunction)

Yes

 [Go to 2.](#)


No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and perform the diagnosis again.

Note:


In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK DTC.

Read the DTC of body integrated unit using Subaru Select Monitor.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U0208 displayed? (Current malfunction)



Yes

Perform the diagnosis of DTC U0208.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC U0208 LOST COMMUNICATION WITH SEAT MEMORY.](#)

No


 [Go to 3.](#)

3. CHECK BODY INTEGRATED UNIT.

1. Turn the ignition switch to OFF.
2. Replace with a power seat control module working properly.  [Ref. to SEATS>Power Seat System.](#)
3. Turn the ignition switch to ON.
4. Read the DTC of the power seat control module using the Subaru Select Monitor.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2600 displayed? (Current malfunction)

Yes

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

No

There was an abnormality in power seat control module.

POWER SEAT MEMORY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2601 LIN CIRCUIT LOW

DTC detecting condition:


LIN communication circuit with the body integrated unit is shorted for a certain period of time (4000 ms) or more.

Trouble symptom:

Seat operation is possible with manual operation, but not with memory function.

Registration is possible with memory switch, but not with keyless access push button start system.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of the power seat control module using the Subaru Select Monitor.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2601 displayed? (Current malfunction)

Yes

 [Go to 2.](#)


No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and perform the diagnosis again.

Note:


In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK DTC.

Read the DTC of body integrated unit using Subaru Select Monitor.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC U0208 displayed? (Current malfunction)



Yes

Perform the diagnosis of DTC U0208.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC U0208 LOST COMMUNICATION WITH SEAT MEMORY.](#)

No


 [Go to 3.](#)

3. CHECK BODY INTEGRATED UNIT.

- 1.** Turn the ignition switch to OFF.
- 2.** Replace with a power seat control module working properly.  [Ref. to SEATS>Power Seat System.](#)
- 3.** Turn the ignition switch to ON.
- 4.** Read the DTC of the power seat control module using the Subaru Select Monitor.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2601 displayed? (Current malfunction)

Yes

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

No

There was an abnormality in power seat control module.

POWER SEAT MEMORY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2602 VEHICLE SPEED CONTROL

DTC detecting condition:


Detection of 300km/h or more continued for a certain period of time (2100 ms) or more.

Trouble symptom:

Seat operation is possible with manual operation, but not with memory function.

(Memory registration is possible.)

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of the power seat control module using the Subaru Select Monitor.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2602 displayed? (Current malfunction)

Yes

 [Go to 2.](#)


No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK DTC.

Perform the inspection for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

Is the check result OK?


Yes

 [Go to 3.](#)

No

Perform the inspection according to the diagnosis for LAN system.

3. CHECK VEHICLE SPEED SIGNAL OF VDC MODULE.

Stop the vehicle, and read the data monitor [FR Wheel Speed][FL Wheel Speed][RR Wheel Speed][RL Wheel Speed] of VDC module using the Subaru Select Monitor.  [Ref. to](#)

[BRAKE CONTROL \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Is the displayed value abnormal?


Yes

Replace the VDC module, or inspect the vehicle speed sensor harness circuit.

No

 [Go to 4.](#)

4. CHECK BODY INTEGRATED UNIT VEHICLE SPEED SIGNAL.

Stop the vehicle, and read the data monitor [Front Wheel Speed] of body integrated unit using the Subaru Select Monitor.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Data Monitor.](#)

Is the displayed value abnormal?



Yes

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

No

 [Go to 5.](#)

5. CHECK POWER SEAT CONTROL MODULE.

1. Turn the ignition switch to OFF.
2. Replace with a power seat control module working properly.  [Ref. to SEATS>Power Seat System.](#)
3. Turn the ignition switch to ON.
4. Read the DTC of the power seat control module using the Subaru Select Monitor.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2602 displayed? (Current malfunction)

Yes

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

No

There was an abnormality in power seat control module.

POWER SEAT MEMORY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2603 EPB CONTROL

DTC detecting condition:


Detection of EPB abnormal signal continued for a certain period of time (2100 ms) or more.

Trouble symptom:

Seat operation is possible with manual operation, but not with memory function.

(Memory registration is possible.)

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of the power seat control module using the Subaru Select Monitor.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2603 displayed? (Current malfunction)

Yes

 [Go to 2.](#)


No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK DTC.

Perform the inspection for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

Is the check result OK?


Yes

 [Go to 3.](#)


No

Perform the inspection according to the diagnosis for LAN system.

3. CHECK BODY INTEGRATED UNIT.


1. Turn the ignition switch to OFF.
2. Replace with a power seat control module working properly.  [Ref. to SEATS>Power](#)

[Seat System.](#)

3. Turn the ignition switch to ON.
4. Read the DTC of the power seat control module using the Subaru Select Monitor. 
[Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2603 displayed? (Current malfunction)

Yes

Replace the body integrated unit.  [Ref. to SECURITY AND LOCKS>Body Integrated Unit.](#)

No

There was an abnormality in power seat control module.

POWER SEAT MEMORY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2604 POWER SEAT MEMORY EEPROM


DTC detecting condition:

There is a difference between writing value and reading value of power seat control module EEPROM.

Trouble symptom:


Seat operation is possible with manual operation, but not with memory function.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of the power seat control module using the Subaru Select Monitor.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2604 displayed? (Current malfunction)

Yes

Replace the power seat control module.  [Ref. to SEATS>Power Seat System.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

POWER SEAT MEMORY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2605 BATTERY CONTROL LOW

DTC detecting condition:

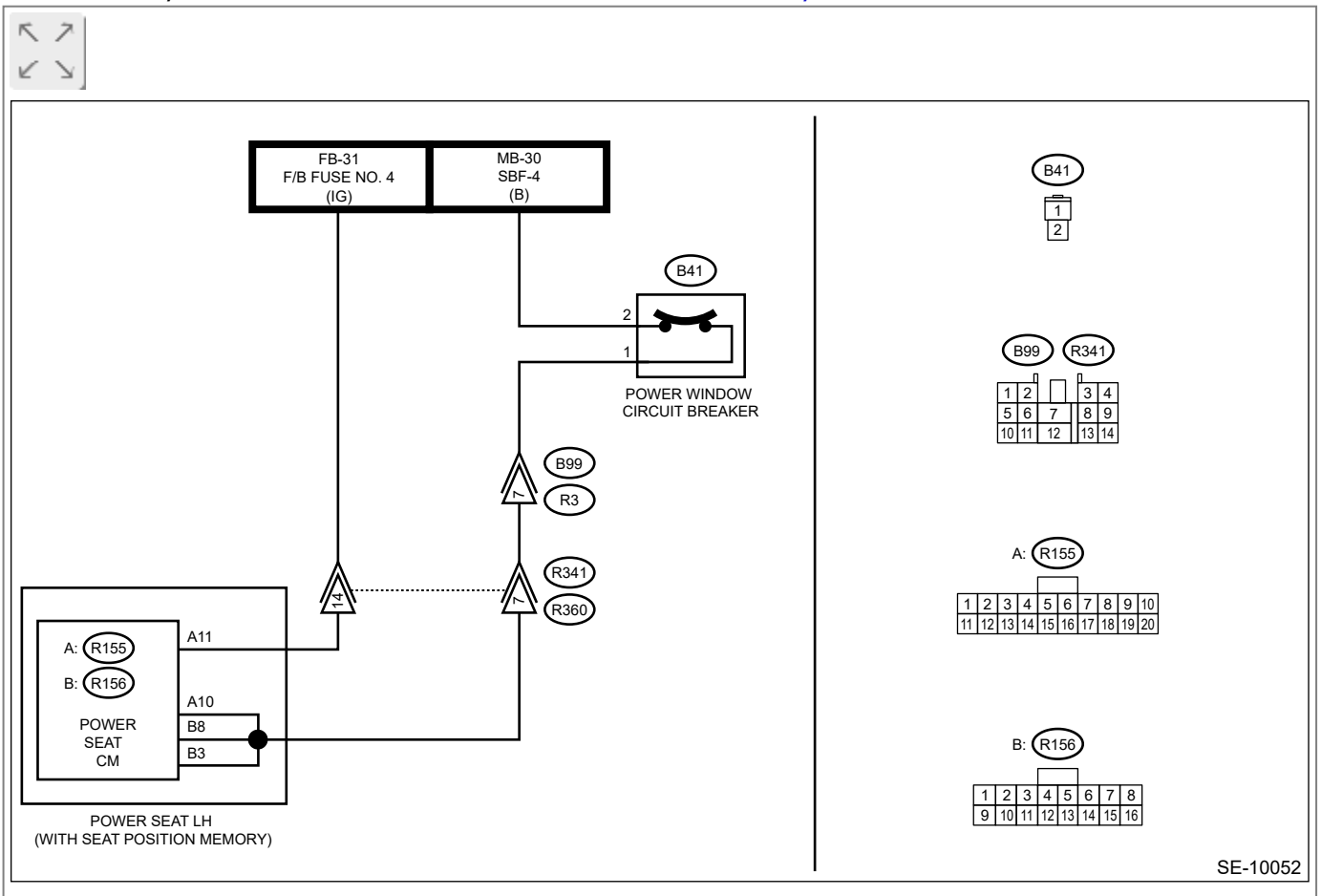
During the motor operation, voltage for power seat control module drops for a moment. (7.5 V or less)

Trouble symptom:


- Seat positions cannot be memorized.
- Seat operation is possible with manual operation, but not with memory function.

Wiring diagram:

Power seat system  [Ref. to WIRING SYSTEM>Power Seat System>WIRING DIAGRAM.](#)




1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of the power seat control module using the Subaru Select Monitor.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2605 displayed? (Current malfunction)

Yes

 [Go to 2.](#)



No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK DTC.

1. Perform the clear memory operation.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Clear memory.](#)
2. Turn the ignition switch to OFF.
3. Disconnect, and then connect the power seat control module connector.
4. Turn the ignition switch to ON.
5. Move the power seat.
6. Read the DTC of the power seat control module using the Subaru Select Monitor.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2605 displayed? (Current malfunction)


Yes

 [Go to 3.](#)

No


Repair or replace the poor contact of connector.

3. CHECK POWER SEAT CONTROL MODULE.

Check the display of data monitor [Battery Terminal Voltage] of power seat control module using the Subaru Select Monitor.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Data Monitor.](#)

Is the voltage 8.5 — 16.5 V?

Yes

 [Go to 5.](#)

No

 [Go to 4.](#)

4. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.


2. Disconnect the power seat control module connector.
3. Turn the ignition switch to ON.
4. Using the tester, measure the voltage between power seat control module connector and chassis ground.

Connector & terminal

- (R155) No. 10 (+) — Chassis ground (-):
- (R155) No. 11 (+) — Chassis ground (-):
- (R156) No. 3 (+) — Chassis ground (-):
- (R156) No. 8 (+) — Chassis ground (-):

Is the voltage 8.5 — 16.5 V?

Yes

Replace the power seat control module.  [Ref. to SEATS>Power Seat System.](#)

No

Repair the open circuit in harness between power seat control module connector and fuse.

5. CHECK BATTERY VOLTAGE.



Measure the battery voltage while the power seat is in operation.

Is the voltage 8.5 — 16.5 V?



Yes

Ask the user if the power window or passenger's power seat was operated or cranking was performed while the driver's power seat is in operation.

Note:

Even when the battery voltage is normal under ordinary circumstance, the voltage may drop to 7.5 V or less in some cases, for example at cranking.

No

Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DOTC\)>General Description.](#)  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)

POWER SEAT MEMORY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2606 POWER SEAT POSITION SENSOR CIRCUIT LOW

DTC detecting condition:

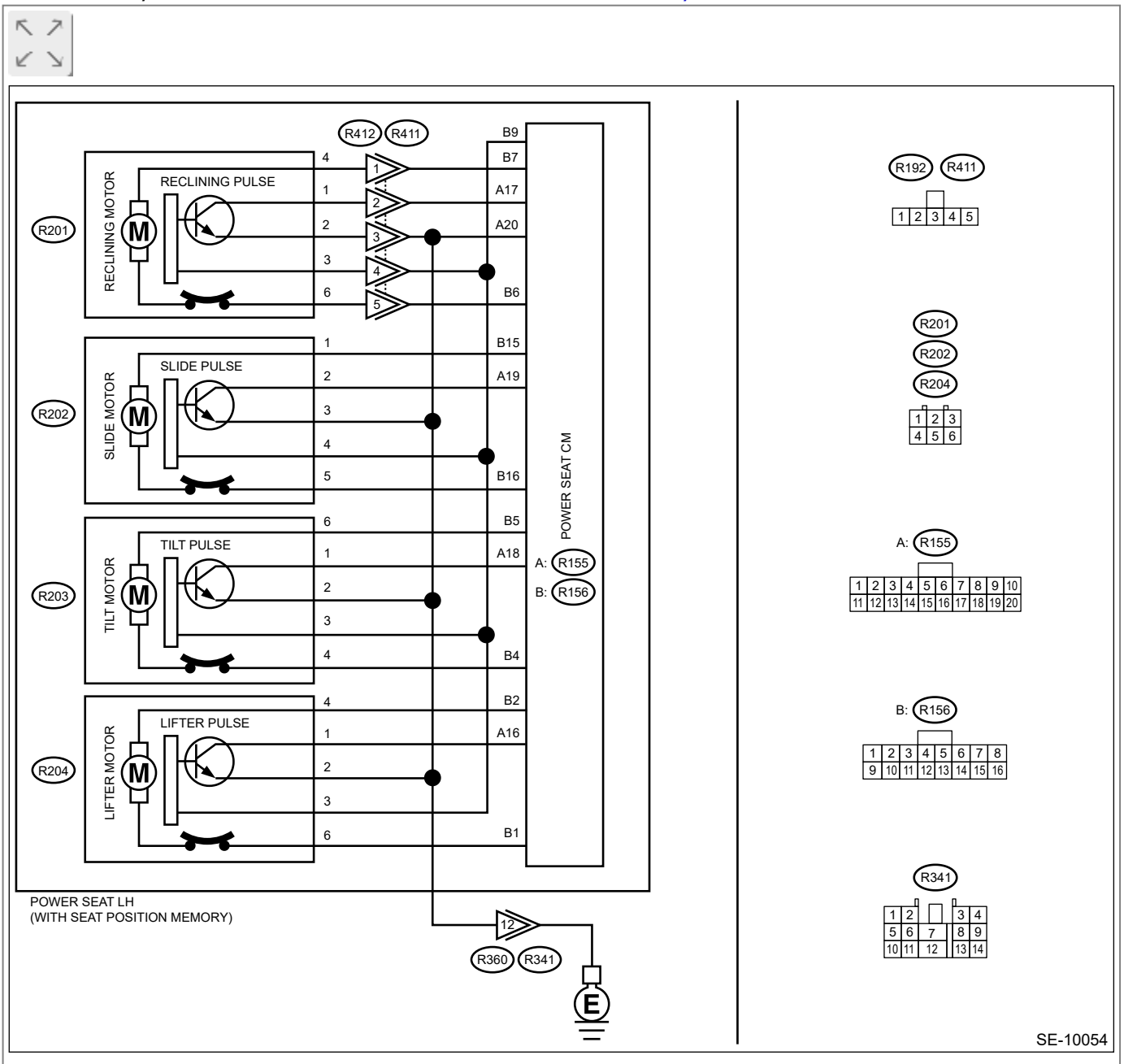
Short circuit in the pulse sensor is detected during the motor operation for a certain period of time (12 ms) or more.

Trouble symptom:



- Seat memory does not operate.
- Seat operation stops immediately after manual operation is performed.

Wiring diagram:

Power seat system  [Ref. to WIRING SYSTEM>Power Seat System>WIRING DIAGRAM.](#)




1. CHECK DTC.

1. Perform the clear memory operation.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Clear memory.](#)
2. Turn the ignition switch to OFF.
3. Disconnect, and then connect the power seat control module connector.
4. Turn the ignition switch to ON.
5. Move the power seat.
6. Read the DTC of the power seat control module using the Subaru Select Monitor.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2606 displayed? (Current malfunction)

Yes

 [Go to 2.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS (GROUND SHORT CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the power seat control module connector.
3. Disconnect the connectors of all motors (slide/tilt/lifter/reclining).
4. Using the tester, measure the resistance between power seat control module connector and chassis ground.

Connector & terminal

(R156) No. 9 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 3.](#)

No

Repair or replace the short circuit to ground in harness between power seat control module connector and motor connector.

3. CHECK SLIDE MOTOR.

1. Connect the slide motor connector.


- Using the tester, measure the resistance between power seat control module connector and chassis ground.

Connector & terminal


(R156) No. 9 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 4.](#)

No

Replace the seat cushion frame assembly.  [Ref. to SEATS>Front Seat>DISASSEMBLY > POWER SEAT \(DRIVER'S SEAT\).](#)

4. CHECK TILT MOTOR.


- Disconnect the slide motor connector.
- Connect the tilt motor connector.
- Using the tester, measure the resistance between power seat control module connector and chassis ground.

Connector & terminal


(R156) No. 9 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 5.](#)

No

Replace the seat cushion frame assembly.  [Ref. to SEATS>Front Seat>DISASSEMBLY > POWER SEAT \(DRIVER'S SEAT\).](#)

5. CHECK LIFTER MOTOR.

- Disconnect the tilt motor connector.
- Connect the lifter motor connector.
- Using the tester, measure the resistance between power seat control module connector and chassis ground.

Connector & terminal


(R156) No. 9 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 6.](#)

No

Replace the seat cushion frame assembly.  [Ref. to SEATS>Front](#)

6. CHECK RECLINING MOTOR.




1. Disconnect the lifter motor connector.
2. Connect the reclining motor connector.
3. Using the tester, measure the resistance between power seat control module connector and chassis ground.

Connector & terminal


(R156) No. 9 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

Replace the power seat control module.  [Ref. to SEATS>Power Seat System.](#)

No


Replace the backrest frame assembly.  [Ref. to SEATS>Front Seat>DISASSEMBLY > POWER SEAT \(DRIVER'S SEAT\).](#)

POWER SEAT MEMORY(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION


1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Power Seat Memory], and then select [Enter].
5. On [Select Function] display, select [DTC].

Note:

- For operation procedures, refer to "Application help".
- For details concerning DTC, refer to the [List of Diagnostic Trouble Codes \(DTC\)](#).  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\)](#).

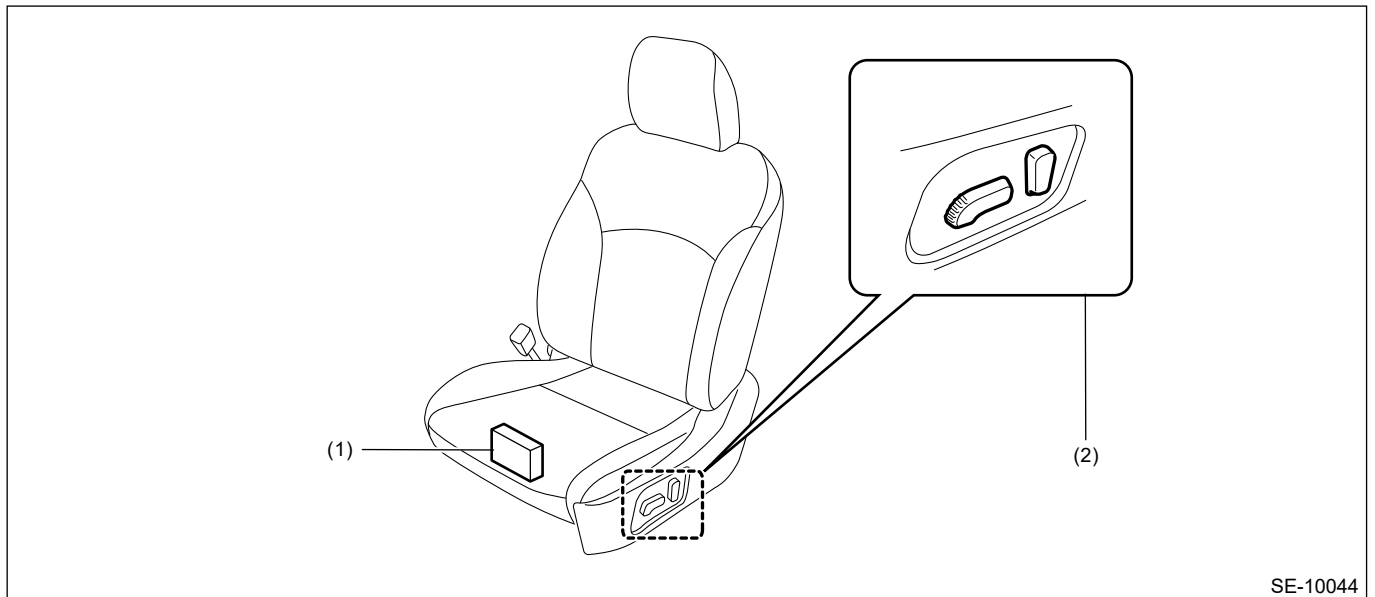
POWER SEAT MEMORY(DIAGNOSTICS) > Diagnostics with Phenomenon

INSPECTION

Refer to "TROUBLE SYMPTOM" for the power seat system.  [Ref. to SEATS>Power Seat System.](#)

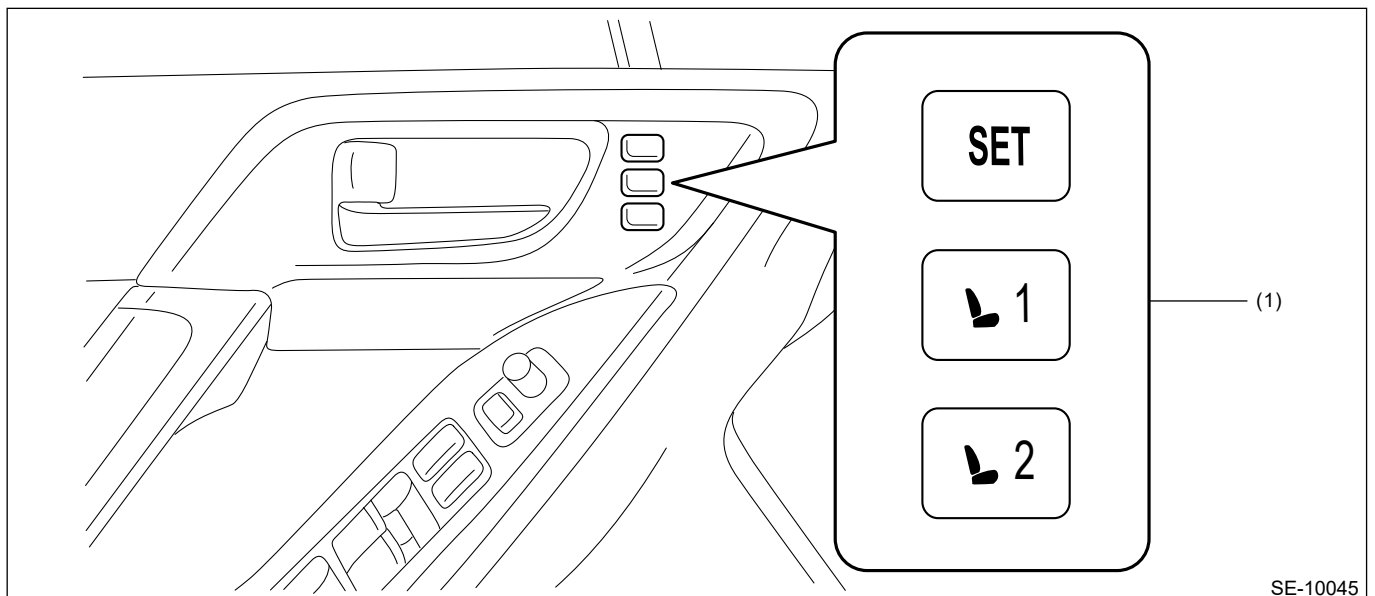
POWER SEAT MEMORY(DIAGNOSTICS) > Electrical Component Location

LOCATION



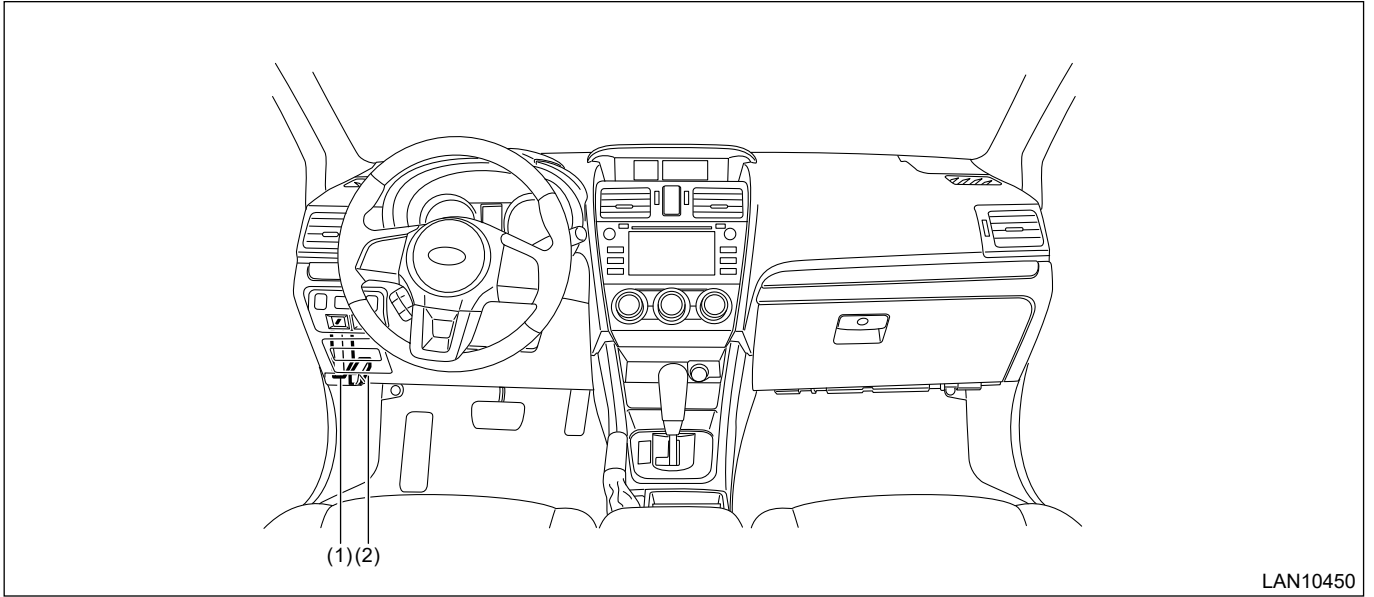
SE-10044

- (1) Power seat control module (2) Power seat switch



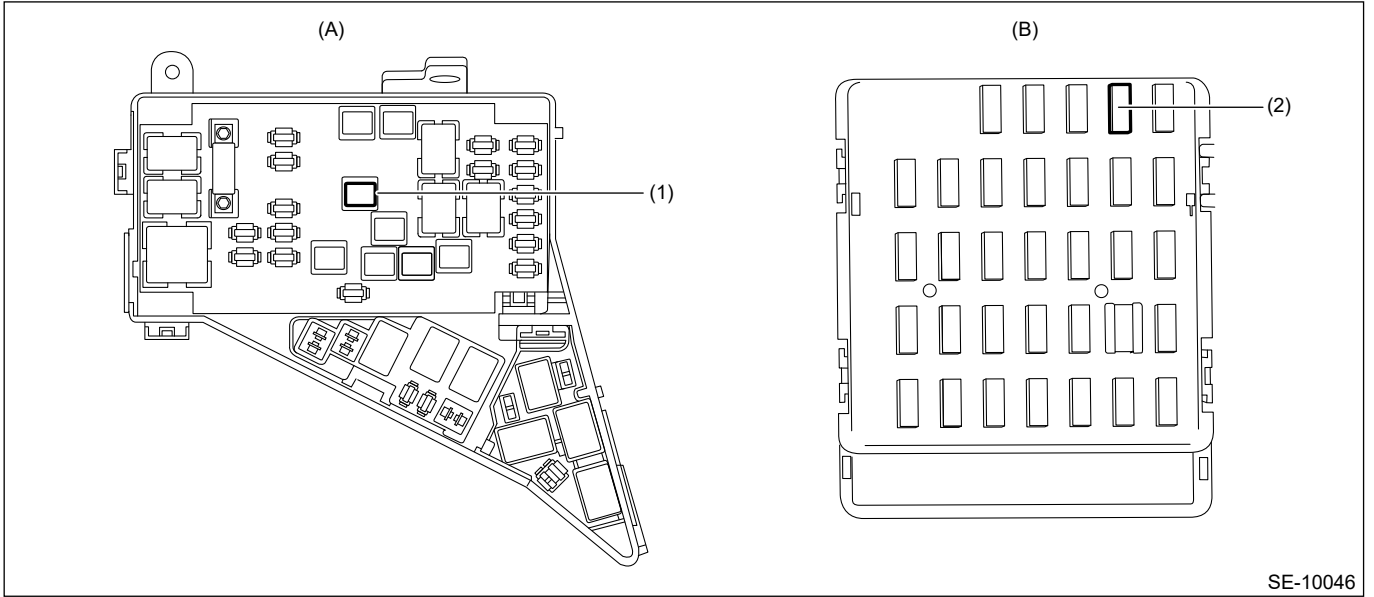
SE-10045

- (1) Seat memory switch



LAN10450

(1) Body integrated unit (2) Data link connector



SE-10046

(A) Engine compartment fuse box (B) Interior fuse & relay box
 (1) Fuse (30A) (2) Fuse (10A)

POWER SEAT MEMORY(DIAGNOSTICS) > Freeze Frame Data

LIST

Display	Content	Note
Battery Terminal Voltage	Battery voltage is displayed.	—
Slide Output	Power seat control module output status is displayed. (Slide motor)	—
Reclining Output	Power seat control module output status is displayed. (Reclining motor)	—
Lifter Output	Power seat control module output status is displayed. (Lifter motor)	—
Tilt Output	Power seat control module output status is displayed. (Tilt motor)	—

POWER SEAT MEMORY(DIAGNOSTICS) > Freeze Frame Data

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Power Seat Memory], and then select [Enter].
5. On [Select Function] display, select [DTC].
6. On [DTC] display, select [FFD].

Note:

For detailed operation procedures, refer to "Application help".

POWER SEAT MEMORY(DIAGNOSTICS) > General Description

CAUTION

1. AIRBAG SYSTEM

Caution:

- Do not use the electrical test equipment on the airbag system wiring harnesses and connector circuits.
- Be careful not to damage the airbag system wiring harness.

2. POWER SEAT MEMORY SYSTEM

Caution:



- During inspection of the power seat memory system, be careful not to catch objects in.
- Perform communication with Subaru Select Monitor with IG ON.
(With IG OFF, communication cannot be established between the body integrated unit – seat memory CM.)

POWER SEAT MEMORY(DIAGNOSTICS) > General Description

INSPECTION

1. BASIC INSPECTION


Before performing diagnosis, check the following items which might affect the problems related to power seat memory system.

- 1.** Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DOTC\)>General Description.](#)  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery.](#)
- 2.** Check the relay and fuse condition.
- 3.** Check the connecting condition of harness and harness connector.

POWER SEAT MEMORY(DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	— (Newly adopted tool)	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

POWER SEAT MEMORY(DIAGNOSTICS) > Inspection Mode




PROCEDURE

It is possible to diagnose the DTC by performing the indicated inspection mode. After correcting the DTC, perform a necessary inspection mode and make sure that the function is resumed correctly and the DTC is recorded.

1. INSPECTION MODE 1

DTC	Item	Note
B2600	LIN COMMUNICATION	—
B2601	LIN CIRCUIT LOW	—
B2602	VEHICLE SPEED CONTROL	—
B2603	EPB CONTROL	—
B2605	BATTERY CONTROL LOW	—

Diagnostic procedure:

1. Clear the memory.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Clear memory.](#)
2. Read the DTC and check that the DTC is not displayed.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)
3. Turn the ignition switch ON → OFF, and wait for 45 seconds or more.
4. Turn the ignition switch OFF → ON, and wait for 5 seconds or more.
5. Read the DTC and check that the DTC is not displayed.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)





Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

2. INSPECTION MODE 2

DTC	Item	Note
B2604	POWER SEAT MEMORY EEPROM	—

Diagnostic procedure:

1. Clear the memory.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Clear memory.](#)
2. Read the DTC and check that the DTC is not displayed.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)
3. Initialize the power seat system.  [Ref. to SEATS>Power Seat System.](#)
4. Turn the ignition switch ON → OFF, and wait for 45 seconds or more.
5. Turn the ignition switch OFF → ON, and wait for 5 seconds or more.
6. Read the DTC and check that the DTC is not displayed.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Note:




If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

3. INSPECTION MODE 3

--	--	--

DTC	Item	Note
B2606	POWER SEAT POSITION SENSOR CIRCUIT LOW	—

Diagnostic procedure:








1. Clear the memory.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Clear memory.](#)
2. Read the DTC and check that the DTC is not displayed.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)
3. Operate the power seat switch. (Any of slide/reclining/lifter/tilt)
4. Turn the ignition switch ON → OFF, and wait for 45 seconds or more.
5. Turn the ignition switch OFF → ON, and wait for 5 seconds or more.
6. Read the DTC and check that the DTC is not displayed.  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

POWER SEAT MEMORY(DIAGNOSTICS) > List of Diagnostic Trouble Code (DTC)

LIST

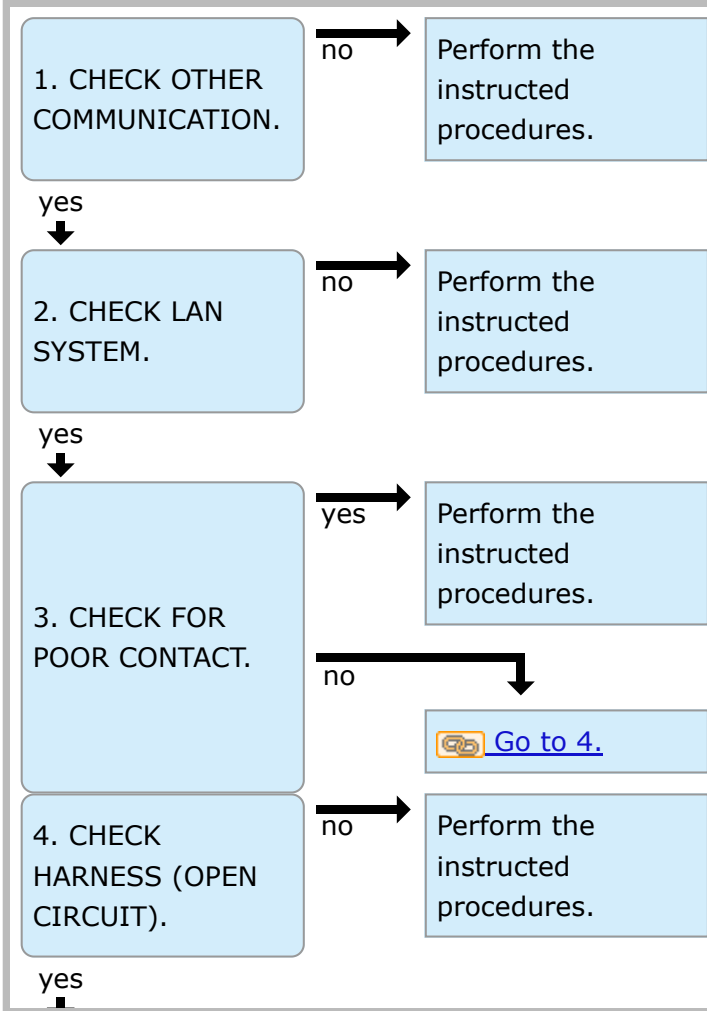
DTC	Item	Reference
B2600	B2600LIN COMMUNICATION	 Ref. to POWER SEAT MEMORY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2600 LIN COMMUNICATION .
B2601	LIN CIRCUIT LOW	 Ref. to POWER SEAT MEMORY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2601 LIN CIRCUIT LOW.
B2602	VEHICLE SPEED CONTROL	 Ref. to POWER SEAT MEMORY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2602 VEHICLE SPEED CONTROL.
B2603	EPB CONTROL	 Ref. to POWER SEAT MEMORY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2603 EPB CONTROL.
B2604	POWER SEAT MEMORY EEPROM	 Ref. to POWER SEAT MEMORY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2604 POWER SEAT MEMORY EEPROM.
B2605	BATTERY CONTROL LOW	 Ref. to POWER SEAT MEMORY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2605 BATTERY CONTROL LOW.
B2606	POWER SEAT POSITION SENSOR CIRCUIT LOW	 Ref. to POWER SEAT MEMORY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2606 POWER SEAT POSITION SENSOR CIRCUIT LOW.

POWER SEAT MEMORY(DIAGNOSTICS) > Subaru Select Monitor

INSPECTION

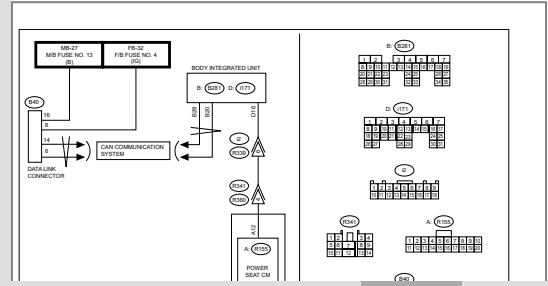
CAUTION/NOTE

INTRO



Wiring diagram:

Power seat system Ref. to [WIRING SYSTEM](#)
[Seat System](#)>[WIRING DIAGRAM.](#)




Note:

If the communication with the body unit is not possible either, refer to [CONTROL SYSTEM \(DIAGNOSTICS\)](#)
[LAN SYSTEM \(DIAGNOSTICS\)](#)>[Subaru Select Monitor](#)>[COMMUNICATION FOR IMPOSSIBLE.](#)

START

POWER SEAT MEMORY(DIAGNOSTICS) > Subaru Select Monitor

OPERATION

- For detailed operation procedures, refer to "Application help".
- When communication with Subaru Select Monitor is not possible, perform "COMMUNICATION FOR INITIALIZING IMPOSSIBLE".  [Ref. to POWER SEAT MEMORY\(DIAGNOSTICS\)>Subaru Select Monitor>INSPECTION.](#)

POWER STEERING (DIAGNOSTICS) > Basic Diagnostic Procedure

PROCEDURE




Caution:

- **The power steering control module continues to operate after the engine stops and calculate the temperature in the control module. Therefore, before starting service of the power steering system which requires disconnection of the connector, stop the engine and allow approx. 10 minutes until the control module becomes cold.**
- **Before removal or installation, be sure to remove any foreign matter (dust, moisture, oil, etc.) from the power steering control module connector.**

Note:

- **Shake the connector at the suspected trouble location to check for open or short circuits of the harness.**
- **Refer to “Check List for Interview”.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Check List for Interview.](#)**

1. CHECK PRE-INSPECTION.

1. Ask the customer when and how the trouble occurred using the interview check list.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Check List for Interview.](#)
2. Check the illumination status of the STEERING warning light while the engine is running.
3. Before performing diagnostics, check components which might affect power steering problems.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>General Description>INSPECTION.](#)
4. Save the data of [Overheating protection intervention history], [IGN count from overheating protection (most recent)], [IG Count after ECU Overheat Protection(Previous)], [IG Count after ECU Overheat Protection(Before Previous)] and Assist limit history (low voltage, high voltage) using Subaru Select Monitor.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Subaru Select Monitor>OPERATION > DATA MONITOR.](#)

Is the check result OK?

Yes


 [Go to 2.](#)

No


Repair or replace each component.

2. CHECK INDICATION OF DTC.

1. Turn the ignition switch to OFF.


2. Connect the Subaru Select Monitor to data link connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Read the DTC using the Subaru Select Monitor.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Subaru Select Monitor.](#)

Note:


If the communication function of the Subaru Select Monitor cannot be executed properly, check the communication circuit.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Subaru Select Monitor>INSPECTION > COMMUNICATION FOR INITIALIZING IMPOSSIBLE.](#)

Is DTC displayed?

Yes

Record the DTC, time stamp and freeze frame data.  [Go to 4.](#)




Note:

- **For the time stamp, refer to LAN section.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>General Description>CAUTION > TIME STAMP.](#)**
- **Depending on DTCs, time stamp may not be stored.**

No

 [Go to 3.](#)

3. PERFORM GENERAL DIAGNOSTICS.


1. If the STEERING warning light is illuminated while the engine is running, clear the memory.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Clear memory.](#)
2. Perform the Inspection Mode.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Inspection Mode.](#)
3. Read the DTC.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)
4. Check that the DTC is not displayed.

Does the STEERING warning light illuminate at ignition switch ON, and turn off two seconds after the engine is started?


Yes

Finish the diagnosis.




No

 [Ref. to POWER STEERING \(DIAGNOSTICS\)>Subaru Select Monitor>INSPECTION > WITHOUT DTC.](#)

4. PERFORM DIAGNOSIS.

1. Refer to "List of Diagnostic Trouble Code (DTC)".  [Ref. to POWER STEERING](#)

[\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

- 2.** Correct the cause of trouble.
- 3.** Check the illumination status of the STEERING warning light while the engine is running, and if the warning light is lit, clear the memory.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Clear memory.](#)
- 4.** Perform the Inspection Mode.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Inspection Mode.](#)
- 5.** Read the DTC.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is DTC displayed?

Yes

Repeat step 4 until DTC is not shown.

No

Finish the diagnosis.

POWER STEERING (DIAGNOSTICS) > Check List for Interview

CHECK

Check the following items regarding condition of the vehicle.

1. TROUBLE STATUS



Phenomenon of the vehicle	<input type="checkbox"/> Steering is heavy <input type="checkbox"/> Steering is not smooth <input type="checkbox"/> Steering is unstable (wondering) <input type="checkbox"/> Steering does not return to center <input type="checkbox"/> Steering is not straight
	<input type="checkbox"/> Steering force required is not the same for right and left turn <input type="checkbox"/> Steering force required is not even <input type="checkbox"/> Steering is too light
	<input type="checkbox"/> Noise <input type="checkbox"/> Vibration <input type="checkbox"/> STEERING warning light illuminates <input type="checkbox"/> Other
Frequency	<input type="checkbox"/> Always <input type="checkbox"/> Sometimes <input type="checkbox"/> Immediately after starting the engine <input type="checkbox"/> Only once <input type="checkbox"/> Other
	<input type="checkbox"/> Recovers after leaving it for minutes
Steering wheel operation	<input type="checkbox"/> Dry steering <input type="checkbox"/> When turning <input type="checkbox"/> Quick steering <input type="checkbox"/> Slow steering <input type="checkbox"/> Returning the steering wheel
	<input type="checkbox"/> Releasing the steering wheel <input type="checkbox"/> Only supporting the steering wheel by hand <input type="checkbox"/> Repetitive dry steering
Steering wheel status / direction	<input type="checkbox"/> Around center position <input type="checkbox"/> Near end of lock to lock
	<input type="checkbox"/> When turning the steering to right <input type="checkbox"/> When turning the steering to left <input type="checkbox"/> Both to right and to left <input type="checkbox"/> (1) Steering angle: degrees <input type="checkbox"/> (2) Maneuvering time: minutes
	<input type="checkbox"/> Slow steering <input type="checkbox"/> Quick steering <input type="checkbox"/> While holding the steering <input type="checkbox"/> When repeating the dry wheel operation

Vehicle speed	<input type="checkbox"/> Stall 0 km/h (0 MPH) <input type="checkbox"/> Very low speed — 20 km/h (— 12 MPH) <input type="checkbox"/> Low speed — 40 km/h (— 25 MPH) <input type="checkbox"/> Medium speed — 80 km/h (— 50 MPH) <input type="checkbox"/> High speed — 80 km/h or more (— 50 MPH or more)
	<input type="checkbox"/> At starting <input type="checkbox"/> While accelerating <input type="checkbox"/> While decelerating <input type="checkbox"/> When accelerating rapidly <input type="checkbox"/> When decelerating rapidly
	<input type="checkbox"/> Other
Engine speed	<input type="checkbox"/> Idling <input type="checkbox"/> (1) Around rpm <input type="checkbox"/> (2) rpm— rpm <input type="checkbox"/> (3) rpm or more • or less

2. STATE OF STEERING WARNING LIGHT



STEERING warning light illuminates	<input type="checkbox"/> Always <input type="checkbox"/> Sometimes <input type="checkbox"/> Only once <input type="checkbox"/> Does not illuminate <input type="checkbox"/> Other
Ignition key position	<input type="checkbox"/> LOOK <input type="checkbox"/> ACC <input type="checkbox"/> ON (when starting engine) <input type="checkbox"/> START <input type="checkbox"/> ON (when starting engine, while engine is running) <input type="checkbox"/> ON (when starting engine, when engine is at a standstill)
Timing	<input type="checkbox"/> Immediately after turning the ignition ON <input type="checkbox"/> Immediately after turning the ignition to START
	<input type="checkbox"/> Idling <input type="checkbox"/> While accelerating <input type="checkbox"/> While decelerating <input type="checkbox"/> When cruising at — km/h (MPH)
	<input type="checkbox"/> When other electronic parts is in operation (part name: _____ operation condition: _____)

3. ENVIRONMENT



a) Weather	<input type="checkbox"/> Fine <input type="checkbox"/> Cloudy <input type="checkbox"/> Rainy
------------	--

	<input type="checkbox"/> Snowy <input type="checkbox"/> Others:
b) Outside temperature	<input type="checkbox"/> °C (°F)
c) Road	<input type="checkbox"/> Inner city <input type="checkbox"/> Suburbs <input type="checkbox"/> Highway <input type="checkbox"/> Local street <input type="checkbox"/> Alley way <input type="checkbox"/> Private road <input type="checkbox"/> Parking lot <input type="checkbox"/> Mountain road <input type="checkbox"/> Paved road <input type="checkbox"/> Unpaved road <input type="checkbox"/> Gravel road <input type="checkbox"/> Sandy place <input type="checkbox"/> Muddy road <input type="checkbox"/> Concrete road <input type="checkbox"/> Stone pavement <input type="checkbox"/> Racetrack <input type="checkbox"/> Others:
d) Road surface	<input type="checkbox"/> Dry <input type="checkbox"/> Wet <input type="checkbox"/> Covered with fresh snow <input type="checkbox"/> Covered with hardened snow <input type="checkbox"/> Others:
e) Tire	<input type="checkbox"/> Tire chain <input type="checkbox"/> Studless tire <input type="checkbox"/> T-type tire (front RH • front LH • rear RH • rear LH)
f) Tire inflation pressure	Front RH: kPa Front LH: kPa Rear RH: kPa Rear LH: kPa
g) Degree of wear	Front RH: mm (in) Front LH: mm (in) Rear RH: mm (in) Rear LH: mm (in)
h) Genuine part	<input type="checkbox"/> Yes <input type="checkbox"/> No Record after-market parts if any. (Steering wheel, audio, tires, and similar parts)
i) Condition of suspension alignment	
j) Electrical load conditions	<input type="checkbox"/> Audio <input type="checkbox"/> Air conditioner <input type="checkbox"/> Other
k) Loaded state	Condition:
l) Repair parts	<input type="checkbox"/> None <input type="checkbox"/> Provided Contents:

m) Others	
-----------	--

POWER STEERING (DIAGNOSTICS) > Clear memory

OPERATION

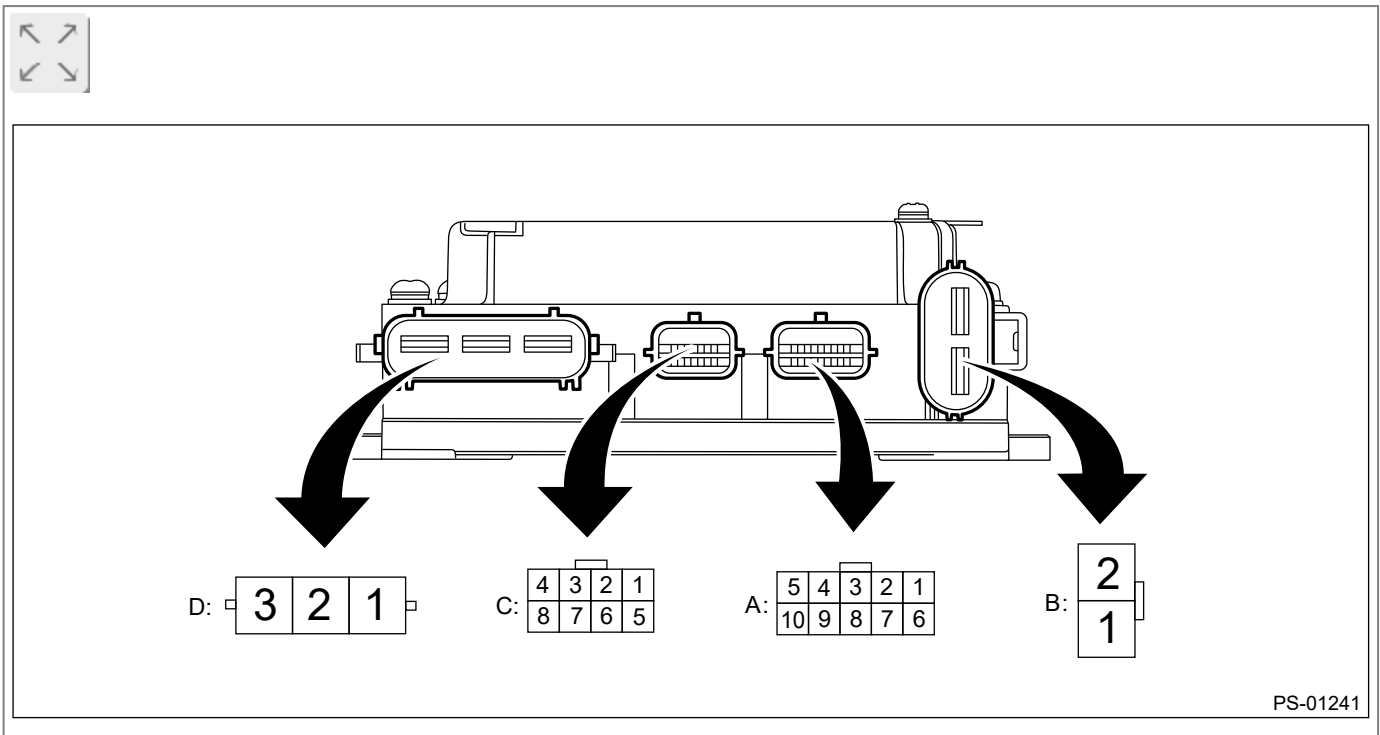
- 1.** On [Start] display, select [Diagnosis].
- 2.** On [Vehicle selection] display, enter vehicle information and select [OK].
- 3.** On [Main Menu] display, select [Each System].
- 4.** On [Select System] display, select [Power Steering].
- 5.** On [Select Function] display, select [DTC].
- 6.** On [DTC] display, select [Clear memory].

Note:

For detailed operation procedures, refer to “Application help”.

POWER STEERING (DIAGNOSTICS) > Control Module I/O Signal

ELECTRICAL SPECIFICATION



Note:

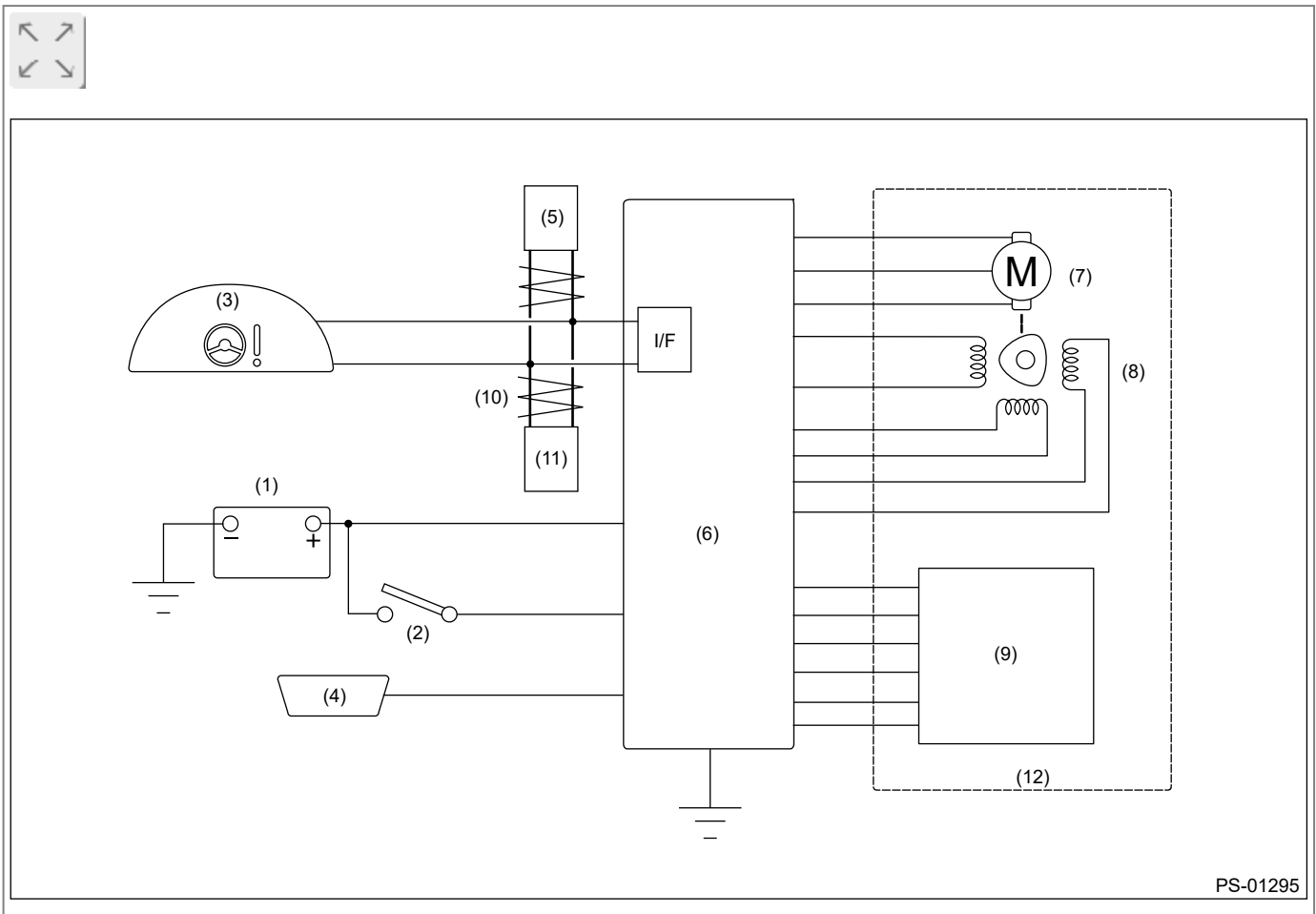
The terminal numbers of the power steering control module connectors are as indicated in the figure.

Description	Terminal No.	Input/output signal
		Measured value and measuring conditions
Power supply (IG SW)	A1	Battery voltage is detected with the ignition switch ON when measuring between A1 — B1.
Shield GND	A3	0 V is constantly detected.
Main torque sensor	A4	The voltage changes when the steering is operated to the right or left with the ignition switch ON.
Sub torque sensor	A5	The voltage changes when the steering is operated to the right or left with the ignition switch ON.
CAN communication	A6	Digital signal; can not be measured
CAN communication	A7	Digital signal; can not be measured
Torque sensor operating power supply	A8	Approximately 8 V is detected with ignition switch ON.
Torque sensor ground	A9	0 V is constantly detected.
Torque sensor standard power supply	A10	Approximately 3 V is detected with ignition switch ON.
Ground	B1	Battery voltage is constantly detected when measuring between B1 — B2.
Power supply	B2	

Resolver S1	C1	Varies depending on the operational status of the motor.
Resolver S3	C2	
Resolver S2	C3	
Resolver S4	C4	
Excitation power supply for resolver	C5	
Common output	C6	
Motor U phase	D1	Varies depending on the motor output.
Motor V phase	D2	
Motor W phase	D3	

POWER STEERING (DIAGNOSTICS) > Control Module I/O Signal

WIRING DIAGRAM



PS-01295

- | | | |
|--|-----------------------------------|--------------------------------|
| (1) Battery | (5) Engine control module (ECM) | (9) Torque sensor (main & sub) |
| (2) Ignition switch | (6) Power steering control module | (10) CAN communication |
| (3) STEERING warning light
(combination meter) | (7) Motor | (11) VDC CM |
| (4) Data link connector (for
Subaru Select Monitor) | (8) Resolver sensor | (12) Steering gearbox |

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

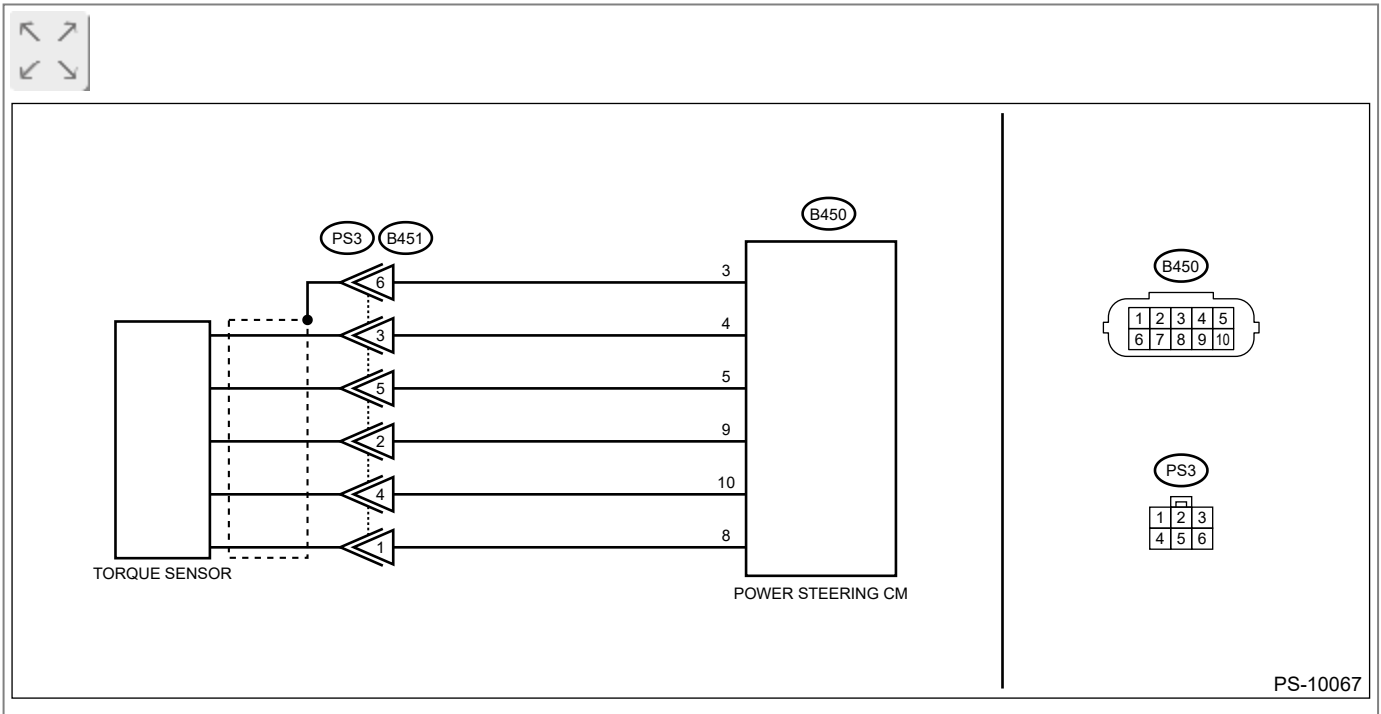
DTC C2511 TORQUE SENSOR MAIN

Trouble symptom:

- The steering wheel operation feels heavy.
- STEERING warning light illuminates.

Wiring diagram:

Electric power steering system  [Ref. to WIRING SYSTEM>Electric Power Steering System.](#)



1. CHECK TORQUE SENSOR SIGNAL.


1. Using the Subaru Select Monitor, display the data monitor of the power steering control module.
2. Check the voltage of [Torque sensor main output], [Torque sensor sub output], [Torque sensor reference voltage] and [Torque Sensor Power Supply].

Are the voltages of [Torque sensor main output] and [Torque sensor sub output] 2.5 ± 0.1 V?

Is the voltage of [Torque sensor reference voltage] 3 ± 0.1 V?

Is the voltage of [Torque Sensor Power Supply] 8 ± 0.4 V?

Yes

Check for poor contact of the connector, and check the conditions again. If the condition recur, go to the next step.  [Go to 2.](#)

If it does not recur, complete the inspection.

No

 [Go to 2.](#)

2. CHECK HARNESS.



1. Turn the ignition switch to OFF.
2. Disconnect the connectors (B450, B451).
3. Using a tester and test harness, check the internal resistance of the harness terminals.

Connector & terminal

- (B450) No. 4 — (B451) No. 3:
- (B450) No. 5 — (B451) No. 5:
- (B450) No. 8 — (B451) No. 1:
- (B450) No. 9 — (B451) No. 2:
- (B450) No. 10 — (B451) No. 4:

Is the resistance less than 10 Ω?

Yes

 [Go to 3.](#)

No

Repair or replace the harness.

3. CHECK POWER STEERING CONTROL MODULE.



1. Connect the connector (B450) to the power steering control module.
2. Turn the ignition switch to ON.
3. Short the circuit between connector (B451) terminals.


Terminals

- No. 4 — No. 3:
 - No. 4 — No. 5:
4. Check the voltage of [Torque sensor main output] and [Torque sensor sub output] using Subaru Select Monitor.


Is the voltage of [Torque sensor main output] and [Torque sensor sub output] each 0 ± 0.1 V before the circuit is shorted?

Is the voltage of [Torque sensor main output] and [Torque sensor sub output] each 3 ± 0.1 V after the circuit is shorted?

Yes

Replace the steering gearbox.  [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Electric Power Steering_Gearbox.](#)


No

Replace the power steering control module.  [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Power Steering Control Module.](#)

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2512 TORQUE SENSOR SUB


Note:

For the diagnostic procedures, refer to “DTC C2511 TORQUE SENSOR FAILURE 1 (MAIN)”.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC C2511 TORQUE SENSOR MAIN.](#)

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2513 TORQUE SENSOR MUCH TOLERANCE

Note:

For the diagnostic procedures, refer to “DTC C2511 TORQUE SENSOR FAILURE 1 (MAIN)”.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC C2511 TORQUE SENSOR MAIN.](#)

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

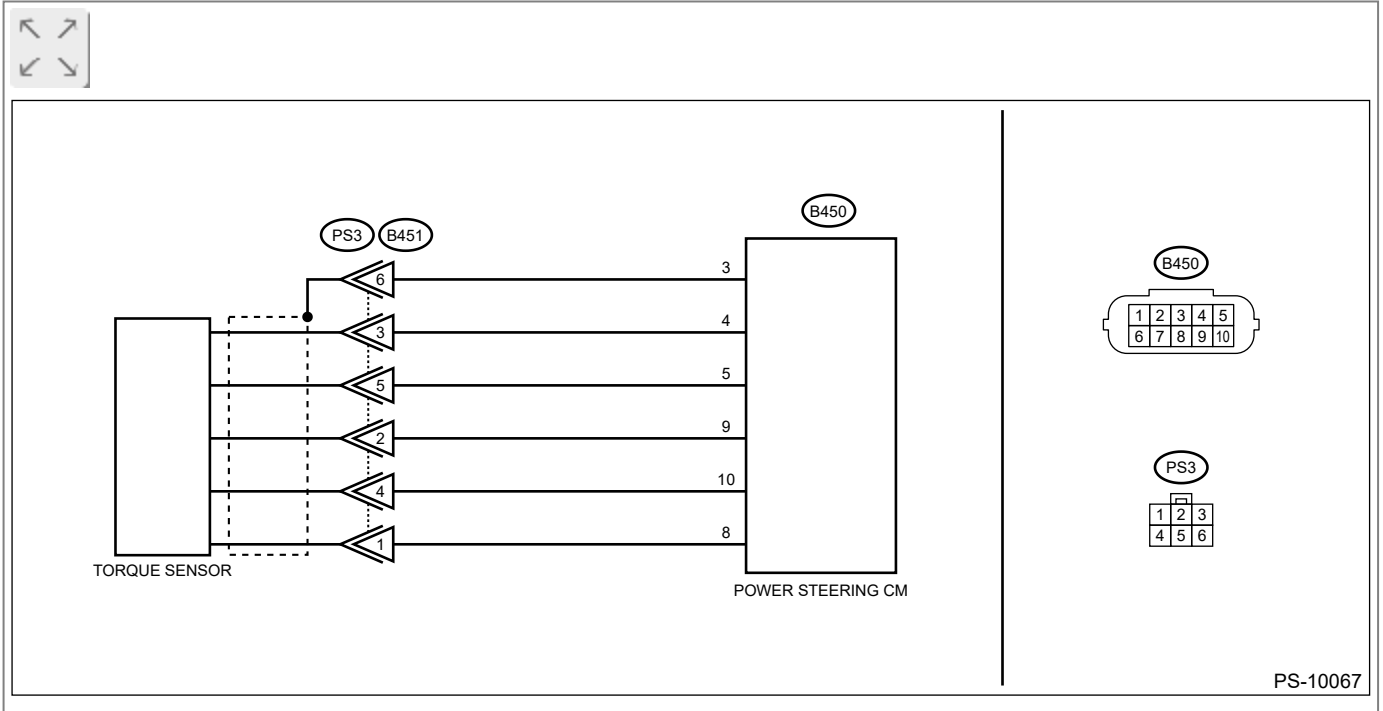
DTC C2514 TORQUE SENSOR POWER SUPPLY

Trouble symptom:

- The steering wheel operation feels heavy.
- STEERING warning light illuminates.

Wiring diagram:

Electric power steering system  [Ref. to WIRING SYSTEM>Electric Power Steering System.](#)



1. CHECK TORQUE SENSOR SIGNAL.


1. Using the Subaru Select Monitor, display the data monitor of the power steering control module.
2. Check the voltage of [Torque sensor main output], [Torque sensor sub output], [Torque sensor reference voltage] and [Torque Sensor Power Supply].

Are the voltages of [Torque sensor main output] and [Torque sensor sub output] 2.5 ± 0.1 V?

Is the voltage of [Torque sensor reference voltage] 3 ± 0.1 V?

Is the voltage of [Torque Sensor Power Supply] 8 ± 0.4 V?

Yes

Check for poor contact of the connector, and check the conditions again. If the condition recur, go to the next step.  [Go to 2.](#)

If it does not recur, complete the inspection.

No

 [Go to 2.](#)

2. CHECK HARNESS.




1. Turn the ignition switch to OFF.
2. Disconnect the connector (B451).
3. Using a tester and test harness, check the internal resistance of the harness terminals.

Connector & terminal

- (B450) No. 4 — (B451) No. 3:
- (B450) No. 5 — (B451) No. 5:
- (B450) No. 8 — (B451) No. 1:
- (B450) No. 9 — (B451) No. 2:
- (B450) No. 10 — (B451) No. 4:

Is the resistance less than 10 Ω ?

Yes

Replace the power steering control module.  [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Power Steering Control Module.](#)

No

Repair or replace the harness.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

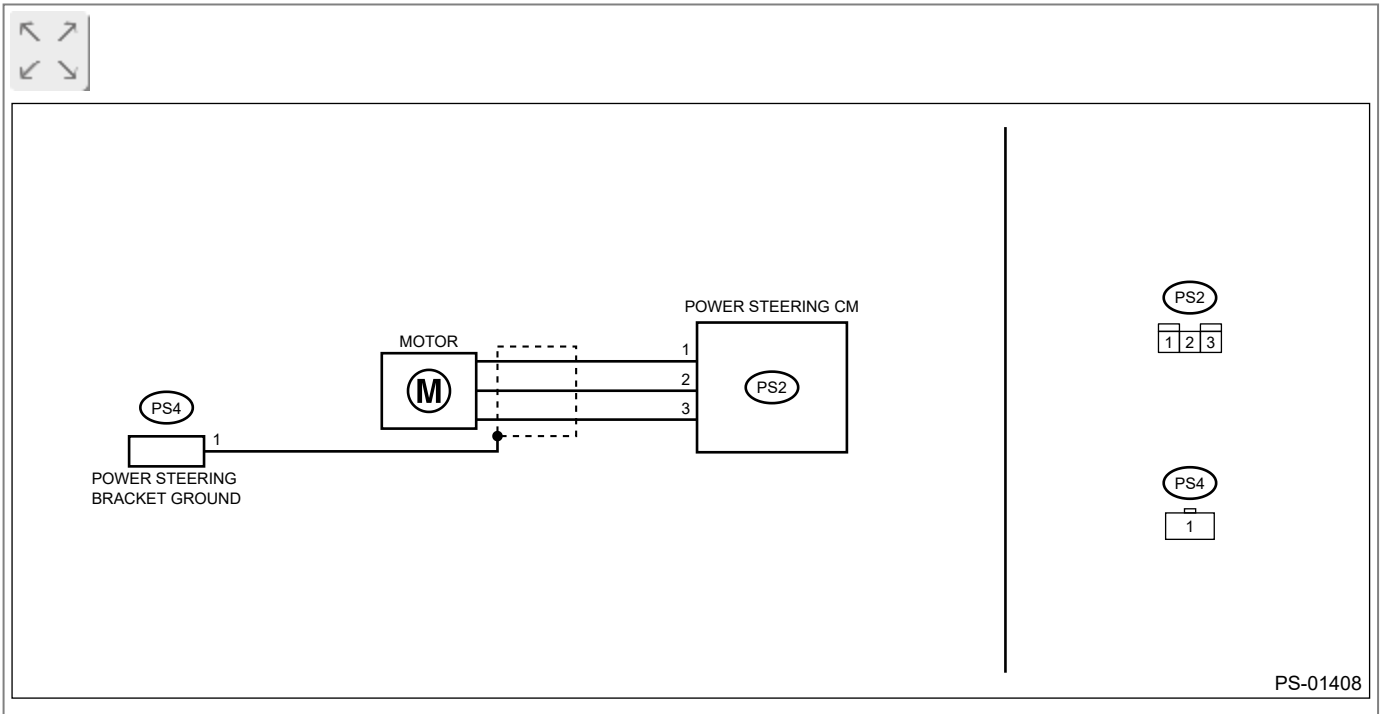
DTC C2521 MOTOR MALFUNCTION

Trouble symptom:

- The steering wheel operation feels heavy.
- STEERING warning light illuminates.

Wiring diagram:

Electric power steering system  [Ref. to WIRING SYSTEM>Electric Power Steering System.](#)



1. CHECK MOTOR UNIT.


1. Turn the ignition switch to OFF.
2. Disconnect the connector (PS2) from the power steering control module.
3. Use a tester to check for continuity in the motor.

Connector & terminal


- (PS2) No. 1 — No. 2:
- (PS2) No. 1 — No. 3:
- (PS2) No. 2 — No. 3:

Is there continuity?

Yes

 [Go to 2.](#)

No

Replace the steering gearbox.  [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Electric Power Steering Gearbox.](#)

2. CHECK MOTOR INSULATION.



Use a tester to check for short circuits in the motor.

Connector & terminal


(PS2) No. 1 — Steering gearbox body:

(PS2) No. 2 — Steering gearbox body:


(PS2) No. 3 — Steering gearbox body:

Is the resistance 1 M Ω or more?

Yes

Replace the power steering control module.  [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Power Steering Control Module.](#)

No

Replace the steering gearbox.  [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Electric Power Steering Gearbox.](#)

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

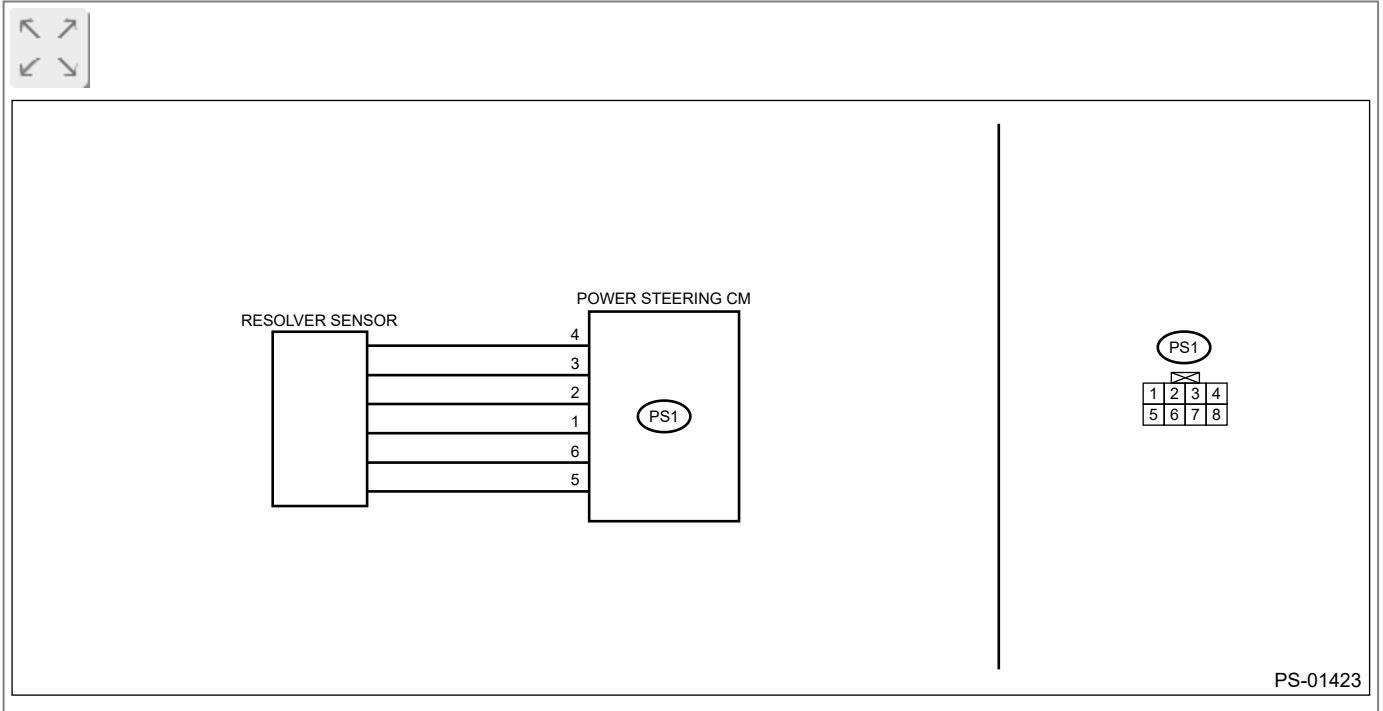
DTC C2522 RESOLVER SENSOR

Trouble symptom:

- The steering wheel operation feels heavy.
- STEERING warning light illuminates.

Wiring diagram:

Electric power steering system  [Ref. to WIRING SYSTEM>Electric Power Steering System.](#)



1. PERFORM UNIT CHECK OF RESOLVER SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector (PS1) from the power steering control module.
3. Use a tester to check for continuity in the resolver sensor.

Connector & terminal


(PS1) No. 1 — No. 2:

(PS1) No. 3 — No. 4:


(PS1) No. 5 — No. 6:

Is there continuity?

Yes

 [Go to 2.](#)

No

Replace the steering gearbox.  [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Electric Power Steering Gearbox.](#)

2. CHECK RESOLVER SENSOR INSULATION.



Using a tester, check for short circuits in the resolver sensor.

Connector & terminal

(PS1) No. 1 — Steering gearbox body:

(PS1) No. 2 — Steering gearbox body:

(PS1) No. 3 — Steering gearbox body:


(PS1) No. 4 — Steering gearbox body:

(PS1) No. 5 — Steering gearbox body:


(PS1) No. 6 — Steering gearbox body:

Is the resistance 1 MΩ or more?

Yes

Replace the power steering control module.  [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Power Steering Control Module.](#)

No

Replace the steering gearbox.  [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Electric Power Steering Gearbox.](#)


POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2531 CONTROL MODULE CPU

Trouble symptom:

- The steering wheel operation feels heavy.
- STEERING warning light illuminates.

Note:

When this code is displayed, replace the power steering control module with new parts.  Ref. to [POWER ASSISTED SYSTEM \(POWER STEERING\)>Power Steering Control Module.](#)

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

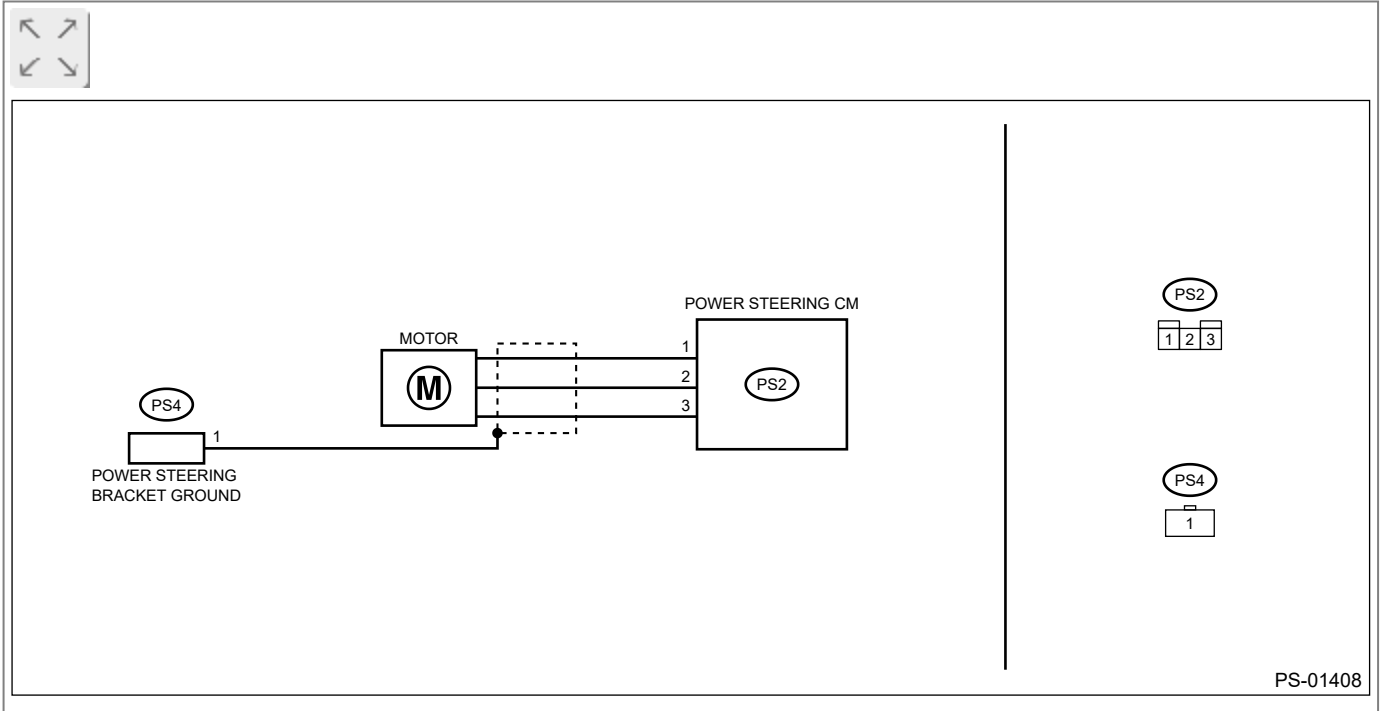
DTC C2532 CONTROL MODULE PERIPHERAL CIRCUIT

Trouble symptom:

- The steering wheel operation feels heavy.
- STEERING warning light illuminates.

Wiring diagram:

Electric power steering system  [Ref. to WIRING SYSTEM>Electric Power Steering System.](#)




1. CHECK CONNECTOR.

Check the connection status of the power steering control module and motor harness (PS2).

Is the connector firmly installed?

Yes

 [Go to 2.](#)

No


Install the connector, and check again.

2. CHECK CONNECTOR.


Check the appearance at connection of the power steering control module and motor harness (PS2).

Is the motor harness grommet coming out from the connector?

Yes

Replace the steering gearbox.  [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Electric Power Steering Gearbox.](#)

No

 [Go to 3.](#)

3. CHECK MOTOR UNIT.

1. Turn the ignition switch to OFF.
2. Disconnect the connector (PS2) from the power steering control module.
3. Use a tester to check for continuity in the motor.

Connector & terminal

(PS2) No. 1 — No. 2:

(PS2) No. 1 — No. 3:


(PS2) No. 2 — No. 3:

Is there continuity? (While wiggling the harness)

Yes

 [Go to 4.](#)

No

Replace the steering gearbox.  [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Electric Power Steering Gearbox.](#)

4. CHECK MOTOR INSULATION.

Use a tester to check for short circuits in the motor.

Connector & terminal


(PS2) No. 1 — Steering gearbox body:

(PS2) No. 2 — Steering gearbox body:


(PS2) No. 3 — Steering gearbox body:

Is the resistance 1 M Ω or more? (While wiggling the harness)

Yes

Replace the power steering control module.  [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Power Steering Control Module.](#)

No

Replace the steering gearbox.  [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Electric Power Steering Gearbox.](#)


POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2533 CONTROL MODULE BOARD TEMPERATURE SENSOR

Trouble symptom:

The steering wheel operation feels heavy.

Note:

When this code is displayed, replace the power steering control module with new parts.  Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Power Steering Control Module.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2541 VEHICLE DYNAMICS CONTROL MODULE VEHICLE SPEED SENSOR

Trouble symptom:


The steering wheel operation feels heavy.

1. CHECK DTC.

Read the DTC of VDC system using the Subaru Select Monitor.

Is a DTC related to VDC CM or vehicle speed signal detected?


Yes

Perform the diagnosis according to the DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


 [Go to 2.](#)

2. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system using the Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is a DTC related to CAN communication detected?

Yes

Perform the diagnosis according to the DTC.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 3.](#)

3. CHECK VEHICLE SPEED SIGNAL.

1. Display the data monitor [Vehicle Speed] of the power steering control module using the Subaru Select Monitor.
2. Lift up the vehicle (so that the wheels turn freely), start the engine, and raise engine speed in gear.


Caution:

Be careful that no one is near the spinning tires and nothing gets caught in them.


3. Check for whether the data changes according to vehicle speed.

Is the data in sync with the vehicle speed?

Yes

It is possible that temporary poor communication occurs. Perform the clear memory operation.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Clear memory.](#)

No

Replace the power steering control module.  [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Power Steering Control Module.](#)


POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2543 ERROR PASSIVE

Trouble symptom:


The steering wheel operation feels heavy.

1. CHECK LAN SYSTEM.


Perform the diagnosis for LAN system using the Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is a DTC related to CAN communication detected?

Yes

Perform the diagnosis according to the DTC.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Check for poor contact of the connector, and check the conditions again. If the condition recurs, perform the diagnosis according to the DTC.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)
If it does not recur, complete the inspection.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2545 EYESIGHT SYSTEM


Trouble symptom:

- Auto Start Stop does not operate. (Model with Auto Start Stop)
- EyeSight steering support function does not operate.

1. CHECK POOR CONTACT OF CONNECTOR.

Is there poor contact of the stereo camera connector?

Repair the poor contact of connector.

 [Go to 2.](#)

2. CHECK DTC.


Using the Subaru Select Monitor, read all DTCs.

Is DTC of EyeSight system detected?


Perform the diagnosis according to the DTC.


 [Go to 3.](#)

3. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system using the Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)



Is a DTC related to CAN communication detected?

Perform the diagnosis according to DTC.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

 [Go to 4.](#)


4. CHECK POWER STEERING CONTROL MODULE.



1. Connect all connectors.
2. Clear the memory.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.

Is DTC C2545 detected?

Yes

Replace the power steering control module.  [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Power Steering Control Module.](#)

No

It results from a temporary noise interference.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2546 EYESIGHT VALUE


Trouble symptom:

- Auto Start Stop does not operate. (Model with Auto Start Stop)
- EyeSight steering support function does not operate.

1. CHECK POOR CONTACT OF CONNECTOR.

Is there poor contact of the stereo camera connector?

Repair the poor contact of connector.

 [Go to 2.](#)

2. CHECK DTC.


Using the Subaru Select Monitor, read all DTCs.

Is DTC of EyeSight system detected?


Perform the diagnosis according to the DTC.

 [Go to 3.](#)

3. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system using the Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)



Is a DTC related to CAN communication detected?

Perform the diagnosis according to DTC.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

 [Go to 4.](#)


4. CHECK POWER STEERING CONTROL MODULE.



1. Connect all connectors.
2. Clear the memory.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.

Is DTC C2546 detected?

Yes

Replace the power steering control module.  [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Power Steering Control Module.](#)

No

It results from a temporary noise interference.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2547 EYESIGHT CHECK SUM


Trouble symptom:

- Auto Start Stop does not operate. (Model with Auto Start Stop)
- EyeSight steering support function does not operate.

1. CHECK POOR CONTACT OF CONNECTOR.

Is there poor contact of the stereo camera connector?

Repair the poor contact of connector.

 [Go to 2.](#)

2. CHECK DTC.


Using the Subaru Select Monitor, read all DTCs.

Is DTC of EyeSight system detected?


Perform the diagnosis according to the DTC.


 [Go to 3.](#)

3. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system using the Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)



Is a DTC related to CAN communication detected?

Perform the diagnosis according to DTC.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

 [Go to 4.](#)


4. CHECK POWER STEERING CONTROL MODULE.



1. Connect all connectors.
2. Clear the memory.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.

Is DTC C2547 detected?

Yes

Replace the power steering control module.  [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Power Steering Control Module.](#)

No

It results from a temporary noise interference.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2551 POWER SUPPLY RELAY

Trouble symptom:

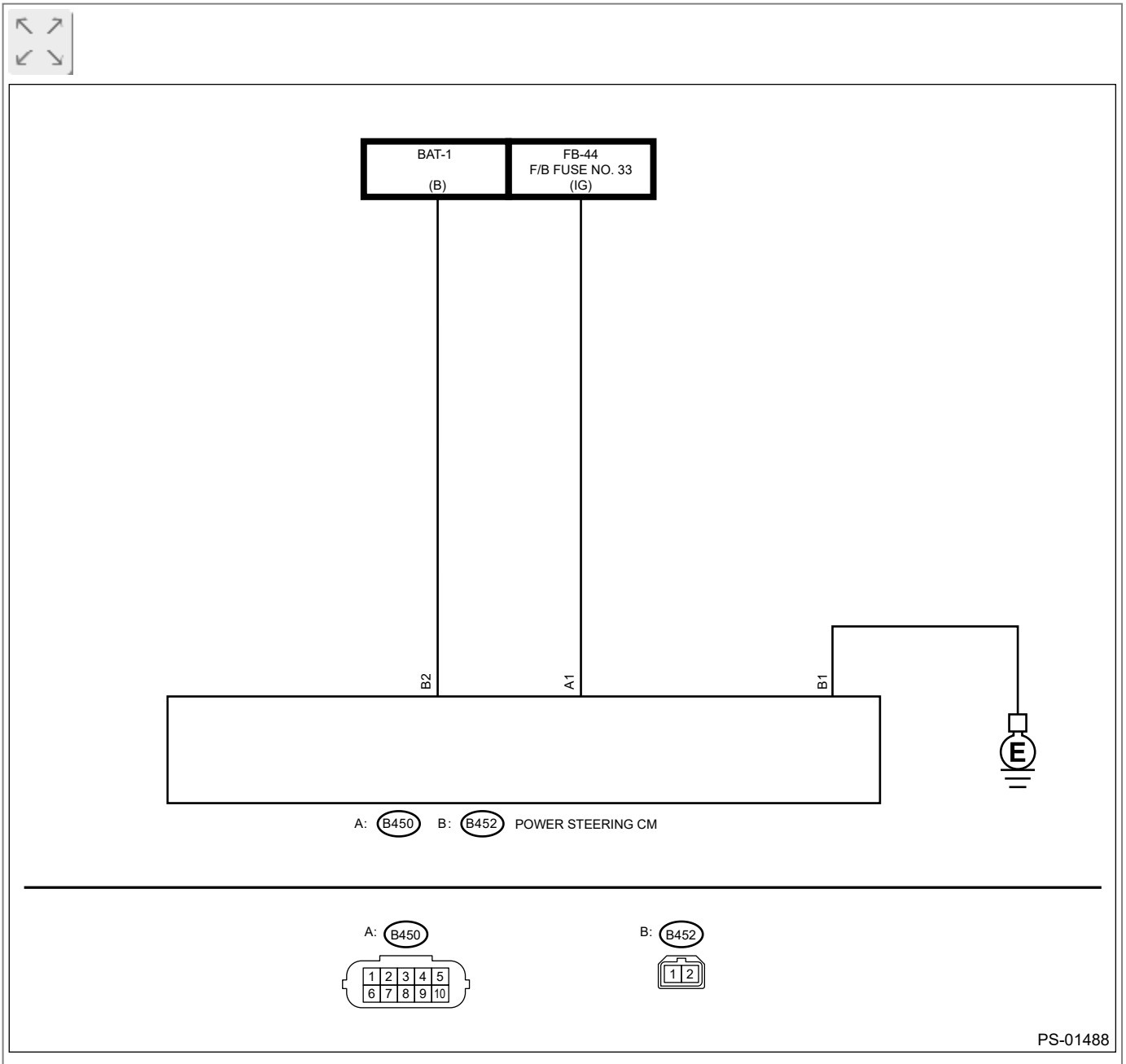
- The steering wheel operation feels heavy.
- STEERING warning light illuminates.

Note:



If power supply voltage failure exists at the vehicle side, the warning light goes off if the normal voltage returns.

Wiring diagram:

Electric power steering system  [Ref. to WIRING SYSTEM>Electric Power Steering System.](#)




1. CHECK BATTERY.

Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DOTC\)>General Description.](#)  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery>INSPECTION.](#)

Is the check result OK?

Yes

 [Go to 2.](#)

No

Charge or replace the battery.

2. CHECK BATTERY TERMINALS AND FUSE.

Check the battery terminals and the fuse.

Is the check result OK?

Yes

 [Go to 3.](#)

No

Repair or replace faulty parts.

3. CHECK WIRING HARNESS.

1. Disconnect the connector of the power steering control module.
2. Turn the ignition switch to ON.
3. Using a tester and test harness, check the voltage between terminals.

Connector & terminal

(B452) No. 2 (+) — Chassis ground (-):

Is the voltage 12 V or more?

Yes

 [Go to 4.](#)

No

Repair the open circuit of harness or the poor contact of connector between the power steering control module and the battery.

4. CHECK GROUND CIRCUIT.

1. Turn the ignition switch to OFF.


2. Using a tester and test harness, check the resistance between terminals.

Connector & terminal

(B452) No. 1 — Chassis ground:

Is the resistance less than 1 Ω ?

Yes

Check for poor contact of terminals in the power steering control module, and if there are no malfunctions, replace the power steering control module. 
[Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Power Steering Control Module.](#)

No

Repair the open circuit or poor contact of the harness between the power steering control module and chassis ground.


POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2552 MOTOR RELAY

Trouble symptom:

- The steering wheel operation feels heavy.
- STEERING warning light illuminates.


Note:

When this code is displayed, replace the power steering control module with new parts.  Ref. to [POWER ASSISTED SYSTEM \(POWER STEERING\)>Power Steering Control Module.](#)

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF


Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"


Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE


Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE


Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"


Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE


Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1235 LOST COMMUNICATION WITH EYESIGHT


Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

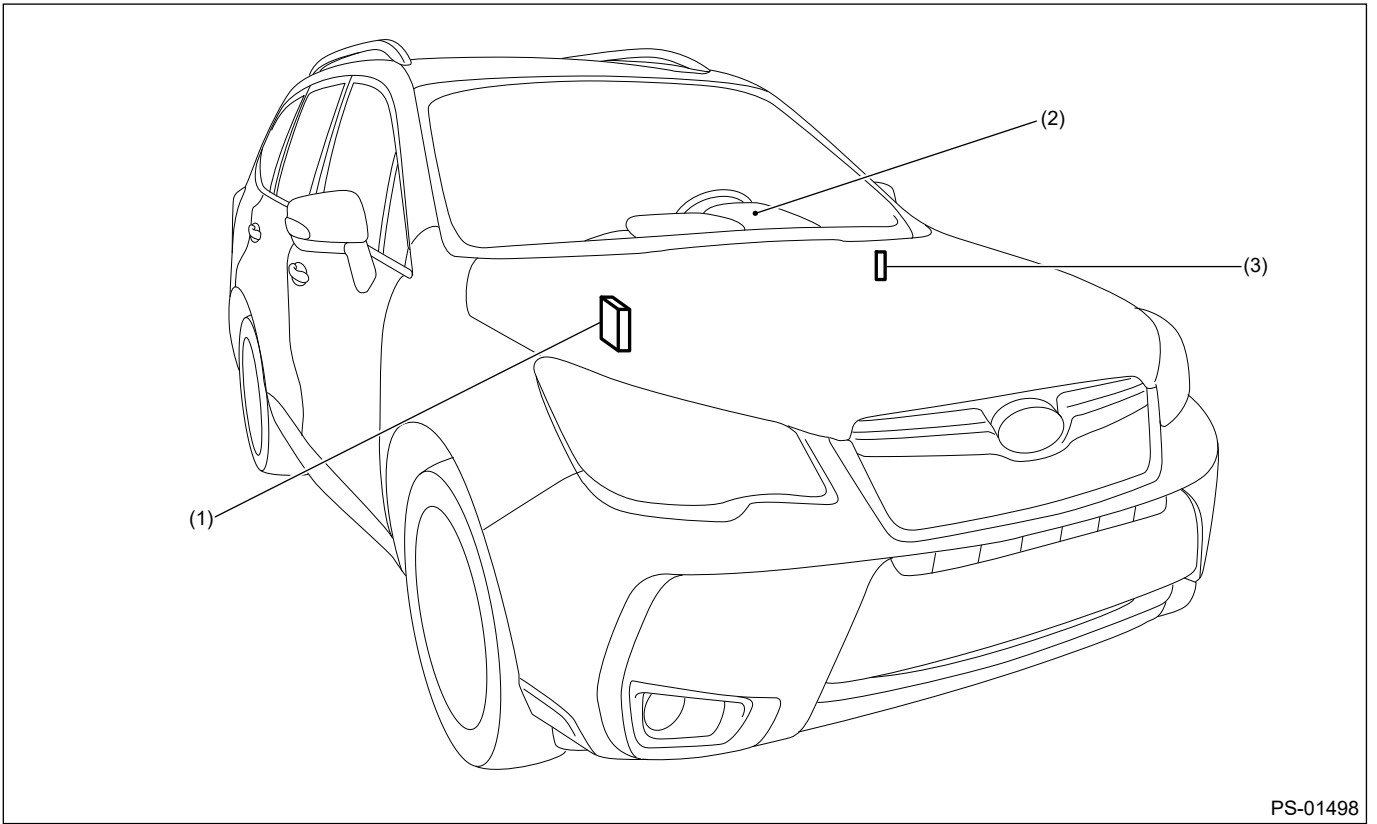
DTC U1433 INVALID DATA RECEIVED FROM EYESIGHT

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

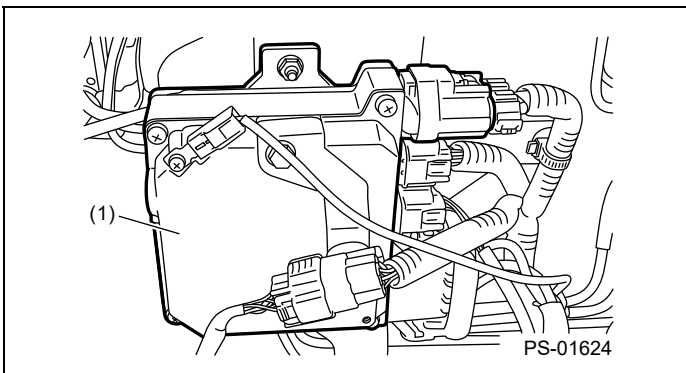
POWER STEERING (DIAGNOSTICS) > Electrical Component Location

LOCATION

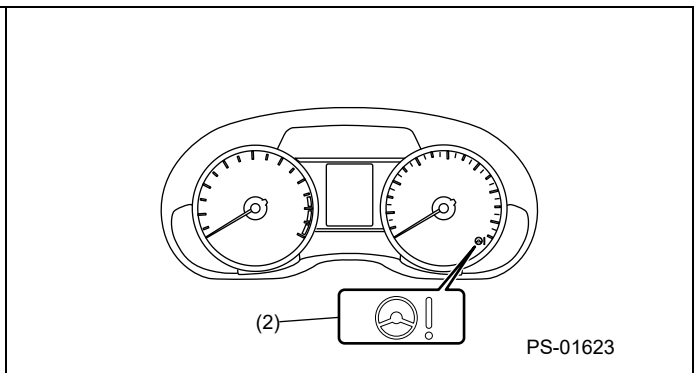


PS-01498

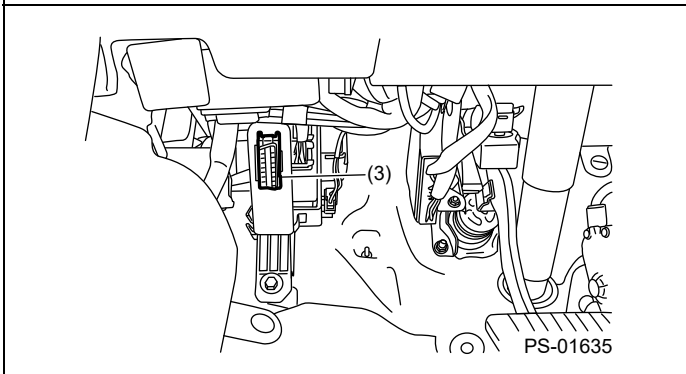
(1) Power steering control module (2) STEERING warning light (3) Data link connector



PS-01624



PS-01623



PS-01635

CAUTION

1. SRS AIRBAG SYSTEM

The airbag system wiring harness is routed near the power steering control module.

Caution:

- **Do not use electrical test equipment on wiring harness and connector circuits of the airbag system.**
- **Be careful not to damage the airbag system wiring harness during maintenance of the power steering control module.**

POWER STEERING (DIAGNOSTICS) > General Description

INSPECTION


Before performing diagnosis, check the following items which might be affecting the power steering problem.

1. BATTERY

Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DOTC\)>General Description.](#)

 [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery>INSPECTION.](#)


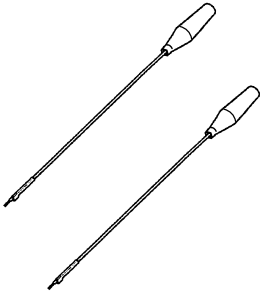
2. TIRES

Check the tire specifications, tire wear and air pressure.  [Ref. to WHEEL AND TIRE SYSTEM>General Description>SPECIFICATION.](#)

POWER STEERING (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>STSSM4</p>	<p>— (Newly adopted tool)</p>	<p>SUBARU SELECT MONITOR 4</p>	<p>Used for setting of each function and troubleshooting for electrical system.</p> <p>Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".</p>
 <p>ST34199AG100</p>	<p>34199AG100</p>	<p>SPECIAL TOOL HARNESS</p>	<p>Used for troubleshooting the electrical system.</p>

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Oscilloscope	Used for measuring the sensor.
DST-i	Used together with Subaru Select Monitor 4.










POWER STEERING (DIAGNOSTICS) > Inspection Mode








PROCEDURE









Reproduce the malfunction occurrence condition as much as possible.




POWER STEERING (DIAGNOSTICS) > List of Diagnostic Trouble Code (DTC)

LIST

DTC	Item	Content of diagnosis	Note
None	No display	Normal	 Ref. to POWER STEERING (DIAGNOSTICS)>Subaru Select Monitor>INSPECTION > WITHOUT DTC.
	Assist limitation is displayed for the current data EPS operating condition.	Assist limitation is performed due to overheat protection control.	 Ref. to POWER STEERING (DIAGNOSTICS)>STEERING Warning Light>STEERING WARNING LIGHT DOES NOT COME ON > POWER STEERING ASSIST DISABLED.
	The current data overheating protection intervention history indicates at least 1 time.	There are previous records of intervention to overheat protection control.	 Ref. to POWER STEERING (DIAGNOSTICS)>STEERING Warning Light>STEERING WARNING LIGHT DOES NOT COME ON > POWER STEERING ASSIST DISABLED.
C2511	TORQUE SENSOR MAIN	<ul style="list-style-type: none"> • Poor connector contact • Forgot to connect connector • Faulty torque sensor section circuit • Faulty torque sensor coil 	 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2511 TORQUE SENSOR MAIN.
C2512	TORQUE SENSOR SUB		 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2512 TORQUE SENSOR SUB.
C2513	TORQUE SENSOR MUCH TOLERANCE		 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2513 TORQUE SENSOR MUCH TOLERANCE.
C2514	TORQUE SENSOR POWER SUPPLY		 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2514 TORQUE SENSOR POWER SUPPLY.
C2521	MOTOR MALFUNCTION	<ul style="list-style-type: none"> • Poor connector contact • Forgot to connect connector • Harness open/short circuit 	 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2521 MOTOR MALFUNCTION.
C2522	RESOLVER SENSOR		 Ref. to POWER STEERING

		<ul style="list-style-type: none"> • Motor open circuit • Power transistor shorted/open • Terminal power supply or ground short 	(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2522 RESOLVER SENSOR.
C2531	CONTROL MODULE CPU	Faulty main unit of power steering control module	 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2531 CONTROL MODULE CPU.
C2532	CONTROL MODULE PERIPHERAL CIRCUIT	<ul style="list-style-type: none"> • Poor connector contact • Forgot to connect connector • Harness open/short circuit • Motor open circuit • Faulty main unit of power steering control module 	 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2532 CONTROL MODULE PERIPHERAL CIRCUIT.
C2533	CONTROL MODULE BOARD TEMPERATURE SENSOR	Faulty main unit of power steering control module	 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2533 CONTROL MODULE BOARD TEMPERATURE SENSOR.
C2541	VEHICLE DYNAMICS CONTROL MODULE VEHICLE SPEED SENSOR	<ul style="list-style-type: none"> • Poor connector contact • Forgot to connect connector • Harness open/short circuit 	 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2541 VEHICLE DYNAMICS CONTROL MODULE VEHICLE SPEED SENSOR.
C2543	ERROR PASSIVE	Defective CAN communication	 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2543 ERROR PASSIVE.
C2545	EyeSight SYSTEM	EyeSight system failure	 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2545 EYESIGHT SYSTEM.
C2546	EyeSight VALUE	EyeSight system failure	 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic

			Procedure with Diagnostic Trouble Code (DTC)>DTC C2546 EYESIGHT VALUE .
C2547	EyeSight CHECK SUM	<ul style="list-style-type: none"> • EyeSight system failure • Defective CAN communication 	 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2547 EYESIGHT CHECK SUM .
C2551	POWER SUPPLY RELAY	<ul style="list-style-type: none"> • Power supply voltage • Faulty relay contact 	 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2551 POWER SUPPLY RELAY.
C2552	MOTOR RELAY	Faulty relay	 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2552 MOTOR RELAY.
U0073	CAN FAILURE, BUS 'OFF' DETECTION	Defective CAN communication	 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	Defective CAN communication	 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Defective CAN communication	 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Defective CAN communication	 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	Defective CAN communication	 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble


			Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	Defective CAN communication	 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U1235	LOST COMMUNICATION WITH EyeSight	Defective CAN communication	 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1235 LOST COMMUNICATION WITH EyeSight.
U1433	INVALID DATA RECEIVED FROM EyeSight	Defective CAN communication	 Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1433 INVALID DATA RECEIVED FROM EyeSight.

POWER STEERING (DIAGNOSTICS) > Read Diagnostic Trouble Code (DTC)

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Power Steering].
5. On [Select Function] display, select [DTC].

Note:

- For details concerning the DTC, refer to “List of Diagnostic Trouble Code (DTC)”.
 [Ref. to POWER STEERING \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)
- For detailed operation procedures, refer to “Application help”.

STEERING WARNING LIGHT DOES NOT COME ON

1. POWER STEERING ASSIST ENABLED

Detecting condition:

- Defective combination meter
- Defective harness

Trouble symptom:

When the ignition switch is turned to ON (engine OFF), the STEERING warning light does not illuminate.

Note:

It is operating normally if the warning light illuminates when the ignition switch is turned to ON (engine OFF), and turns off approximately two seconds after engine start.

1. CHECK ILLUMINATION OF OTHER LIGHTS.

Turn the ignition switch to ON. (Engine OFF)

Do other warning lights illuminate?

Yes

[Go to 2.](#)

No

Check the combination meter. [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>INSPECTION.](#)

2. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system using the Subaru Select Monitor. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is a DTC related to CAN communication detected?


Yes

Perform the diagnosis according to DTC. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 3.](#)

3. CHECK COMBINATION METER.


Check the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.](#)

Is the check result OK?

Yes

The combination meter is normal.

No



Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

2. POWER STEERING ASSIST DISABLED

Trouble symptom:

- There is no assist due to power supply voltage failure.
- The STEERING warning light is normal but there is no power steering assist (steering feels heavy).

1. CHECK BATTERY.

Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DOTC\)>General Description.](#)  [Ref. to STARTING/CHARGING SYSTEMS\(H4DQ\)>Battery>INSPECTION.](#)

Is the check result OK?

Yes

 [Go to 2.](#)

No

Charge or replace the battery.

2. CHECK BATTERY TERMINALS AND FUSE.

Check the battery terminals and the fuse.

Is the check result OK?

Yes

 [Go to 3.](#)

No


Repair or replace faulty parts.

3. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs.

Is DTC related to VDC system or ignition power supply system displayed?

Yes

Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 4.](#)

4. CHECK DATA MONITOR.


1. Start the engine.
2. Display the data monitor [Engine Speed] of the power steering control module using the Subaru Select Monitor.

Is [Engine Speed] the same as that in the combination meter?

Yes

 [Go to 5.](#)

No

Check the CAN communication.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

5. CHECK DATA MONITOR.

Display the data monitor [EPS Status] of the power steering control module using the Subaru Select Monitor.

Is [Assist limitation] displayed?

Yes

It is possible that temporary assist limitation has occurred due to overheat protection. Stop the engine for approx. 10 minutes, and check again.

No

 [Go to 6.](#)

6. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, display the data monitor [Torque sensor main output][Torque sensor sub output] of the power steering control module.
2. Move the steering wheel to the left and right.

Do the values of [Torque sensor main output] and [Torque sensor sub output] change along with the operation?

Yes

 [Go to 7.](#)

No

Check the installation status of torque sensor, and check again.

7. CHECK DATA MONITOR.

Display the data monitor [IG voltage] of the power steering control module using the Subaru Select Monitor.

Is [IG voltage] stable? (While wiggling the harness)

Yes

 [Go to 8.](#)

No

Check the ignition switch and IG voltage harness, and repair the defective part.

8. CHECK CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the connector (B450).

Are there any damages to terminal or other parts either on the power steering control module side or on the connector side?

Yes

Repair the terminal.

No

Replace the power steering control module.  [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Power Steering Control Module.](#)

Note:

- **Power steering assist is not started unless both of the ignition switch ON signal and the engine speed signal are input.**
- **In any of the following cases, the power steering assist is limited and steering wheel operation may become heavy.**
If the steering wheel is held to an end for a long time, or the steering wheel turning to right and left at slow speed is repeated during parking, the assist limitation (overheat protection control) may operate to prevent failures by overheat.

In this case, by stopping the engine for approx. 10 minutes for cooling, the assist will start operating. While assist limitation (overheat protection control) is in active, Assist limitation is displayed in the EPS operating condition in the Subaru Select Monitor "Data monitor".

- History can be confirmed on Overheating protection intervention history or IGN count from overheating protection (most recent) of "Data monitor".**
- The overheat protection control system is normal operation, therefore, the STEERING warning light will not come on and there will be no DTC displayed.**
- If the power steering system connector is disconnected while cooling under the overheat protection control, different DTC may be recorded. If there is no DTC and assist limitation is in active, stop the engine for approx. 10 minutes for cooling.**

POWER STEERING (DIAGNOSTICS) > STEERING Warning Light

STEERING WARNING LIGHT DOES NOT GO OFF


Detecting condition:

- Defective combination meter
- Open circuit of harness

Trouble symptom:


When starting the engine, the STEERING warning light continues to illuminate.

1. CHECK DTC.

Read the DTC of the power steering control module using the Subaru Select Monitor.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

Is DTC detected?


Yes

Perform the diagnosis according to DTC.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


 [Go to 2.](#)

2. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system using the Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is a DTC related to CAN communication detected?

Yes

Perform the diagnosis according to DTC.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

Check the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>INSPECTION.](#)

INSPECTION

1. COMMUNICATION FOR INITIALIZING IMPOSSIBLE

Detecting condition:

- Defective harness connector
- Defective power steering control module

Trouble symptom:

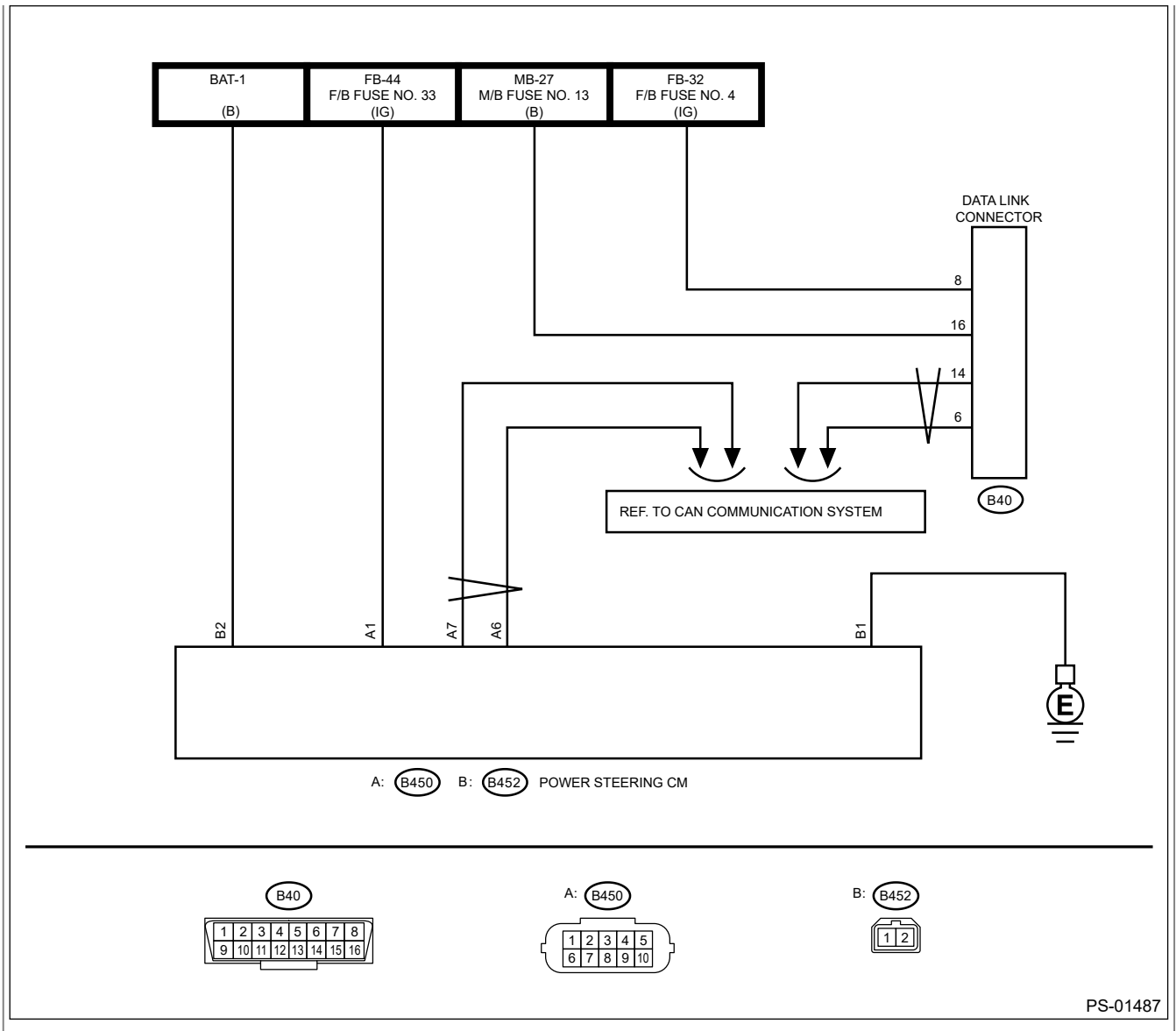
- Communication is impossible between the power steering control module and Subaru Select Monitor.
- After starting the engine, the STEERING warning light does not illuminate but steering effort is heavy.

Wiring diagram:

Electric power steering system  [Ref. to WIRING SYSTEM>Electric Power Steering System.](#)

CAN communication system  [Ref. to WIRING SYSTEM>CAN Communication System.](#)





PS-01487

1. CHECK IGNITION SWITCH.



Is the ignition switch ON?

Yes

[Go to 2.](#)

No

Turn the ignition switch to ON, and select the power steering using the Subaru Select Monitor.

2. CHECK BATTERY.



1. Turn the ignition switch to OFF.
2. Measure the battery voltage.

Is the voltage 11 V or more?

Yes

 [Go to 3.](#)

No

Charge or replace the battery.

3. CHECK BATTERY TERMINAL.

Is there poor contact at battery terminal?

Yes

Replace or tighten the battery terminal.

No

 [Go to 4.](#)

4. CHECK POWER STEERING CONTROL MODULE CONNECTOR INSTALLATION.

Turn the ignition switch to OFF.

Is the power steering control module connector inserted into the power steering control module until the clamp locks?

Yes

 [Go to 5.](#)

No


Insert the power steering control module connector into the power steering control module.

5. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is there any fault in LAN system?

Yes

Perform the diagnosis according to DTC for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 6.](#)


6. CHECK SUBARU SELECT MONITOR COMMUNICATION.



1. Turn the ignition switch to ON.
2. Check whether communication to electric power steering system can be executed normally.

Is the [Select Function] screen displayed?

Yes

Check DTC of electric power steering system.  [Ref. to POWER STEERING \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 7.](#)

7. CHECK SUBARU SELECT MONITOR COMMUNICATION.



Connect the Subaru Select Monitor to another vehicle to check whether the communication for initializing can be executed normally.

Is the check result OK?

Yes

 [Go to 8.](#)

No

Repair or replace the Subaru Select Monitor.

8. CHECK POWER SUPPLY CIRCUIT.



1. Turn the ignition switch to ON. (Engine OFF)
2. Measure the ignition power supply voltage between the power steering control module connector and chassis ground.

Connector & terminal

(B450) No. 1 (+) — Chassis ground (-):

(B452) No. 2 (+) — Chassis ground (-):

Is the voltage 10 — 15 V?

Yes

 [Go to 9.](#)

No

Repair the open circuit in the harness between the power steering control module and the battery.

9. CHECK HARNESS CONNECTOR BETWEEN POWER STEERING CONTROL MODULE AND CHASSIS GROUND.


1. Turn the ignition switch to OFF.
2. Disconnect the connector from the power steering control module.
3. Measure the resistance of harness between power steering control module connector and chassis ground.

Connector & terminal

(B452) No. 1 — Chassis ground:

Is the resistance less than 10 Ω?

Yes

 [Go to 10.](#)

No

Repair the open circuit of the power steering control module ground circuit and the poor contact of connector.


10. CHECK POOR CONTACT OF CONNECTOR.

Is there poor contact of power steering control module power supply, ground circuit and data link connector?

Yes

Repair the connector.

No

Replace the power steering control module.  [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Power Steering Control Module.](#)

2. WITHOUT DTC

Detecting condition:

- Defective combination meter
- Open circuit of harness


Trouble symptom:

- The STEERING warning light will not turn off.
- [No Diagnostic Code Present] will be displayed on Subaru Select Monitor.

Note:


When the STEERING warning light is OFF and [No Diagnostic Code Present] is displayed on Subaru Select Monitor when all DTCs are read, the system is operating properly.

1. CHECK LAN SYSTEM.


Perform the diagnosis for LAN system using the Subaru Select Monitor.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is DTC U0131 detected?

Yes

Perform the diagnosis according to DTC for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

 [Go to 2.](#)

2. CHECK COMBINATION METER.


Check the STEERING warning light when the ignition switch is turned from OFF to ON.

Does the STEERING warning light illuminate at ignition switch ON, and turn off two seconds after the engine is started?

Yes

Finish the diagnosis.

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

POWER STEERING (DIAGNOSTICS) > Subaru Select Monitor

OPERATION

1. HOW TO USE SUBARU SELECT MONITOR

For detailed operation procedures, refer to "Application help".

2. DATA MONITOR

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Power Steering].
5. On [Select Function] display, select [Data monitor].

Display	Contents to be displayed	Range	Unit
Torque sensor main output	Main torque sensor output voltage is displayed.	0 – 5	V
Torque sensor sub output	Sub torque sensor output voltage is displayed.	0 – 5	V
Torque sensor reference voltage	Torque sensor standard voltage is displayed.	0 – 5	V
Power current	The current flowing to CM is displayed.	-128 – 127	A
Vehicle Speed Sensor	Vehicle speed is displayed. (CAN communication data)	0 – 255	km/h
Engine Speed	Engine speed is displayed. (CAN communication data)	0 – 12750	rpm
CU Sensing Current(q)	The current flowing to the motor relay is displayed.	-128 – 127	A
3-phase motor current (U-phase)	The U phase actual current value as calculated by the microcomputer from the torque sensor input is displayed.	-128 – 127	A
3-phase motor current (V-phase)	The V phase actual current value as calculated by the microcomputer from the torque sensor input is displayed.	-128 – 127	A
Motor angular speed	Data from the resolver sensor is displayed.	-4096 – 4064	rpm
ECM Temperature	The thermistor temperature of the steering control module is displayed.	-50 – 205	Celsius
Power Supply Voltage	Battery voltage is displayed.	0 – 25.5	V
Torque sensor power supply voltage	The power supply voltage output to the torque sensor is displayed.	0 – 10.2	V
IG voltage	The power supply voltage supplied to the ECM is displayed.	0 – 25.5	V
CAN bus status	Either Active/Passive/Bus Off is displayed.	—	—
EPS operating	Either Normal/Assist Stop/Assist Limitation is	—	—

condition	displayed.		
CU Target current(q)	The motor target current value required for assist is displayed.	-128 — 127	A
Steering angle	Steering angle of steering wheel is displayed.	-640 — 635	deg
Reading assist MAP	Either MAP1/MAP2/MAP3 is displayed.	—	—
Overheating protection intervention history	Number of interventions to the overheat protection control (assist limitation for protecting the power steering from overheating)*1	0 — 250	Time
IG Count after ECU Overheat Protection(latest)	Number of times the ignition switch is ON from the intervention to overheat protection control (most recent) until now*2	0 — 65000	Time
IG Count after ECU Overheat Protection(Previous)	Number of times the ignition switch is ON from the intervention to overheat protection control (previous) until now*2	0 — 65000	Time
IG Count after ECU Overheat Protection(Before Previous)	Number of times the ignition switch is ON from the intervention to overheat protection control (before previous) until now*2	0 — 65000	Time
Assist limit history (low voltage, high voltage)	Number of intervention to assist limit when the power supply voltage is low or high*1	0 — 250	Time
IG OFF Number while Driving	Number of times the ignition switch is turned OFF while driving*1	0 — 250	Time

Note:

- ***1 When the value exceeds the maximum of 250 times, 250 is displayed.**
- ***2 When there is no intervention of the overheating protection control, "65535" is displayed. If an error such as control unit memory error, etc. occurs, "65534" is displayed.**
- **For detailed operation procedures, refer to "Application help".**

3. FREEZE FRAME DATA

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Power Steering].
5. On [Select Function] display, select [DTC].
6. On [DTC] display, select [FFD].

Display	Contents to be displayed	Range	Unit
Torque sensor main output	Main torque sensor output voltage is displayed.	0 — 5	V
Torque sensor sub output	Sub torque sensor output voltage is displayed.	0 — 5	V
Torque sensor reference voltage	Torque sensor standard voltage is displayed.	0 — 5	V

Power current	The current flowing to CM is displayed.	-128 — 127	A
Vehicle Speed Sensor	Vehicle speed is displayed. (CAN communication data)	0 — 255	km/h
Engine Speed	Engine speed is displayed. (CAN communication data)	0 — 12750	rpm
CU Sensing Current(q)	The current flowing to the motor relay is displayed.	-128 — 127	A
3-phase motor current (U-phase)	The U phase actual current value as calculated by the microcomputer from the torque sensor input is displayed.	-128 — 127	A
3-phase motor current (V-phase)	The V phase actual current value as calculated by the microcomputer from the torque sensor input is displayed.	-128 — 127	A
Motor angular speed	Data from the resolver sensor is displayed.	-4096 — 4064	rpm
ECM Temperature	The thermistor temperature of the steering control module is displayed.	-50 — 205	Celsius
Power Supply Voltage	Battery voltage is displayed.	0 — 25.5	V
Torque sensor power supply voltage	The power supply voltage output to the torque sensor is displayed.	0 — 10.2	V
IG voltage	The power supply voltage supplied to the ECM is displayed.	0 — 25.5	V
CAN bus status	Either Active/Passive/Bus Off is displayed.	—	—
EPS operating condition	Either Normal/Assist Stop/Assist Limitation is displayed.	—	—
CU Target current(q)	The motor target current value required for assist is displayed.	-128 — 127	A
Steering angle	Steering angle of steering wheel is displayed.	-640 — 635	deg
Reading assist MAP	Either MAP1/MAP2/MAP3 is displayed.	—	—
Overheating protection intervention history	Number of interventions to the overheat protection control (assist limitation for protecting the power steering from overheating)*1	0 — 250	Time
IG Count after ECU Overheat Protection(latest)	Number of times the ignition switch is ON from the intervention to overheat protection control (most recent) until now*2	0 — 65000	Time
IG Count after ECU Overheat Protection(Previous)	Number of times the ignition switch is ON from the intervention to overheat protection control (previous) until now*2	0 — 65000	Time
IG Count after ECU Overheat Protection(Before Previous)	Number of times the ignition switch is ON from the intervention to overheat protection control (before previous) until now*2	0 — 65000	Time
Assist limit history (low voltage, high	Number of intervention to assist limit when the power supply voltage is low or high*1	0 — 250	Time

voltage)			
IG OFF Number while Driving	Number of times the ignition switch is turned OFF while driving*1	0 – 250	Time

Note:

- ***1 When the value exceeds the maximum of 250 times, 250 is displayed.**
- ***2 When there is no intervention of the overheating protection control, "65535" is displayed. If an error such as control unit memory error, etc. occurs, "65534" is displayed.**
- **Freeze frame data stored at the time of trouble occurrence is shown on the display.**
- **Information of the first trouble occurrence is stored as the freeze frame data in memory.**
- **One freeze frame data is stored.**
- **For detailed operation procedures, refer to "Application help".**

PROCEDURE


1. PERFORM CUSTOMER INTERVIEW.



Ask the customer when and how the trouble occurred using the interview check list.

Did you interview the customer?

Yes

 [Go to 2.](#)

No

Perform the interview.

2. CHECK SUBARU SELECT MONITOR COMMUNICATION.



1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select Reverse Automatic Braking.

Note:

For detailed operation procedures, refer to "Application help".

Is communication possible?

Yes


 [Go to 3.](#)

No

Check the communication circuit.

3. CHECK DTC.



Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes



Record the DTC, time stamp and freeze frame data, and go to next.

No

Perform diagnosis according to the procedures in the diagnostics with phenomenon.

4. PERFORM DIAGNOSIS.



1. Perform the diagnosis for the displayed DTCs.
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory of Reverse Automatic Braking.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Clear memory.](#)
4. Execute the inspection mode.
5. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes

Repeat step 4 until DTC is not shown.

No

Finish the diagnosis.

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Cancel Code

LIST

Code	Description & trouble part	Content
0x01	+B Low Voltage	The battery power supply of RAB CM is reduced.
0x02	IGN Low Voltage	The ignition power supply of RAB CM is reduced.
0x03	RRC Sonar Noise	Ultrasonic sensor (RRC) signal is interfered due to noise.
0x04	RLC Sonar Noise	Ultrasonic sensor (RLC) signal is interfered due to noise.
0x05	RR Sonar Noise	Ultrasonic sensor (RR) signal is interfered due to noise.
0x06	RL Sonar Noise	Ultrasonic sensor (RL) signal is interfered due to noise.
0x07	RRC Sonar Dirty HALT I	Substance adhered to the ultrasonic sensor (RRC).
0x08	RLC Sonar Dirty HALT I	Substance adhered to the ultrasonic sensor (RLC).
0x09	RR Sonar Dirty HALT I	Substance adhered to the ultrasonic sensor (RR).
0x0A	RL Sonar Dirty HALT I	Substance adhered to the ultrasonic sensor (RL).
0x0B	RRC Sonar Dirty HALT II	Substance adhered to the ultrasonic sensor (RRC).
0x0C	RLC Sonar Dirty HALT II	Substance adhered to the ultrasonic sensor (RLC).
0x0D	RR Sonar Dirty HALT II	Substance adhered to the ultrasonic sensor (RR).
0x0E	RL Sonar Dirty HALT II	Substance adhered to the ultrasonic sensor (RL).
0x0F	RRC Sonar Mount Error	Ultrasonic sensor (RRC) is equipped with retrofitted items such as a rack and trailer.
0x10	RLC Sonar Mount Error	Ultrasonic sensor (RLC) is equipped with retrofitted items such as a rack and trailer.

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Cancel Code

NOTE


When the cancel codes are detected from the RAB CM, the Reverse Automatic Braking system will be canceled.

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Cancel Code

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Reverse Automatic Braking] and select [Enter].
5. On [Select Function] display, select [Cancel Code].

Note:

- For detailed operation procedures, refer to "Application help".
- Up to three codes can be stored. When there are four or more codes, the oldest code is deleted and the newest code is stored.
- Stored codes will be cleared by Clear Memory.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Clear memory.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Check List for Interview

CHECK

1. CHECK LIST FOR INTERVIEW

- Inspect the following items regarding the vehicle’s state.
- Print out this page for interviewing customers.



Reverse Automatic Braking Check List for Interview		Received Year Month Date	
Customer’s name		Registration No.	Initial year of registration Year Month Date
		Vehicle model	Frame number
Interviewer	Inspector	Engine type	Odometer reading
Customer specified content • • •			
Date and time when the trouble occurred		Frequency of trouble occurrence	Always occurs
			Sometimes occurs (times per day, times per month)
Location where the trouble occurred		Weather	<input type="checkbox"/> Fine <input type="checkbox"/> Cloudy <input type="checkbox"/> Rainy <input type="checkbox"/> Snowy <input type="checkbox"/> Others
		Temperature	°C (°F) — °C (°F)
Road conditions			
Road surface conditions			
Condition of warning light	<input type="checkbox"/> On <input type="checkbox"/> Off <input type="checkbox"/> Blink		
Accessory installation condition			
Diagnostic Trouble Code			
Time stamp			
Control module item number/ver			
Condition of trouble occurrence (How the trouble occurs)			
Vehicle bring-in history information			

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Clear memory

OPERATION

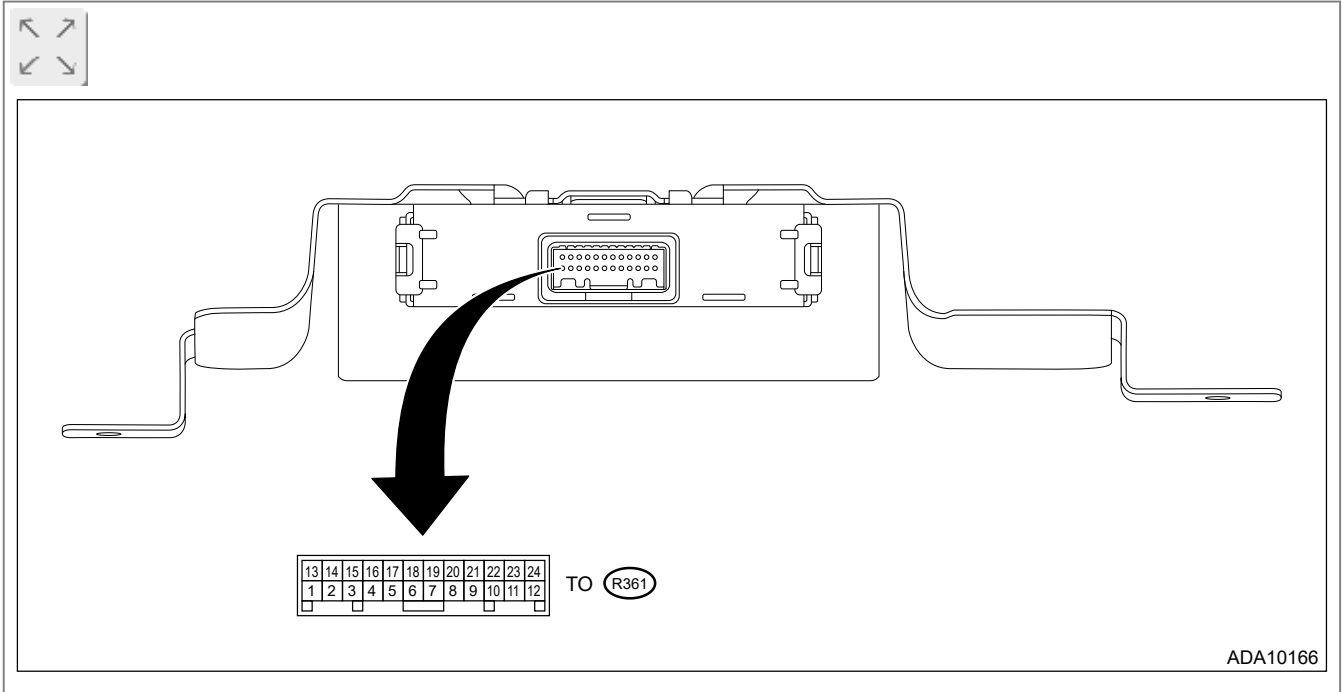
1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Reverse Automatic Braking], and then select [Enter].
5. On [Select Function] display, select [DTC].
6. On [DTC] display, select [Clear memory].

Note:

For detailed operation procedures, refer to “Application help”.

ELECTRICAL SPECIFICATION

1. RAB CM



Terminal No.	Content	Measuring condition	Standard
(R361) No.1 ↔ Chassis ground	Ignition power supply	Ignition switch ON	Battery voltage
(R361) No.2 ↔ Chassis ground	Ground	Always	1 Ω or less
(R361) No.3	Not used	—	—
(R361) No.4	Main CAN-L	—	—
(R361) No.5	Local CAN-H (stereo camera communication line)	—	—
(R361) No.6	Not used	—	—
(R361) No.7	Not used	—	—
(R361) No.8	Sonar sensor communication line (left corner -)	—	—
(R361) No.9	Sonar sensor communication line (right inner -)	—	—
(R361) No.10	Not used	—	—
(R361) No.11	Sonar sensor communication line (left inner +)	—	—
(R361) No.12	Sonar sensor communication line (right corner +)	—	—

(R361) No.13	Battery power supply	Always	Battery voltage
(R361) No.14	Not used	—	—
(R361) No.15	Not used	—	—
(R361) No.16	Main CAN-H	—	—
(R361) No.17	Not used	—	—
(R361) No.18	Local CAN-L (stereo camera communication line)	—	—
(R361) No.19	Not used	—	—
(R361) No.20	Not used	—	—
(R361) No.21	Sonar sensor communication line (left inner -)	—	—
(R361) No.22	Sonar sensor communication line (right corner -)	—	—
(R361) No.23	Sonar sensor communication line (left corner +)	—	—
(R361) No.24	Sonar sensor communication line (right inner +)	—	—

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Customize

LIST

Customize item	Initial setting value	Setting value	Content
RAB always OFF/ON setting	Always ON	Always ON Always OFF	ON/OFF of the RAB function can be selected.
Alarm always OFF/ON setting	Always ON	Always ON Always OFF	ON/OFF of the alarm sound can be selected.

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Customize

OPERATION

- 1.** On [Start] display, select [Diagnosis].
- 2.** On [Vehicle selection] display, input the target vehicle information and select [OK].
- 3.** On [Main Menu] display, select [Each System].
- 4.** On [Select System] display, select [Reverse Automatic Braking], and then select [Enter].
- 5.** On [Select Function] display, select [Customize], and select [Next].

Note:

For detailed operation procedures, refer to “Application help”.

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Data Monitor

LIST

Items to be displayed	Content	Standard	Note (unit)
Battery Voltage	System information.	0 – 24.5	V
Voltage of IGN	System information.	0 – 17.85	V
Sonar	System information.	0 – 24.5	V
RAB Detection Distance(Coordinate:X)	Sonar sensor detection information.	0 – 510	cm
RAB Detection Distance(Coordinate:Y)	Sonar sensor detection information.	-255 – 254	cm
RR Sonar Detection Distance	Sonar sensor detection information.	0 – 510	cm
RRC Sonar Detection Distance	Sonar sensor detection information.	0 – 510	cm
RL Sonar Detection Distance	Sonar sensor detection information.	0 – 510	cm
RLC Sonar Detection Distance	Sonar sensor detection information.	0 – 510	cm
Drive Wheel Average Speed	Vehicle information.	0 – 3686.4	km/h
Wheel Speed for Fail Safe	Vehicle information.	0 – 3686.4	km/h
Vehicle Height Sensor Voltage	Vehicle information.	0 – 5.1	V
Ambient Air Temperature	Vehicle information.	-40 – 87	°C
Shift Position	Vehicle information.	-	-
EPB Equipment Information	Operation instruction from EyeSight.	<ul style="list-style-type: none"> •Vehicle without EPB •Vehicle with EPB 	-
EyeSight Initialization(RAB)	Operation instruction from EyeSight.	<ul style="list-style-type: none"> •EyeSight initialization in progress •Initialization completed 	-
Recession Control Permission(RAB)	Operation instruction from EyeSight.	<ul style="list-style-type: none"> •Reverse control not permitted •Reverse control permitted 	-
RAB Fail Indication(EyeSight→RAB)	Operation instruction from EyeSight.	<ul style="list-style-type: none"> •No failure •Failure 	-
RAB OFF	Operation instruction	•RAB ON	-

Indication(EyeSight→RAB)	from EyeSight.	•RAB forced OFF	
RAB Acceleration Suppression Control State(EyeSight→RAB)	Operation instruction from EyeSight.	•No control •Acceleration prevented •Progressively increasing	-
RAB Brake Control State(EyeSight→RAB)	Operation instruction from EyeSight.	•No control •Pre-compression controlled •Brake controlled •Stop holding •Progressively decreasing	-
RAB Precompression Control	Braking control instruction from RAB CM.	•Not performed •Pre-compression conducted	-
RAB Acceleration Suppression Value	Braking control instruction from RAB CM.	0 – 2.55	G
RAB Acceleration Suppression Control	Braking control instruction from RAB CM.	•Not performed •Acceleration prevention conducted	-
Deceleration Braking Instruction	Braking control instruction from RAB CM.	0 – 2.55	G
Recession Pre-Collision Brake Control	Braking control instruction from RAB CM.	•Not performed •Performed	-
RAB Function OFF Information	HMI control instruction from RAB CM.	•ON •OFF	-
Audible Alarm function OFF Information(RAB)	HMI control instruction from RAB CM.	•ON •OFF	-
Sonar System HALT(RAB)	HMI control instruction from RAB CM.	•Normal •Foreign objects on sonar •Abnormality detected	-
RAB Sonar System Failure(EyeSight→RAB)	HMI control instruction from RAB CM.	•Normal •Sonar failure •System failure	-
RAB Function pause Do Not Disturb	HMI control instruction from RAB CM.	•Operation permitted •Operation not permitted	-
RAB Alarm pause Do Not Disturb	HMI control instruction from RAB CM.	•Operation permitted	-

		<ul style="list-style-type: none"> •Operation not permitted 	
Rear Sonar Distance Alarm Information (Rear_Center)	HMI control instruction from RAB CM.	<ul style="list-style-type: none"> •No obstacle •Far •Middle •Short •Closest 	-
Rear Sonar Distance Alarm Information (Rear Right Corner)	HMI control instruction from RAB CM.	<ul style="list-style-type: none"> •No obstacle •Far •Middle •Short 	-
Rear Sonar Distance Alarm Information (Rear Left Corner)	HMI control instruction from RAB CM.	<ul style="list-style-type: none"> •No obstacle •Far •Middle •Short 	-
RAB Alarm Level	HMI control instruction from RAB CM.	<ul style="list-style-type: none"> •OFF •Level 1 •Level 2 •Level 3 •Level 4 •Level 5 	-
RAB Alarm Interrupt Display Instruction	HMI control instruction from RAB CM.	<ul style="list-style-type: none"> •No display •Caution for backward •Encourage braking 	-
RAB Function Pause Information(MFD/AVN)	HMI settings instruction from MFD/navigation.	<ul style="list-style-type: none"> •ON •OFF 	-
RAB Alarm Pause Information(MFD/AVN)	HMI settings instruction from MFD/navigation.	<ul style="list-style-type: none"> •ON •OFF 	-
RAB Function Pause Information Change Request(MFD/AVN)	HMI settings instruction from MFD/navigation.	<ul style="list-style-type: none"> •Yes •No 	-
RAB Function ON/OFF Information(MET)	HMI settings instruction from the combination meter.	<ul style="list-style-type: none"> •ON •OFF 	-
RAB Alarm ON/OFF Information(MET)	HMI settings instruction from the combination meter.	<ul style="list-style-type: none"> •ON •OFF 	-
RAB Function ON/OFF Information Change Request(MET)	HMI settings instruction from the combination meter.	<ul style="list-style-type: none"> •Yes •No 	-

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Data Monitor

OPERATION

- 1.** On [Start] display, select [Diagnosis].
- 2.** On [Vehicle selection] display, input the target vehicle information and select [OK].
- 3.** On [Main Menu] display, select [Each System].
- 4.** On [Select System] display, select [Reverse Automatic Braking], and then select [Enter].
- 5.** On [Select Function] display, select [Data monitor].

Note:

For detailed operation procedures, refer to “Application help”.

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

INSPECTION

1. COMMUNICATION FOR INITIALIZING IMPOSSIBLE

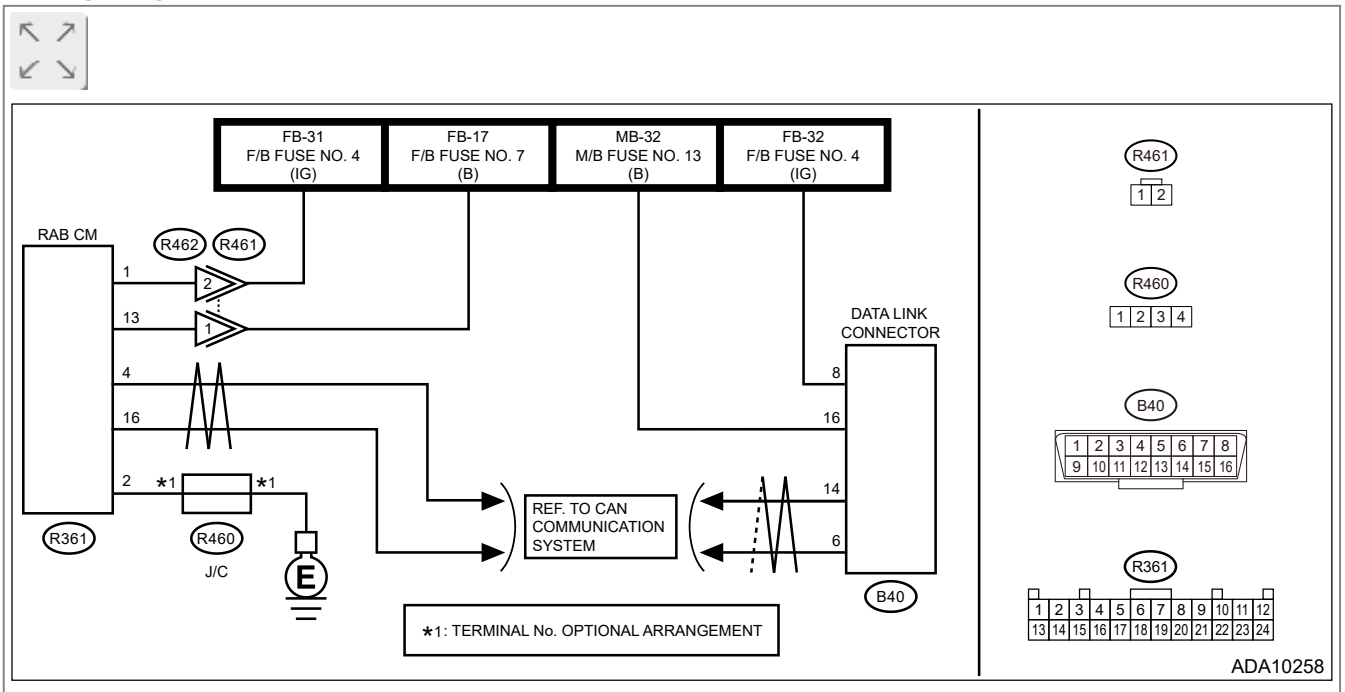
Trouble symptom:

Communication is not possible with [Reverse Automatic Braking].

Detecting condition:

- Defective harness connector
- Power supply circuit malfunction
- Defective RAB CM
- Defective CAN communication circuit
- Defective Subaru Select Monitor

Wiring diagram:



1. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse.

Is the check result OK?

Yes

[Go to 2.](#)

No

Replace the fuse. If the replaced fuse has blown out immediately, repair the short circuit to ground in harness between fuse — RAB CM.

ADA10258

2. CHECK POWER SUPPLY CIRCUIT.



1. Disconnect the RAB CM connector.
2. Turn the ignition switch to ON.
3. Using a tester, measure the voltage between the RAB CM connector and chassis ground.

Connector & terminal

(R361) No.1 (+) — Chassis ground (-):

(R361) No.13 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 3.](#)

No

Repair the open circuit in the harness between fuse and RAB CM connector.

3. CHECK GROUND CIRCUIT.



1. Turn the ignition switch to OFF.
2. Using a tester, measure the resistance between the RAB CM connector and chassis ground.

Connector & terminal

(R361) No.2 — Chassis ground:

Is the resistance 1 Ω or less?

Yes


 [Go to 4.](#)

No

Repair the open circuit of harness between RAB CM connector and chassis ground.

4. CHECK LAN SYSTEM.



1. Connect the RAB CM connector.
2. Inspect LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

Is the check result OK?

Yes

 [Go to 5.](#)

No

Perform the inspection according to the diagnosis for LAN system.


5. CHECK SUBARU SELECT MONITOR.



Connect the Subaru Select Monitor to another vehicle.

Is the communication possible with the vehicle?

Yes

 [Go to 6.](#)

No

Replace or repair the Subaru Select Monitor.

6. CHECK RAB CM.



Communicate with Reverse Automatic Braking.

Is communication possible?

Yes

The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

NOTE:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

Replace the RAB CM.

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C00 SONAR CONTROL MODULE CIRCUIT

Outline of diagnosis:

Detect the malfunction of the RAB CM.

Time needed for diagnosis:


10 ms

Recovery conditions:

Ignition switch OFF → ON

1. CHECK DTC.




Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is a DTC other than DTC B2B00 displayed? (Current malfunction)

Yes

Perform the diagnosis for DTC other than DTC B2B00.

No

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking_CM.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C01 RR SONAR CONTROL MODULE CIRCUIT

Outline of diagnosis:

Detect the malfunction of the RAB CM.

Time needed for diagnosis:


1200 ms

Recovery conditions:

Ignition switch OFF → ON

1. CHECK DTC.




Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is a DTC other than DTC B2C01 displayed? (Current malfunction)

Yes

Perform the diagnosis for DTC other than DTC B2C01.

No

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking_CM.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C02 RRC SONAR CONTROL MODULE CIRCUIT

Outline of diagnosis:

Detect the malfunction of the RAB CM.


Time needed for diagnosis:

1200 ms

Recovery conditions:

Ignition switch OFF → ON

1. CHECK DTC.


Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is a DTC other than DTC B2C02 displayed? (Current malfunction)

Yes

Perform the diagnosis for DTC other than DTC B2C02.

No

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking_CM.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C03 RL SONAR CONTROL MODULE CIRCUIT

Outline of diagnosis:

Detect the malfunction of the RAB CM.

Time needed for diagnosis:


1200 ms

Recovery conditions:

Ignition switch OFF → ON

1. CHECK DTC.




Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is a DTC other than DTC B2C03 displayed? (Current malfunction)

Yes

Perform the diagnosis for DTC other than DTC B2C03.

No

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking_CM.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C04 RLC SONAR CONTROL MODULE CIRCUIT

Outline of diagnosis:

Detect the malfunction of the RAB CM.

Time needed for diagnosis:


1200 ms (when four waves transmitted)

Recovery conditions:

Ignition switch OFF → ON

1. CHECK DTC.




Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is a DTC other than DTC B2C04 displayed? (Current malfunction)

Yes

Perform the diagnosis for DTC other than DTC B2C04.

No

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking_CM.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C05 SONAR CONTROL MODULE POWER SUPPLY

Outline of diagnosis:

Voltage supply to the ignition power supply terminal and the battery power supply terminal was 16 V or more.

Time needed for diagnosis:

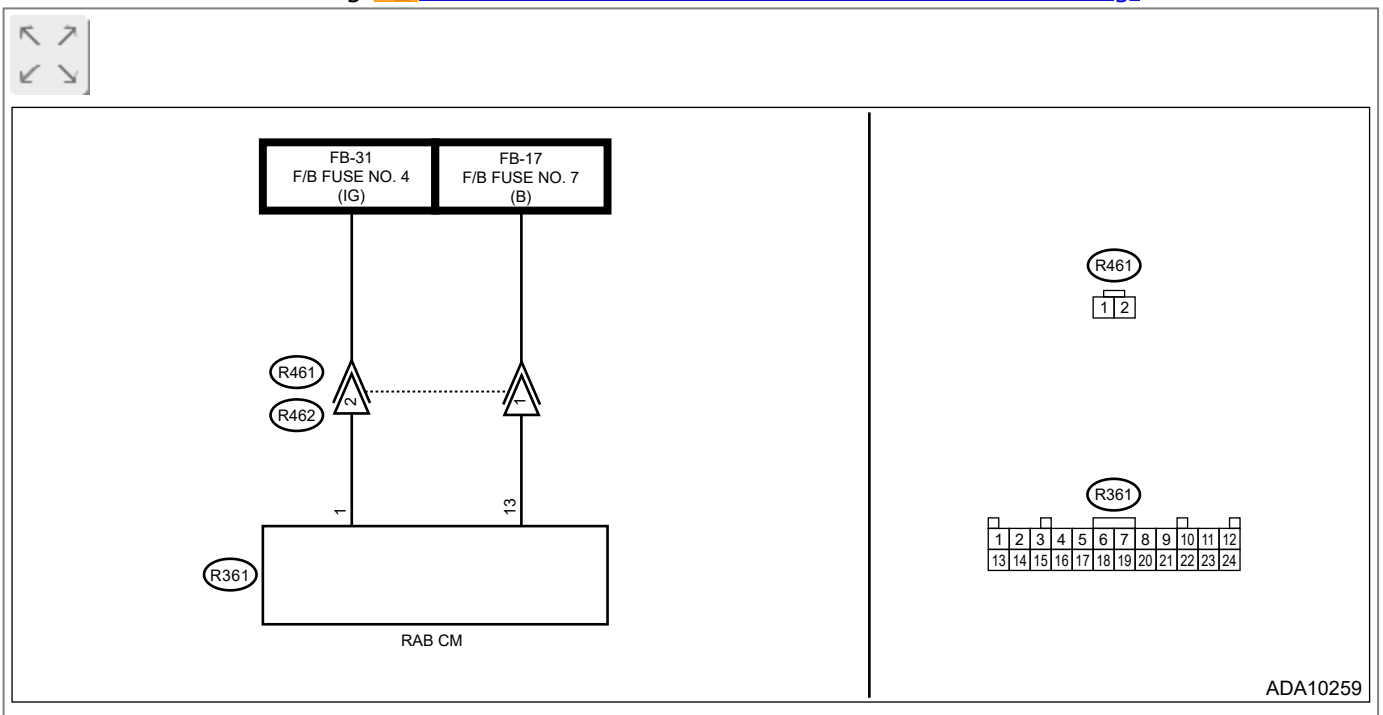
200 ms

Recovery conditions:


Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking  [Ref. to WIRING SYSTEM>Reverse Automatic Braking.](#)




1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the RAB CM connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C05 displayed? (Current malfunction)

Yes

 [Go to 2.](#)

No

Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

NOTE:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK RAB CM POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the RAB CM connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between the RAB CM connector and chassis ground.


Connector & terminal

(R361) No. 1 (+) — Chassis ground (-):

(R361) No. 13 (+) — Chassis ground (-):

Is the voltage 16 V or less?

Yes

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking CM.](#)

No

Check the harness between the RAB CM connector and power supply.

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C06 RR SONAR SENSOR CIRCUIT / NO SIGNAL

Outline of diagnosis:

Sonar sensor (right corner) harness is open.

Time needed for diagnosis:

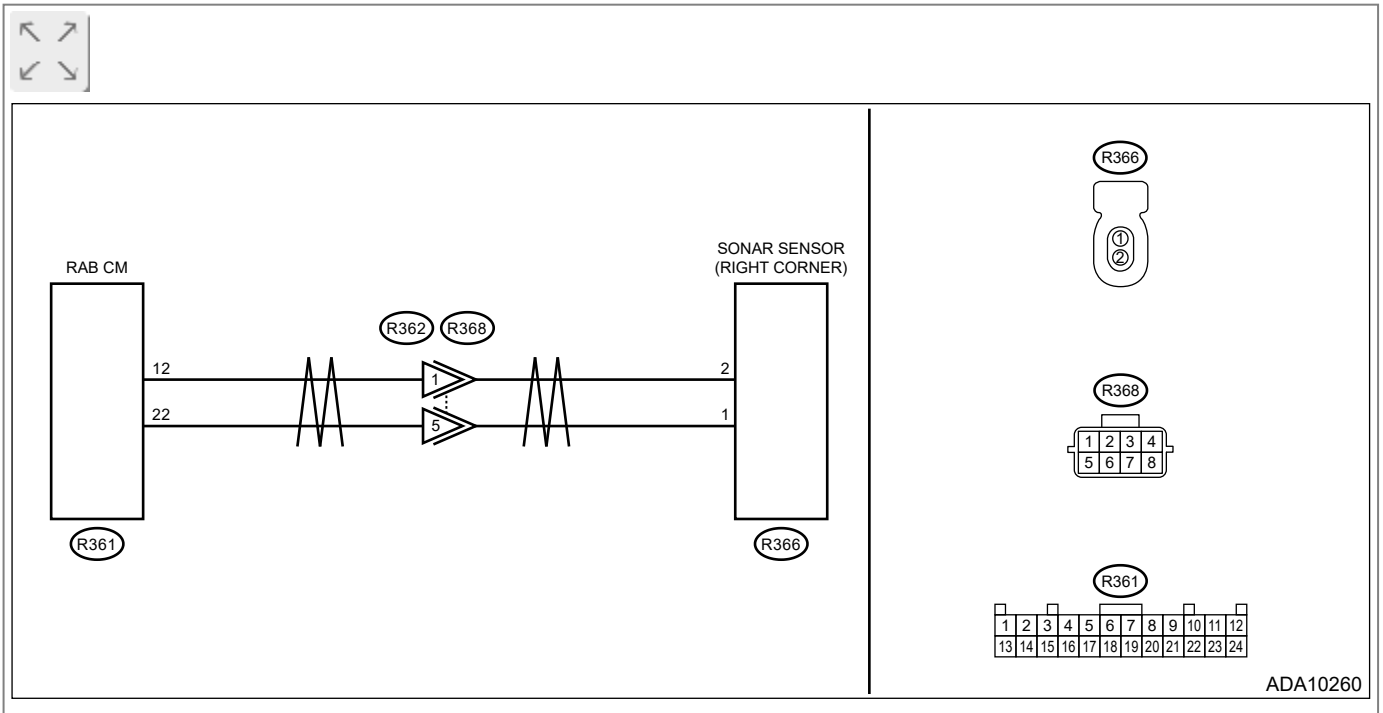
1200 ms

Recovery conditions:


Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking  [Ref. to WIRING SYSTEM>Reverse Automatic Braking.](#)




1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right corner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C06 displayed? (Current malfunction)

Yes

 [Go to 2.](#)

Even if DTC is displayed, the circuit has returned to a normal condition at this

No

time. Reproduce the failure, and then perform the diagnosis again.

NOTE:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right corner) connector and the RAB CM connector.
3. Using a tester, measure resistance value of the harness between the sonar sensor (right corner) connector and RAB CM connector.

Connector & terminal

(R361) No. 12 — (R366) No.1:

(R361) No. 22 — (R366) No.2:

Is the resistance less than 10 Ω ?


Yes

 [Go to 3.](#)

No


Repair or replace the open circuit in the harness between sonar sensor connector and RAB CM connector.

3. CHECK SONAR SENSOR.


1. Switch the sonar sensor (right corner) and sonar sensor (right inner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C06 displayed? (Current malfunction)

Yes

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking_CM.](#)


No

Replace the sensor installed as a sonar sensor (right corner).  [Ref. to REVERSE AUTOMATIC BRAKING>Sensor and Harness.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C07 RR SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT

Note:

For the diagnostic procedure, refer to DTC B2C06.  Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C06 RR SONAR SENSOR CIRCUIT / NO SIGNAL.

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C08 RRC SONAR SENSOR CIRCUIT / NO SIGNAL

Outline of diagnosis:

Sonar sensor (right inner) harness is open.

Time needed for diagnosis:

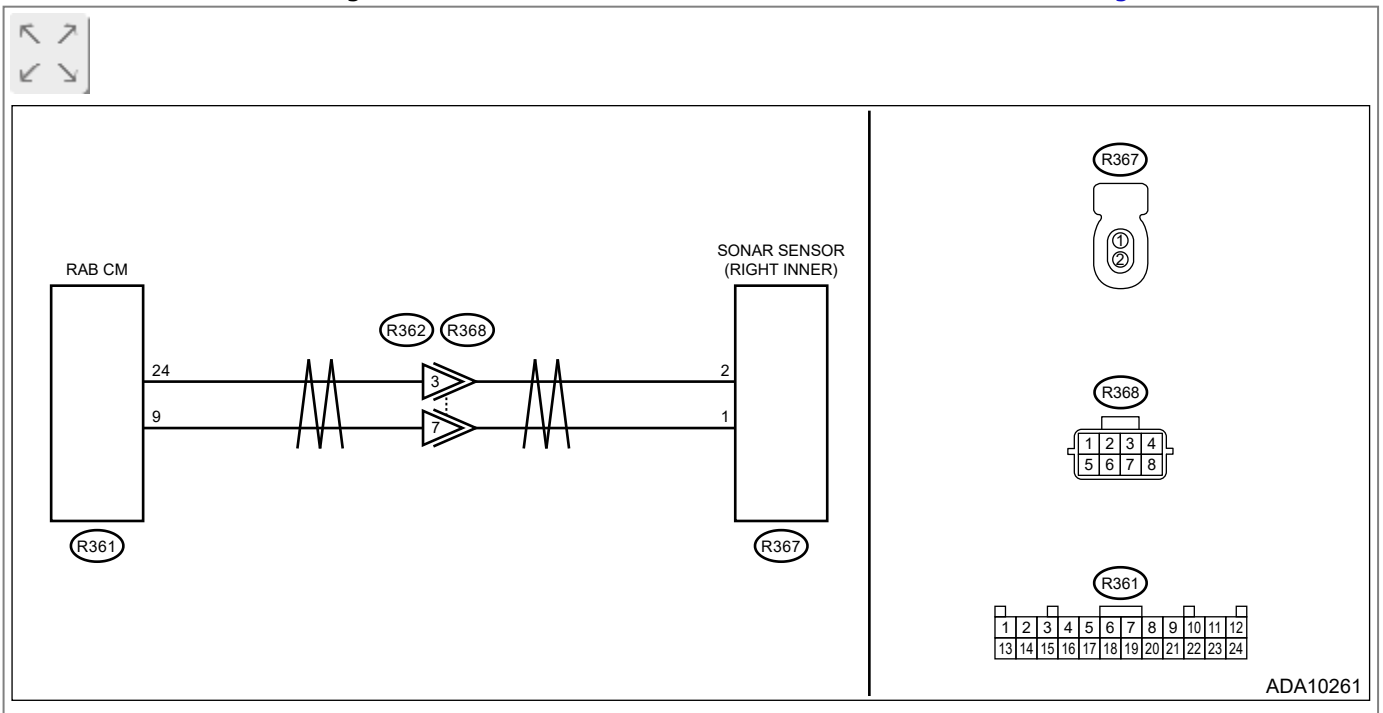
1200 ms

Recovery conditions:


Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking  [Ref. to WIRING SYSTEM>Reverse Automatic Braking.](#)




1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right inner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C08 displayed? (Current malfunction)

Yes

 [Go to 2.](#)

Even if DTC is displayed, the circuit has returned to a normal condition at this

No

time. Reproduce the failure, and then perform the diagnosis again.

NOTE:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (OPEN CIRCUIT).



1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right inner) connector and the RAB CM connector.
3. Using a tester, measure resistance value of the harness between the sonar sensor (right inner) connector and RAB CM connector.

Connector & terminal

(R361) No. 24 — (R367) No.2:

(R361) No. 9 — (R367) No.1:

Is the resistance less than 10 Ω?

Yes


 [Go to 3.](#)

No

Repair or replace the open circuit in the harness between sonar sensor connector and RAB CM connector.


3. CHECK SONAR SENSOR.




1. Switch the sonar sensor (right inner) and sonar sensor (right corner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C08 displayed? (Current malfunction)

Yes

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking CM.](#)


No

Replace the sensor installed as a sonar sensor (right inner).  [Ref. to REVERSE AUTOMATIC BRAKING>Sensor and Harness.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C09 RRC SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT

Note:

For the diagnostic procedure, refer to DTC B2C07.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2C07 RR SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C0A RL SONAR SENSOR CIRCUIT / NO SIGNAL

Outline of diagnosis:

Sonar sensor (left corner) harness is open.

Time needed for diagnosis:

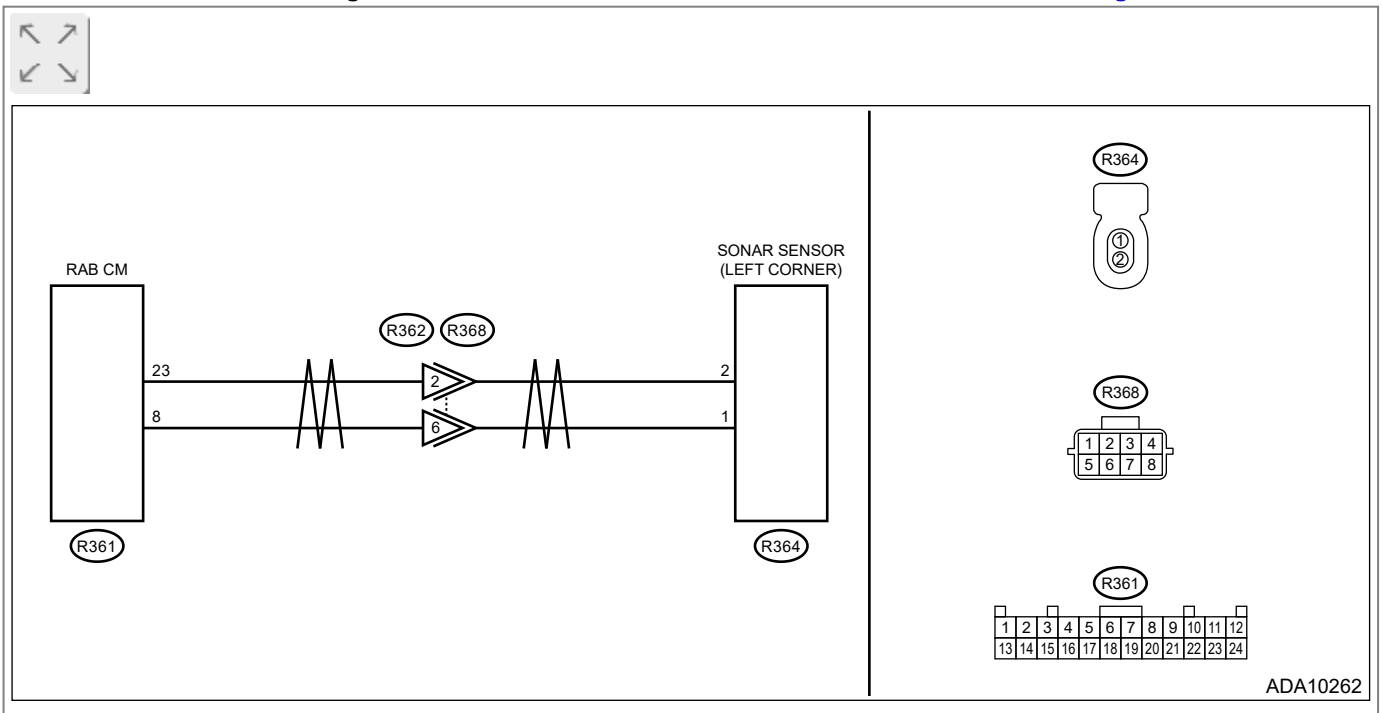
1200 ms

Recovery conditions:


Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking  [Ref. to WIRING SYSTEM>Reverse Automatic Braking.](#)




1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left corner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C0A displayed? (Current malfunction)

Yes

 [Go to 2.](#)

Even if DTC is displayed, the circuit has returned to a normal condition at this

No

time. Reproduce the failure, and then perform the diagnosis again.

NOTE:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left corner) connector and the RAB CM connector.
3. Using a tester, measure resistance value of the harness between the sonar sensor (left corner) connector and RAB CM connector.

Connector & terminal

(R361) No. 23 — (R364) No.2:

(R361) No. 8 — (R364) No.1:

Is the resistance less than 10 Ω ?


Yes

 [Go to 3.](#)

No


Repair or replace the open circuit in the harness between sonar sensor connector and RAB CM connector.

3. CHECK SONAR SENSOR.


1. Switch the sonar sensor (left corner) and sonar sensor (left inner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C0A displayed? (Current malfunction)

Yes

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking CM.](#)


No

Replace the sensor installed as a sonar sensor (left corner).  [Ref. to REVERSE AUTOMATIC BRAKING>Sensor and Harness.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C0B RL SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT

Note:

For the diagnostic procedure, refer to DTC B2C0A.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2C0A RL SONAR SENSOR CIRCUIT / NO SIGNAL.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C0C RLC SONAR SENSOR CIRCUIT / NO SIGNAL

Outline of diagnosis:

Sonar sensor (left inner) harness is open.

Time needed for diagnosis:

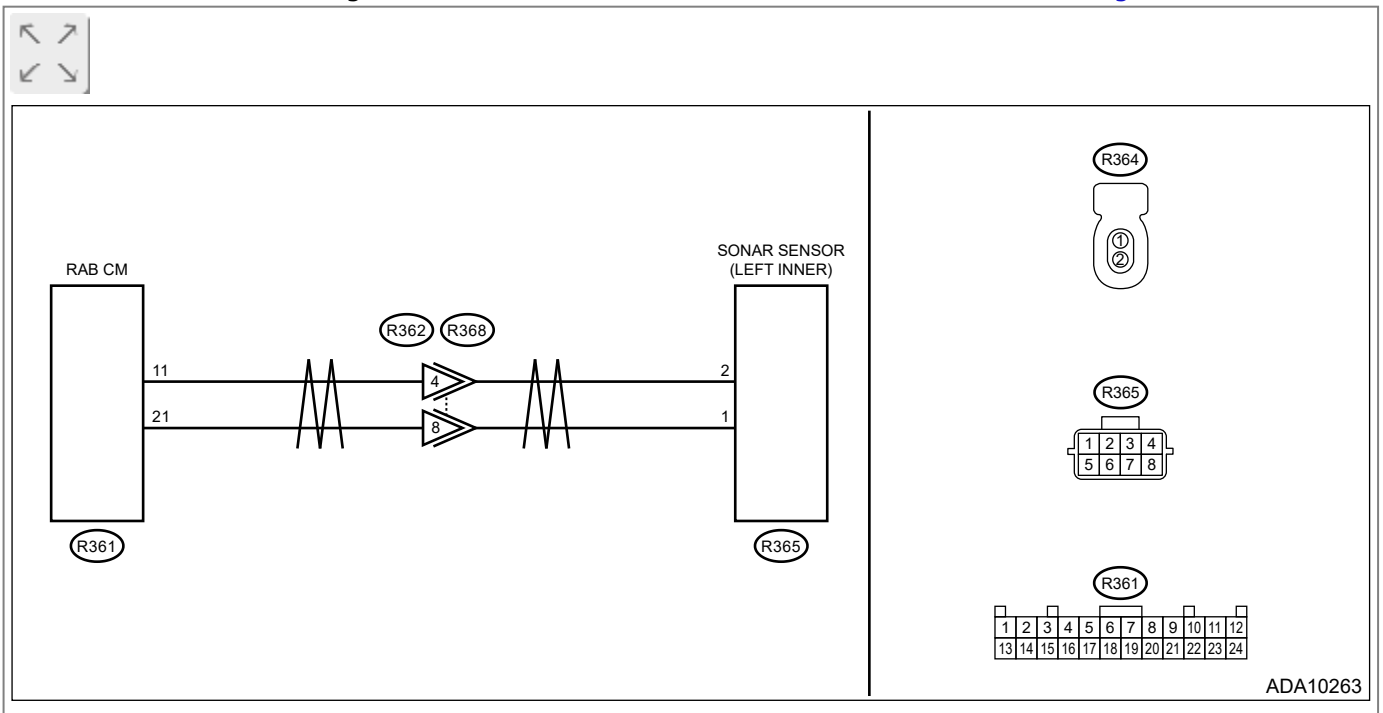
1200 ms

Recovery conditions:


Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking  [Ref. to WIRING SYSTEM>Reverse Automatic Braking.](#)




1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left inner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C0C displayed? (Current malfunction)

Yes

 [Go to 2.](#)

Even if DTC is displayed, the circuit has returned to a normal condition at this

No

time. Reproduce the failure, and then perform the diagnosis again.

NOTE:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (OPEN CIRCUIT).



1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left inner) connector and the RAB CM connector.
3. Using a tester, measure resistance value of the harness between the sonar sensor (left inner) connector and RAB CM connector.

Connector & terminal

(R361) No. 11 — (R365) No.2:

(R361) No. 21 — (R365) No.1:

Is the resistance less than 10 Ω ?

Yes


 [Go to 3.](#)

No

Repair or replace the open circuit in the harness between sonar sensor connector and RAB CM connector.


3. CHECK SONAR SENSOR.




1. Switch the sonar sensor (left inner) and sonar sensor (left corner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C0C displayed? (Current malfunction)

Yes

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking CM.](#)


No

Replace the sensor installed as a sonar sensor (left inner).  [Ref. to REVERSE AUTOMATIC BRAKING>Sensor and Harness.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C0D RLC SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT

Note:

For the diagnostic procedure, refer to DTC B2C0C.  Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C0C RLC SONAR SENSOR CIRCUIT / NO SIGNAL.

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C0E RR SONAR HARNESS HIGH

Outline of diagnosis:

Sonar sensor (right corner) harness is shorted to power supply.

Time needed for diagnosis:

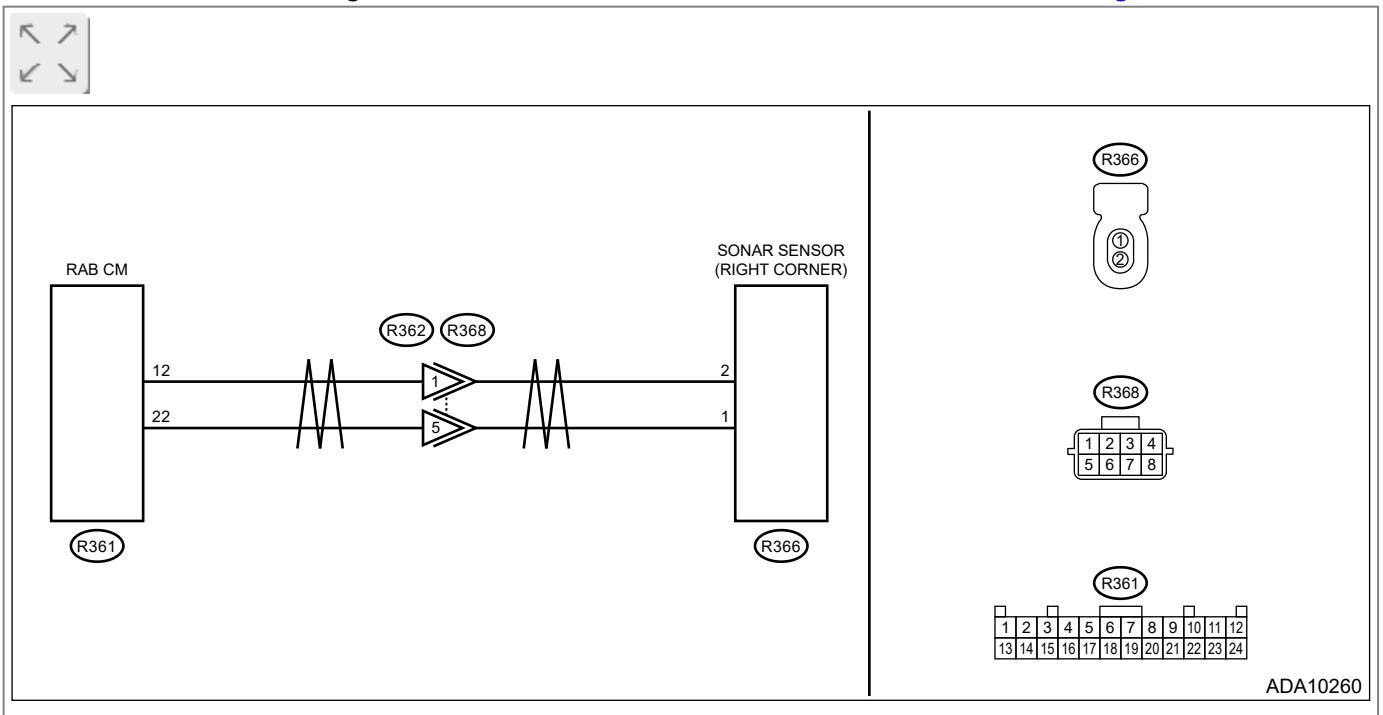
1200 ms

Recovery conditions:


Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking  [Ref. to WIRING SYSTEM>Reverse Automatic Braking.](#)




1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right corner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C0E displayed? (Current malfunction)

Yes

 [Go to 2.](#)

Even if DTC is displayed, the circuit has returned to a normal condition at this

No

time. Reproduce the failure, and then perform the diagnosis again.

NOTE:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (SHORT CIRCUIT TO POWER SUPPLY).



1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right corner) connector and the RAB CM connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between sonar sensor (right corner) connector and chassis ground.

Connector & terminal

(R366) No.1 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes


 [Go to 3.](#)

No

Repair or replace the short circuit in the harness between sonar sensor connector and RAB CM connector.


3. CHECK SONAR SENSOR.




1. Turn the ignition switch to OFF.
2. Switch the sonar sensor (right corner) and sonar sensor (right inner).
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C0E displayed? (Current malfunction)

Yes

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking CM.](#)

No

Replace the sensor installed as a sonar sensor (right corner).  [Ref. to REVERSE AUTOMATIC BRAKING>Sensor and Harness.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C0F RR SONAR HARNESS LOW

Outline of diagnosis:

Sonar sensor (right corner) harness is shorted to ground.

Time needed for diagnosis:

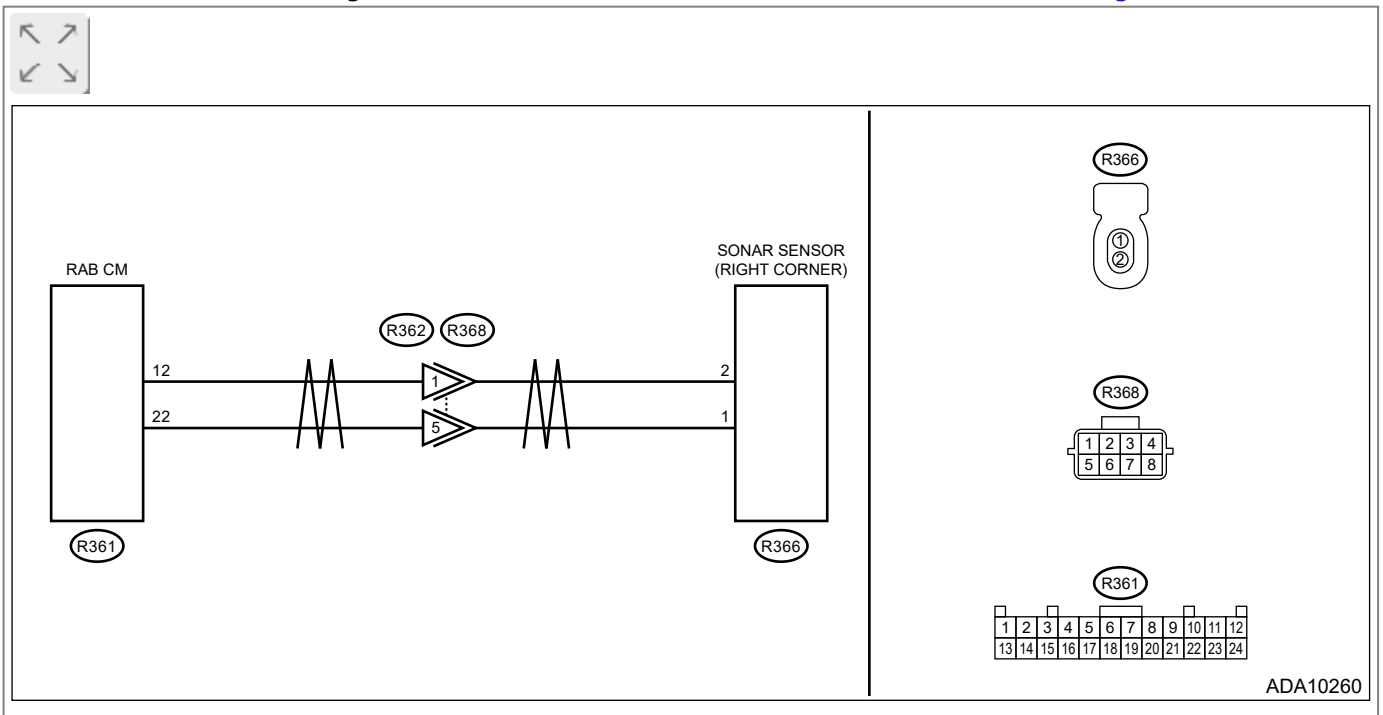
1200 ms

Recovery conditions:


Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking  [Ref. to WIRING SYSTEM>Reverse Automatic Braking.](#)




1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right corner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C0F displayed? (Current malfunction)

Yes

 [Go to 2.](#)

Even if DTC is displayed, the circuit has returned to a normal condition at this

No

time. Reproduce the failure, and then perform the diagnosis again.

NOTE:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (SHORTED TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right corner) connector and the RAB CM connector.
3. Using a tester, measure the resistance between sonar sensor (right corner) connector and chassis ground.

Connector & terminal

(R366) No.1 — Chassis ground:

Is the resistance 1 MΩ or more?


Yes

 [Go to 3.](#)

No


Repair or replace the short circuit in the harness between sonar sensor connector and RAB CM connector.

3. CHECK SONAR SENSOR.


1. Switch the sonar sensor (right corner) and sonar sensor (right inner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C0F displayed? (Current malfunction)

Yes

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking_CM.](#)

No

Replace the sensor installed as a sonar sensor (right corner).  [Ref. to REVERSE AUTOMATIC BRAKING>Sensor and Harness.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C10 RRC SONAR HARNESS HIGH

Outline of diagnosis:

Sonar sensor (right inner) harness is shorted to power supply.

Time needed for diagnosis:

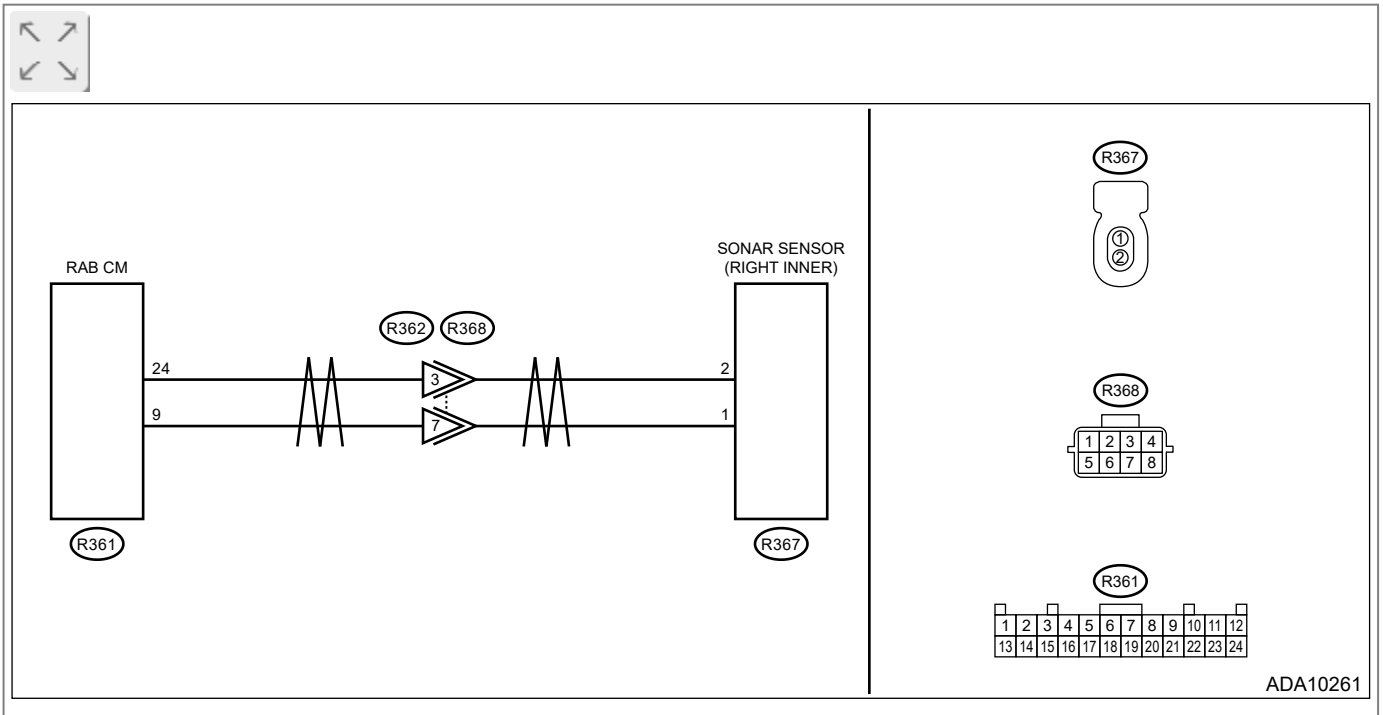
1200 ms

Recovery conditions:


Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking  [Ref. to WIRING SYSTEM>Reverse Automatic Braking.](#)



1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right inner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C10 displayed? (Current malfunction)

Yes  [Go to 2.](#)

Even if DTC is displayed, the circuit has returned to a normal condition at this

No

time. Reproduce the failure, and then perform the diagnosis again.

NOTE:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (SHORT CIRCUIT TO POWER SUPPLY).



1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right inner) connector and the RAB CM connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between sonar sensor (right inner) connector and chassis ground.

Connector & terminal

(R367) No.2 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes


 [Go to 3.](#)

No

Repair or replace the short circuit in the harness between sonar sensor connector and RAB CM connector.


3. CHECK SONAR SENSOR.




1. Turn the ignition switch to OFF.
2. Switch the sonar sensor (right inner) and sonar sensor (right corner).
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C10 displayed? (Current malfunction)

Yes

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking CM.](#)

No

Replace the sensor installed as a sonar sensor (right inner).  [Ref. to REVERSE AUTOMATIC BRAKING>Sensor and Harness.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C11 RRC SONAR HARNESS LOW

Outline of diagnosis:

Sonar sensor (right inner) harness is shorted to ground.

Time needed for diagnosis:

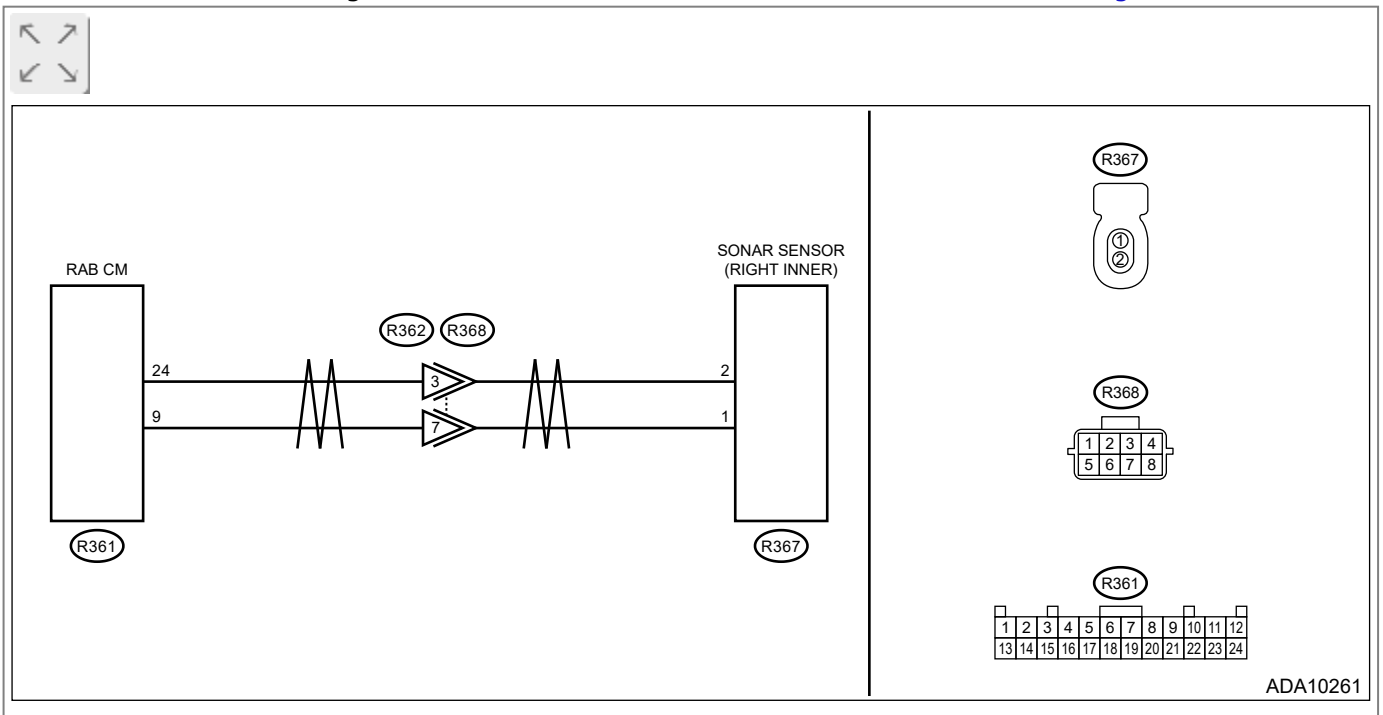
1200 ms

Recovery conditions:


Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking  [Ref. to WIRING SYSTEM>Reverse Automatic Braking.](#)




1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right inner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C11 displayed? (Current malfunction)

Yes

 [Go to 2.](#)

Even if DTC is displayed, the circuit has returned to a normal condition at this

No

time. Reproduce the failure, and then perform the diagnosis again.

NOTE:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (SHORTED TO GROUND).


1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right inner) connector and the RAB CM connector.
3. Using a tester, measure the resistance between sonar sensor (right inner) connector and chassis ground.

Connector & terminal

(R367) No.2 — Chassis ground:

Is the resistance 1 MΩ or more?


Yes

 [Go to 3.](#)

No


Repair or replace the short circuit in the harness between sonar sensor connector and RAB CM connector.

3. CHECK SONAR SENSOR.


1. Switch the sonar sensor (right inner) and sonar sensor (right corner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C11 displayed? (Current malfunction)

Yes

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking_CM.](#)

No

Replace the sensor installed as a sonar sensor (right inner).  [Ref. to REVERSE AUTOMATIC BRAKING>Sensor and Harness.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C12 RL SONAR HARNESS HIGH

Outline of diagnosis:

Sonar sensor (left corner) harness is shorted to power supply.

Time needed for diagnosis:

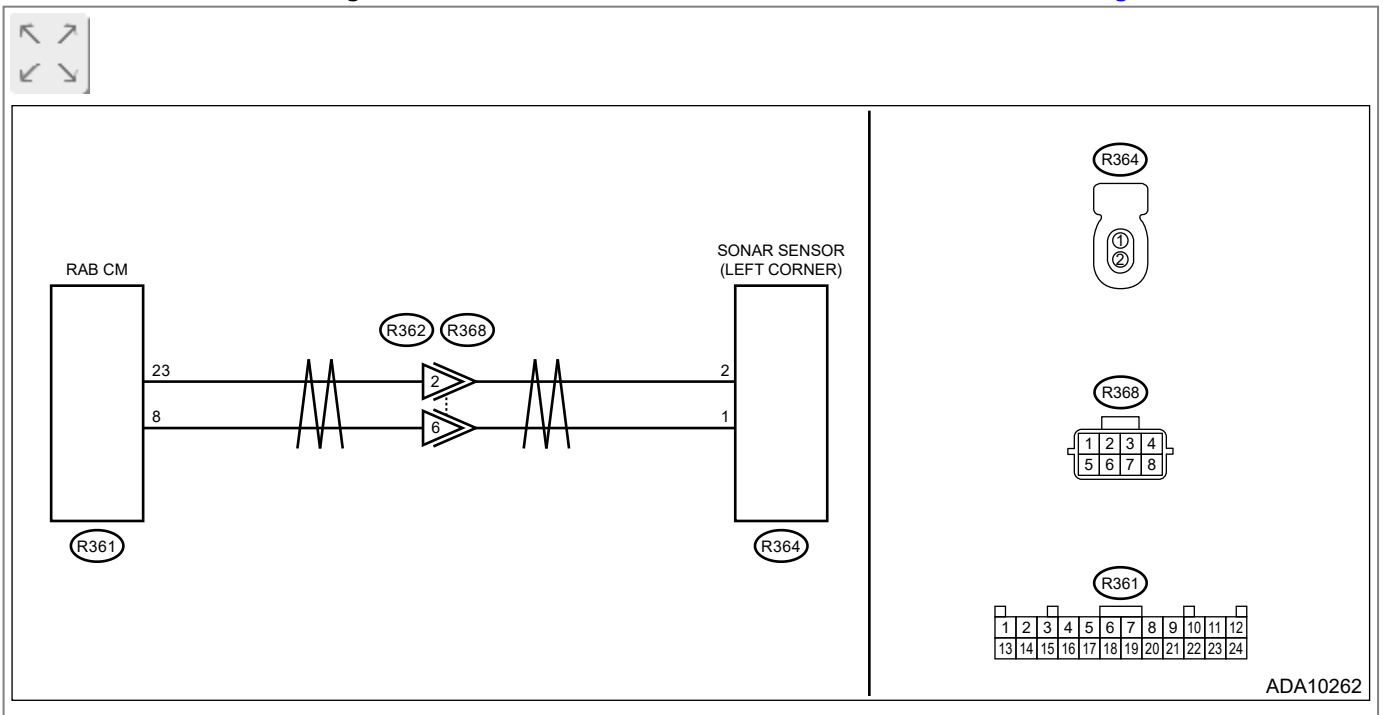
1200 ms

Recovery conditions:


Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking  [Ref. to WIRING SYSTEM>Reverse Automatic Braking.](#)




1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left corner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C12 displayed? (Current malfunction)

Yes

 [Go to 2.](#)

Even if DTC is displayed, the circuit has returned to a normal condition at this

No

time. Reproduce the failure, and then perform the diagnosis again.

NOTE:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (SHORT CIRCUIT TO POWER SUPPLY).



1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left corner) connector and the RAB CM connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between sonar sensor (left corner) connector and chassis ground.

Connector & terminal

(R364) No.2 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes


 [Go to 3.](#)

No

Repair or replace the short circuit in the harness between sonar sensor connector and RAB CM connector.


3. CHECK SONAR SENSOR.




1. Turn the ignition switch to OFF.
2. Switch the sonar sensor (left corner) and sonar sensor (left inner).
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C12 displayed? (Current malfunction)

Yes

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking CM.](#)

No

Replace the sensor installed as a sonar sensor (left corner).  [Ref. to REVERSE AUTOMATIC BRAKING>Sensor and Harness.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C13 RL SONAR HARNESS LOW

Outline of diagnosis:

Sonar sensor (left corner) harness is shorted to ground.

Time needed for diagnosis:

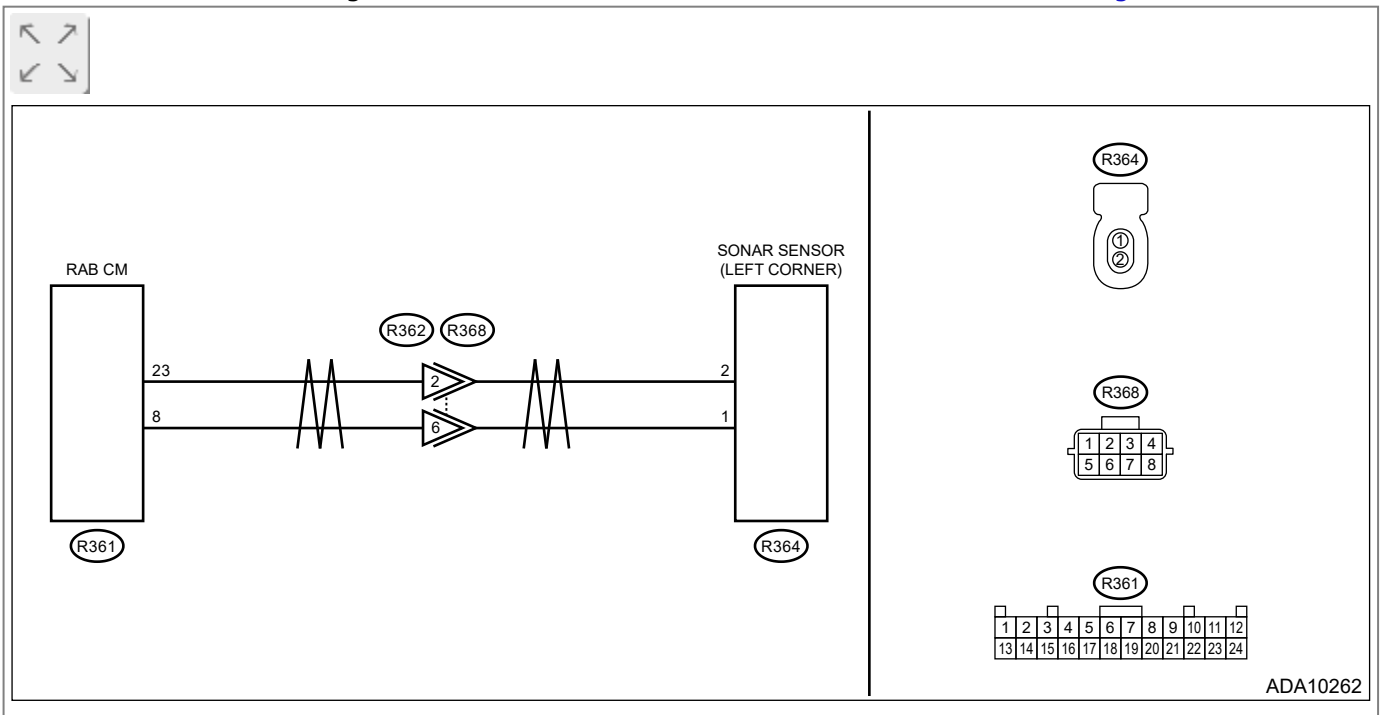
1200 ms

Recovery conditions:


Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking  [Ref. to WIRING SYSTEM>Reverse Automatic Braking.](#)




1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left corner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C13 displayed? (Current malfunction)

Yes

 [Go to 2.](#)

Even if DTC is displayed, the circuit has returned to a normal condition at this

No

time. Reproduce the failure, and then perform the diagnosis again.

NOTE:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (SHORTED TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left corner) connector and the RAB CM connector.
3. Using a tester, measure the resistance between sonar sensor (left corner) connector and chassis ground.

Connector & terminal

(R364) No.2 — Chassis ground:

Is the resistance 1 MΩ or more?


Yes

 [Go to 3.](#)

No


Repair or replace the short circuit in the harness between sonar sensor connector and RAB CM connector.

3. CHECK SONAR SENSOR.


1. Switch the sonar sensor (left corner) and sonar sensor (left inner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C13 displayed? (Current malfunction)

Yes

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking_CM.](#)

No

Replace the sensor installed as a sonar sensor (left corner).  [Ref. to REVERSE AUTOMATIC BRAKING>Sensor and Harness.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C14 RLC SONAR HARNESS HIGH

Outline of diagnosis:

Sonar sensor (left inner) harness is shorted to power supply.

Time needed for diagnosis:

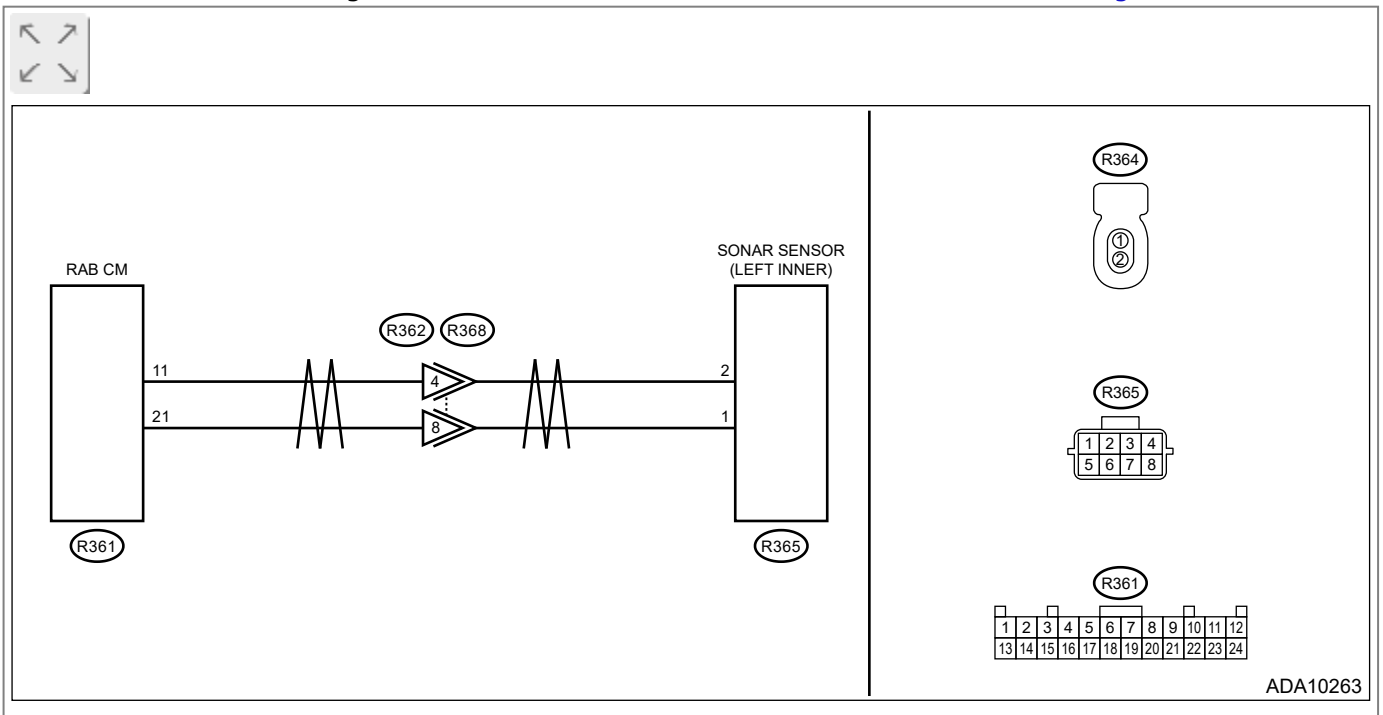
1200 ms

Recovery conditions:


Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking  [Ref. to WIRING SYSTEM>Reverse Automatic Braking.](#)




1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left inner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C14 displayed? (Current malfunction)

Yes

 [Go to 2.](#)

Even if DTC is displayed, the circuit has returned to a normal condition at this

No

time. Reproduce the failure, and then perform the diagnosis again.

NOTE:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (SHORT CIRCUIT TO POWER SUPPLY).



1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left inner) connector and the RAB CM connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between sonar sensor (left inner) connector and chassis ground.

Connector & terminal

(R365) No.2 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes


 [Go to 3.](#)

No

Repair or replace the short circuit in the harness between sonar sensor connector and RAB CM connector.


3. CHECK SONAR SENSOR.




1. Turn the ignition switch to OFF.
2. Switch the sonar sensor (left inner) and sonar sensor (left corner).
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C14 displayed? (Current malfunction)

Yes

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking CM.](#)

No

Replace the sensor installed as a sonar sensor (left inner).  [Ref. to REVERSE AUTOMATIC BRAKING>Sensor and Harness.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C15 RLC SONAR HARNESS LOW

Outline of diagnosis:

Sonar sensor (left inner) harness is shorted to ground.

Time needed for diagnosis:

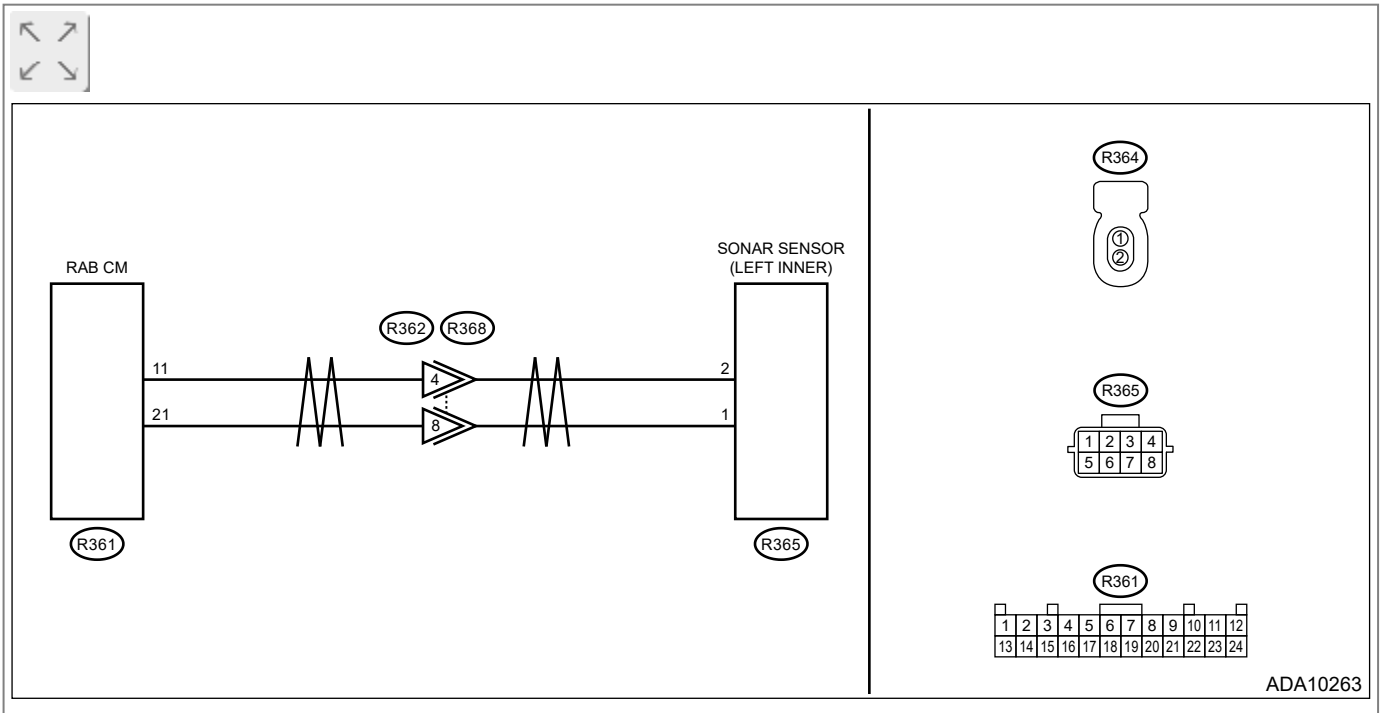
1200 ms

Recovery conditions:


Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking  [Ref. to WIRING SYSTEM>Reverse Automatic Braking.](#)



1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left inner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C15 displayed? (Current malfunction)

Yes  [Go to 2.](#)

Even if DTC is displayed, the circuit has returned to a normal condition at this

No

time. Reproduce the failure, and then perform the diagnosis again.

NOTE:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (SHORTED TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left inner) connector and the RAB CM connector.
3. Using a tester, measure the resistance between sonar sensor (left inner) connector and chassis ground.

Connector & terminal

(R365) No.2 — Chassis ground:

Is the resistance 1 MΩ or more?


Yes

 [Go to 3.](#)

No


Repair or replace the short circuit in the harness between sonar sensor connector and RAB CM connector.

3. CHECK SONAR SENSOR.


1. Switch the sonar sensor (left inner) and sonar sensor (left corner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C15 displayed? (Current malfunction)

Yes

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking_CM.](#)


No

Replace the sensor installed as a sonar sensor (left inner).  [Ref. to REVERSE AUTOMATIC BRAKING>Sensor and Harness.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C16 RRC SONAR HARNESS HIGH / RRC SONAR CONTROL MODULE CIRCUIT


Note:

For the diagnostic procedure, refer to DTC B2C10.  Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C10 RRC SONAR HARNESS HIGH.

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C17 RLC SONAR HARNESS HIGH / RLC SONAR CONTROL MODULE CIRCUIT


Note:

For the diagnostic procedure, refer to DTC B2C14.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2C14 RLC SONAR HARNESS HIGH.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C18 RR SONAR HARNESS HIGH / RR SONAR CONTROL MODULE CIRCUIT


Note:

For the diagnostic procedure, refer to DTC B2C0E.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2C0E RR SONAR HARNESS HIGH.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C19 RL SONAR HARNESS HIGH / RL SONAR CONTROL MODULE CIRCUIT

Note:

For the diagnostic procedure, refer to DTC B2C12.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2C12 RL SONAR HARNESS HIGH.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C1A RRC SONAR SENSOR

Outline of diagnosis:

Sonar sensor (right inner) is faulty.

Time needed for diagnosis:

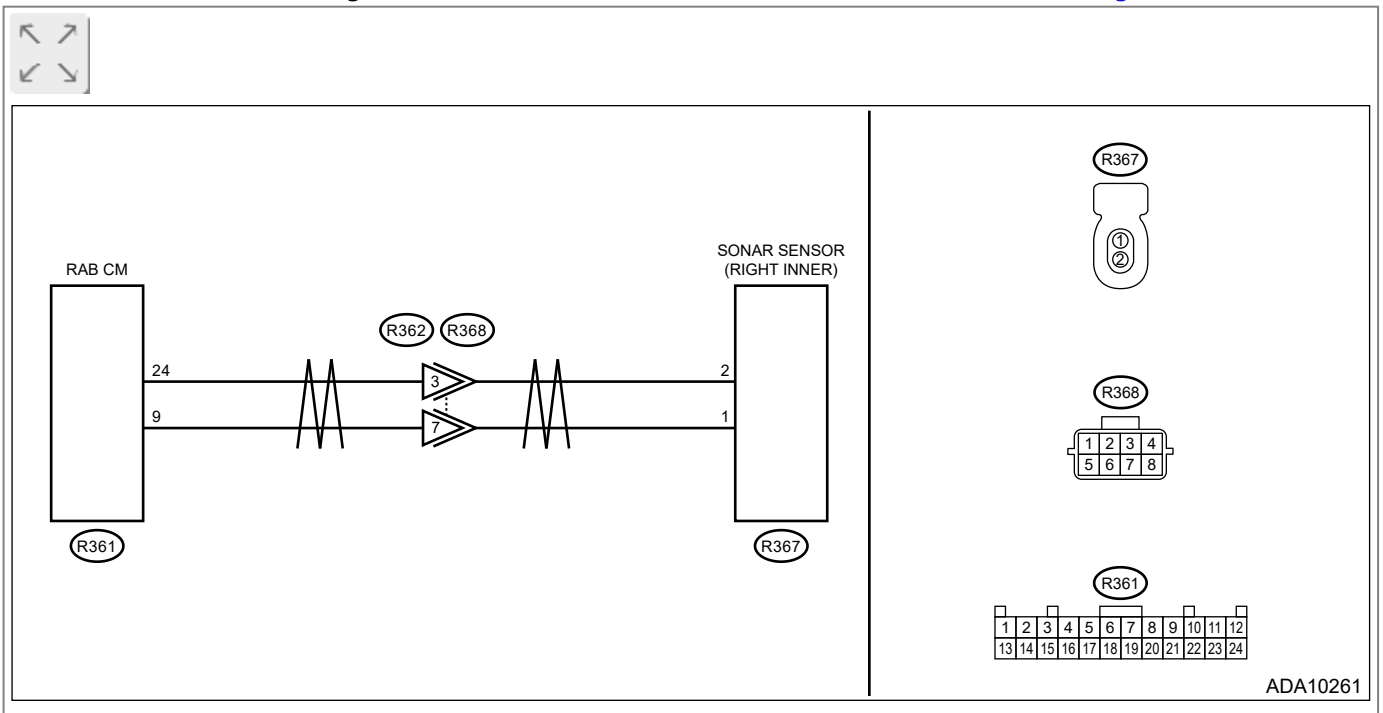
1200 ms

Recovery conditions:


Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking  [Ref. to WIRING SYSTEM>Reverse Automatic Braking.](#)




1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right inner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C1A displayed? (Current malfunction)

Yes

 [Go to 2.](#)

Even if DTC is displayed, the circuit has returned to a normal condition at this

No


time. Reproduce the failure, and then perform the diagnosis again.

NOTE:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.


2. CHECK SONAR SENSOR.




1. Switch the sonar sensor (right inner) and sonar sensor (right corner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C1A displayed? (Current malfunction)

Yes

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking CM.](#)

No

Replace the sensor installed as a sonar sensor (right inner).  [Ref. to REVERSE AUTOMATIC BRAKING>Sensor and Harness.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C1B RLC SONAR SENSOR

Outline of diagnosis:

Sonar sensor (left inner) is faulty.

Time needed for diagnosis:

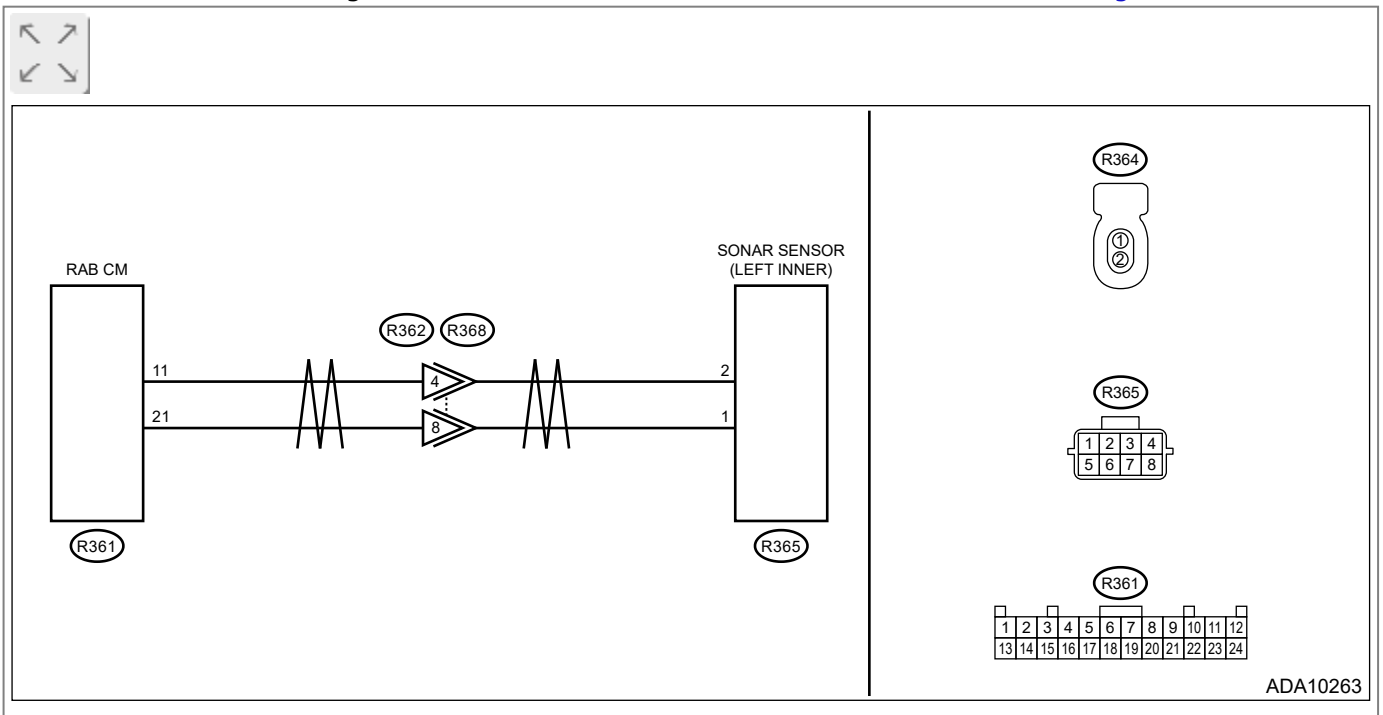
1200 ms

Recovery conditions:


Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking  [Ref. to WIRING SYSTEM>Reverse Automatic Braking.](#)




1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left inner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C1B displayed? (Current malfunction)

Yes

 [Go to 2.](#)

Even if DTC is displayed, the circuit has returned to a normal condition at this

No


time. Reproduce the failure, and then perform the diagnosis again.

NOTE:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.


2. CHECK SONAR SENSOR.




1. Switch the sonar sensor (left inner) and sonar sensor (left corner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C1B displayed? (Current malfunction)

Yes

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking CM.](#)

No

Replace the sensor installed as a sonar sensor (left inner).  [Ref. to REVERSE AUTOMATIC BRAKING>Sensor and Harness.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C1C RR SONAR SENSOR

Outline of diagnosis:

Sonar sensor (right corner) is faulty.

Time needed for diagnosis:

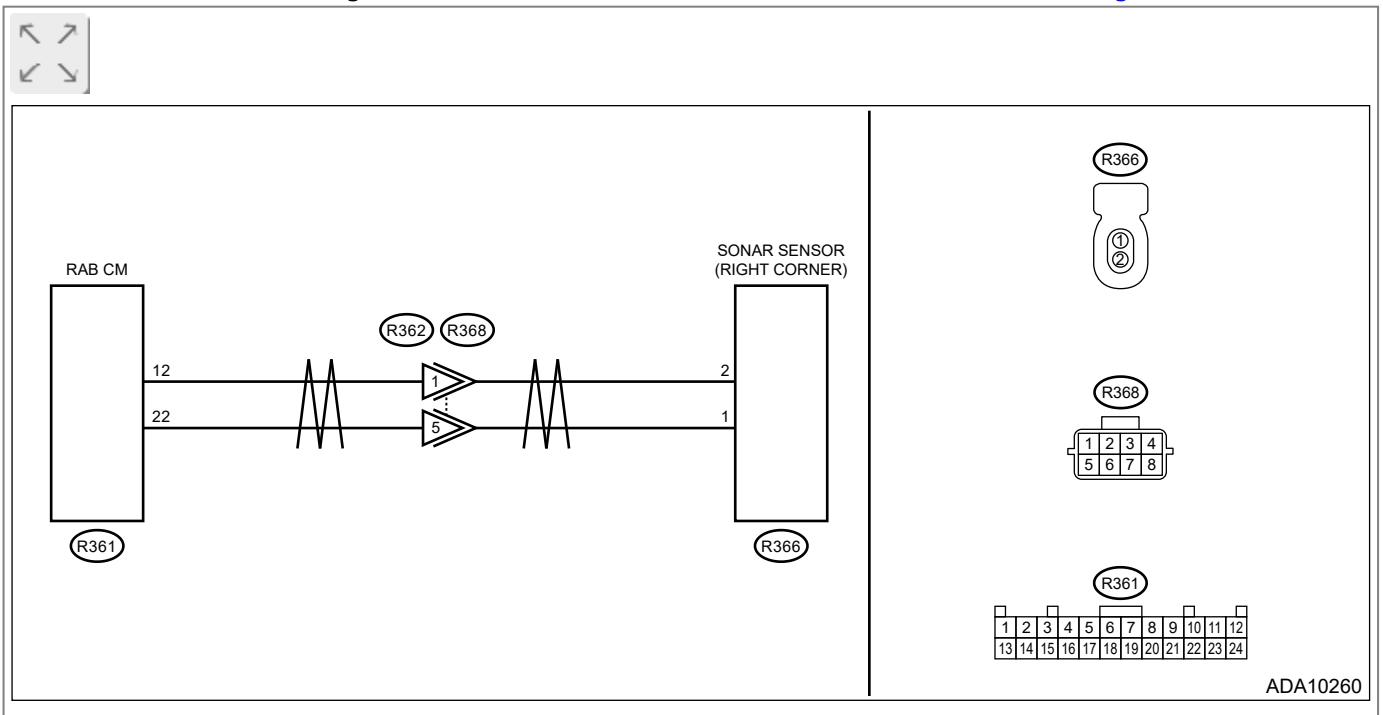
1200 ms

Recovery conditions:


Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking  [Ref. to WIRING SYSTEM>Reverse Automatic Braking.](#)




1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right corner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C1C displayed? (Current malfunction)

Yes

 [Go to 2.](#)

Even if DTC is displayed, the circuit has returned to a normal condition at this

No


time. Reproduce the failure, and then perform the diagnosis again.

NOTE:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.


2. CHECK SONAR SENSOR.




1. Switch the sonar sensor (right corner) and sonar sensor (right inner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C1C displayed? (Current malfunction)

Yes

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking_CM.](#)

No

Replace the sensor installed as a sonar sensor (right corner).  [Ref. to REVERSE AUTOMATIC BRAKING>Sensor and Harness.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C1D RL SONAR SENSOR

Outline of diagnosis:

Sonar sensor (left corner) is faulty.

Time needed for diagnosis:

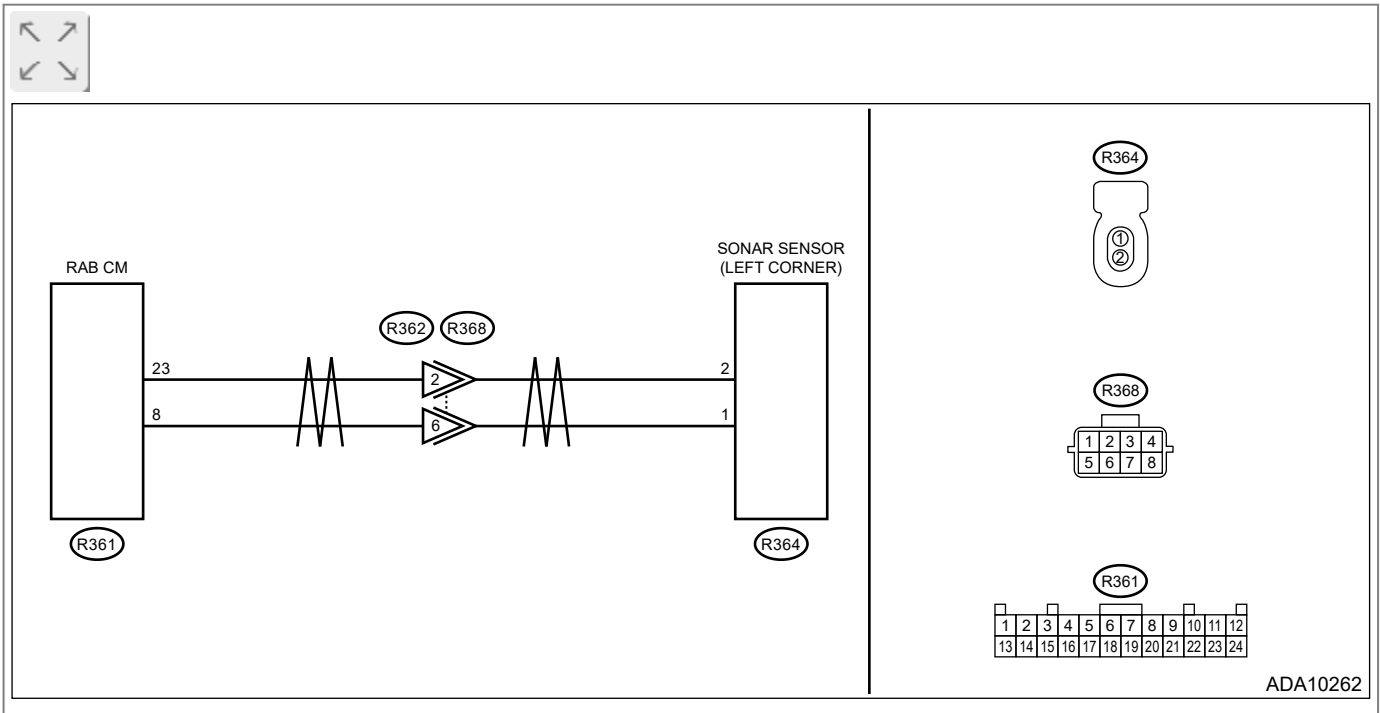
1200 ms

Recovery conditions:

Ignition switch OFF → ON


Wiring diagram:

Reverse Automatic Braking  [Ref. to WIRING SYSTEM>Reverse Automatic Braking.](#)



ADA10262

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left corner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C1D displayed? (Current malfunction)

Yes

 [Go to 2.](#)

Even if DTC is displayed, the circuit has returned to a normal condition at this

No


time. Reproduce the failure, and then perform the diagnosis again.

NOTE:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.


2. CHECK SONAR SENSOR.




1. Switch the sonar sensor (left corner) and sonar sensor (left inner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of Reverse Automatic Braking using the Subaru Select Monitor.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2C1D displayed? (Current malfunction)

Yes

Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking CM.](#)


No

Replace the sensor installed as a sonar sensor (left corner).  [Ref. to REVERSE AUTOMATIC BRAKING>Sensor and Harness.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C1E RRC SONAR HARNESS LOW / RRC SONAR CONTROL MODULE CIRCUIT


Note:

For the diagnostic procedure, refer to DTC B2C11.  Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C11 RRC SONAR HARNESS LOW.

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C1F RLC SONAR HARNESS LOW / RLC SONAR CONTROL MODULE CIRCUIT


Note:

For the diagnostic procedure, refer to DTC B2C15.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2C15 RLC SONAR HARNESS LOW.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C20 RR SONAR HARNESS LOW / RR SONAR CONTROL MODULE CIRCUIT


Note:

For the diagnostic procedure, refer to DTC B2C0F.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2C0F RR SONAR HARNESS LOW.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C21 RL SONAR HARNESS LOW / RL SONAR CONTROL MODULE CIRCUIT

Note:

For the diagnostic procedure, refer to DTC B2C13.  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2C13 RL SONAR HARNESS LOW.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C22 EYESIGHT SYSTEM

Outline of diagnosis:

EyeSight is faulty.

Time needed for diagnosis:

800 ms

Recovery conditions:

Ignition switch OFF → ON

Note:

Perform the diagnosis for EyeSight.  [Ref. to EyeSight \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0077 LOCAL CAN COMMUNICATION BUS OFF

Outline of diagnosis:

Local communication is faulty.


Time needed for diagnosis:

500 ms

Recovery conditions:

Ignition switch OFF → ON

1. CHECK DTC.


Using the Subaru Select Monitor, read DTC of [Reverse Automatic Braking].  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is a DTC other than DTC U0077 displayed? (Current malfunction)

Yes

Perform the diagnosis for DTC other than DTC U0077.

No


Replace the RAB CM.  [Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking_CM.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

Detected when CAN data from ECM does not arrive.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM

Detected when CAN data from TCM does not arrive.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

Detected when CAN data from VDC does not arrive.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE

Detected when CAN data is not received from body integrated unit.

Note:


Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0156 LOST COMMUNICATION WITH INFORMATION CENTER "A"

Detected when CAN data from MFD does not arrive.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"

Detected when CAN data from ECM is abnormal.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0402 INVALID DATA RECEIVED FROM TCM

This is detected when CAN data from TCM is abnormal.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

Detected when CAN data from VDC is abnormal.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0457 INVALID DATA RECEIVED FROM INFORMATION CENTER "A"

Detected when CAN data from MFD is abnormal.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1235 LOST COMMUNICATION WITH EYESIGHT

Detected when CAN data from the stereo camera does not arrive.

Note:


Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1433 INVALID DATA RECEIVED FROM EYESIGHT










Detected when CAN data from stereo camera is abnormal.












Note:











Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)











REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)










LIST

DTC	Description & trouble position	Reference
U0077	CAN failure, bus off detection (local)	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0077 LOCAL CAN COMMUNICATION BUS OFF.
U0100	Engine data not yet arrived	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0101	Transmission data not yet arrived	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0122	VDC data not yet arrived	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0155	Meter data not yet arrived	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0156	CAN (MFD) data not yet arrived	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0156 LOST COMMUNICATION WITH INFORMATION CENTER "A".
U1235	EyeSight data not yet arrived	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1235 LOST COMMUNICATION WITH EyeSight.
U0140	Body integrated unit data not yet arrived	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0401	Engine data abnormality	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".

U0402	Transmission data abnormality	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0402 INVALID DATA RECEIVED FROM TCM.
U0416	VDC data abnormality	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0423	Meter data abnormality	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.
U0457	MFD data abnormality	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0457 INVALID DATA RECEIVED FROM INFORMATION CENTER "A".
U1433	EyeSight data abnormality	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1433 INVALID DATA RECEIVED FROM EyeSight.
B2C00	SONAR CONTROL MODULE CIRCUIT	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C00 SONAR CONTROL MODULE CIRCUIT.
B2C01	RR SONAR CONTROL MODULE CIRCUIT	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C01 RR SONAR CONTROL MODULE CIRCUIT.
B2C02	RRC SONAR CONTROL MODULE CIRCUIT	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C02 RRC SONAR CONTROL MODULE CIRCUIT.
B2C03	RL SONAR CONTROL MODULE CIRCUIT	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C03 RL SONAR CONTROL MODULE CIRCUIT.
B2C04	RLC SONAR CONTROL MODULE CIRCUIT	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C04 RLC SONAR CONTROL MODULE CIRCUIT.
B2C05	SONAR CONTROL MODULE POWER	 Ref. to REVERSE AUTOMATIC BRAKING

	SUPPLY	(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C05 SONAR CONTROL MODULE POWER SUPPLY.
B2C06	RR SONAR SENSOR CIRCUIT / NO SIGNAL	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C06 RR SONAR SENSOR CIRCUIT / NO SIGNAL.
B2C07	RR SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C07 RR SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT.
B2C08	RRC SONAR SENSOR CIRCUIT / NO SIGNAL	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C08 RRC SONAR SENSOR CIRCUIT / NO SIGNAL.
B2C09	RRC SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C09 RRC SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT.
B2C0A	RL SONAR SENSOR CIRCUIT / NO SIGNAL	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C0A RL SONAR SENSOR CIRCUIT / NO SIGNAL.
B2C0B	RL SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C0B RL SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT.
B2C0C	RLC SONAR SENSOR CIRCUIT / NO SIGNAL	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C0C RLC SONAR SENSOR CIRCUIT / NO SIGNAL.
B2C0D	RLC SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C0D RLC SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT.
B2C0E	RR SONAR HARNESS HIGH	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C0E RR SONAR HARNESS HIGH.
B2C0F	RR SONAR HARNESS LOW	 Ref. to REVERSE AUTOMATIC BRAKING

		(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C0F RR SONAR HARNESS LOW.
B2C10	RRC SONAR HARNESS HIGH	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C10 RRC SONAR HARNESS HIGH.
B2C11	RRC SONAR HARNESS LOW	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C11 RRC SONAR HARNESS LOW.
B2C12	RL SONAR HARNESS HIGH	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C12 RL SONAR HARNESS HIGH.
B2C13	RL SONAR HARNESS LOW	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C13 RL SONAR HARNESS LOW.
B2C14	RLC SONAR HARNESS HIGH	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C14 RLC SONAR HARNESS HIGH.
B2C15	RLC SONAR HARNESS LOW	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C15 RLC SONAR HARNESS LOW.
B2C16	RRC SONAR HARNESS HIGH / RRC SONAR CONTROL MODULE CIRCUIT	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C16 RRC SONAR HARNESS HIGH / RRC SONAR CONTROL MODULE CIRCUIT.
B2C17	RLC SONAR HARNESS HIGH / RLC SONAR CONTROL MODULE CIRCUIT	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C17 RLC SONAR HARNESS HIGH / RLC SONAR CONTROL MODULE CIRCUIT.
B2C18	RR SONAR HARNESS HIGH / RR SONAR CONTROL MODULE CIRCUIT	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C18 RR SONAR HARNESS HIGH / RR SONAR CONTROL MODULE CIRCUIT.
B2C19	RL SONAR HARNESS HIGH / RL SONAR CONTROL MODULE CIRCUIT	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with


		Diagnostic Trouble Code (DTC)>DTC B2C19 RL SONAR HARNESS HIGH / RL SONAR CONTROL MODULE CIRCUIT.
B2C1A	RRC SONAR SENSOR	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C1A RRC SONAR SENSOR.
B2C1B	RLC SONAR SENSOR	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C1B RLC SONAR SENSOR.
B2C1C	RR SONAR SENSOR	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C1C RR SONAR SENSOR.
B2C1D	RL SONAR SENSOR	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C1D RL SONAR SENSOR.
B2C1E	RRC SONAR HARNESS LOW / RRC SONAR CONTROL MODULE CIRCUIT	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C1E RRC SONAR HARNESS LOW / RRC SONAR CONTROL MODULE CIRCUIT.
B2C1F	RLC SONAR HARNESS LOW / RLC SONAR CONTROL MODULE CIRCUIT	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C1F RLC SONAR HARNESS LOW / RLC SONAR CONTROL MODULE CIRCUIT.
B2C20	RR SONAR HARNESS LOW / RR SONAR CONTROL MODULE CIRCUIT	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C20 RR SONAR HARNESS LOW / RR SONAR CONTROL MODULE CIRCUIT.
B2C21	RL SONAR HARNESS LOW / RL SONAR CONTROL MODULE CIRCUIT	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C21 RL SONAR HARNESS LOW / RL SONAR CONTROL MODULE CIRCUIT.
B2C22	EyeSight SYSTEM	 Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C22 Eyesight System.

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

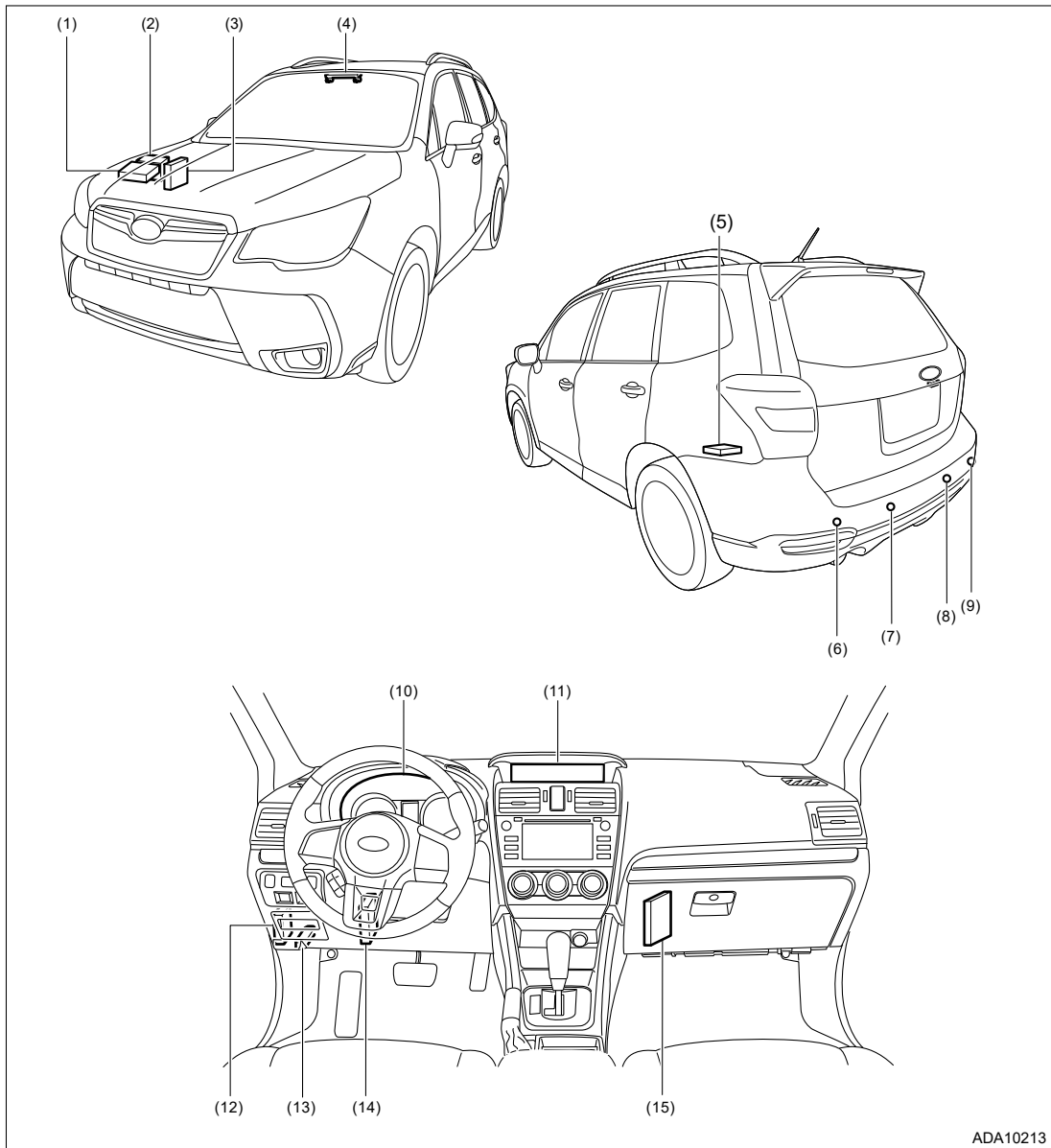
1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Reverse Automatic Braking], and then select [Enter].
5. On [Select Function] display, select [DTC].

Note:

- For detailed operation procedures, refer to “Application help”.
 - For details concerning DTC, refer to “List of Diagnostic Trouble Code (DTC)”.
-  [Ref. to REVERSE AUTOMATIC BRAKING \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\)>LIST.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Electrical Component Location

LOCATION




ADA10213

- | | | |
|--------------------------------|---------------------------------|---------------------------------|
| (1) Engine CM (engine type FA) | (6) Sonar sensor (left corner) | (11) MFD |
| (2) VDC CM | (7) Sonar sensor (left inner) | (12) Body integrated unit |
| (3) Power steering CM | (8) Sonar sensor (right inner) | (13) Data link connector |
| (4) Stereo camera | (9) Sonar sensor (right corner) | (14) Transmission CM |
| (5) RAB CM | (10) Combination meter | (15) Engine CM (engine type FB) |

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Freeze Frame Data

LIST

Items to be displayed	Content	Standard	Note (unit)
Trip Count	Time stamp information.  Ref. to LAN SYSTEM (DIAGNOSTICS)>General Description>CAUTION > TIME STAMP.	-	Time
Count		-	-
Time Count		-	ms
Battery Voltage	System information.	0 – 24.5	V
Voltage of IGN	System information.	0 – 17.85	V
Sonar	System information.	0 – 24.5	V
RAB Operation Times	System information.	0 – 255	Times (in one IGN_ON)
RAB Cancel Times	System information.	0 – 255	Times (in one IGN_ON)
Stop Hold Cancel Times	System information.	0 – 255	Times (in one IGN_ON)
FAIL times	System information.	0 – 255	Times (in one IGN_ON)
HALT times	System information.	0 – 255	Times (in one IGN_ON)
RR Sonar Sensitivity	System information.	-128 – 127	-
RRC Sonar Sensitivity	System information.	-128 – 127	-
RL Sonar Sensitivity	System information.	-128 – 127	-
RLC Sonar Sensitivity	System information.	-128 – 127	-
RAB Detection Distance(Coordinate:X)	Sonar sensor detection information.	0 – 510	cm
RAB Detection Distance(Coordinate:Y)	Sonar sensor detection information.	-255 – 254	cm
RR Sonar Detection Distance	Sonar sensor detection information.	0 – 510	cm
RRC Sonar Detection Distance	Sonar sensor detection information.	0 – 510	cm
RL Sonar Detection Distance	Sonar sensor detection information.	0 – 510	cm
RLC Sonar Detection Distance	Sonar sensor detection information.	0 – 510	cm
Drive Wheel Average Speed	Vehicle information.	0 – 3686.4	km/h
Wheel Speed for Fail Safe	Vehicle information.	0 – 3686.4	km/h
Driver Brake Detection	Vehicle information.	•ON •OFF	-
Vehicle Height Sensor	Vehicle information.	0 – 5.1	V

Voltage			
Ambient Air Temperature	Vehicle information.	-40 — 87	°C
Shift Position	Vehicle information.	-	-
EPB Equipment Information	Operation instruction from EyeSight.	<ul style="list-style-type: none"> •Vehicle without EPB •Vehicle with EPB 	-
EyeSight Initialization(RAB)	Operation instruction from EyeSight.	<ul style="list-style-type: none"> •EyeSight initialization in progress •Initialization completed 	-
Recession Control Permission(RAB)	Operation instruction from EyeSight.	<ul style="list-style-type: none"> •Reverse control not permitted •Reverse control permitted 	-
RAB Fail Indication(EyeSight→RAB)	Operation instruction from EyeSight.	<ul style="list-style-type: none"> •No failure •Failure 	-
RAB OFF Indication(EyeSight→RAB)	Operation instruction from EyeSight.	<ul style="list-style-type: none"> •RAB ON •RAB forced OFF 	-
RAB Acceleration Suppression Control State(EyeSight→RAB)	Operation instruction from EyeSight.	<ul style="list-style-type: none"> •No control •Acceleration prevented •Progressively increasing 	-
RAB Brake Control State(EyeSight→RAB)	Operation instruction from EyeSight.	<ul style="list-style-type: none"> •No control •Pre-compression controlled •Brake controlled •Stop holding •Progressively decreasing 	-
RAB Precompression Control	Braking control instruction from RAB CM.	<ul style="list-style-type: none"> •Not performed •Pre-compression conducted 	-
RAB Acceleration Suppression Value	Braking control instruction from RAB CM.	0 — 2.55	G
RAB Acceleration Suppression Control	Braking control instruction from RAB CM.	<ul style="list-style-type: none"> •Not performed •Acceleration prevention conducted 	-
Deceleration Braking Instruction	Braking control instruction from RAB CM.	0 — 2.55	G
Recession Pre-Collision	Braking control	<ul style="list-style-type: none"> •Not performed 	-

Brake Control	instruction from RAB CM.	•Performed	
RAB Function OFF Information	HMI control instruction from RAB CM	•ON •OFF	-
Audible Alarm function OFF Information(RAB)	HMI control instruction from RAB CM	•ON •OFF	-
Sonar System HALT(RAB)	HMI control instruction from RAB CM	•Normal •Foreign objects on sonar •Abnormality detected	-
RAB Sonar System Failure(EyeSight→RAB)	HMI control instruction from RAB CM	•Normal •Sonar failure •System failure	-
RAB Function pause Do Not Disturb	HMI control instruction from RAB CM	•Operation permitted •Operation not permitted	-
RAB Alarm pause Do Not Disturb	HMI control instruction from RAB CM	•Operation permitted •Operation not permitted	-
Rear Sonar Distance Alarm Information (Rear_Center)	HMI control instruction from RAB CM	•No obstacle •Far •Middle •Short •Closest	-
Rear Sonar Distance Alarm Information (Rear Right Corner)	HMI control instruction from RAB CM	•No obstacle •Far •Middle •Short	-
Rear Sonar Distance Alarm Information (Rear Left Corner)	HMI control instruction from RAB CM	•No obstacle •Far •Middle •Short	-
RAB Alarm Level	HMI control instruction from RAB CM	•OFF •Level 1 •Level 2 •Level 3 •Level 4 •Level 5	-
RAB Alarm Interrupt Display Instruction	HMI control instruction from RAB CM	•No display •Caution for backward •Encourage braking	-
RAB Function Pause Information(MFD/AVN)	HMI settings instruction from MFD/navigation	•ON •OFF	-
RAB Alarm Pause	HMI settings instruction	•ON	-

Information(MFD/AVN)	from MFD/navigation	•OFF	
RAB Function Pause Information Change Request(MFD/AVN)	HMI settings instruction from MFD/navigation	•Yes •No	-
RAB Function ON/OFF Information(MET)	HMI settings instruction from the combination meter	•ON •OFF	-
RAB Alarm ON/OFF Information(MET)	HMI settings instruction from the combination meter	•ON •OFF	-
RAB Function ON/OFF Information Change Request(MET)	HMI settings instruction from the combination meter	•Yes •No	-
DTC sub code 1_FS_A001 decision flag	Information for failure analysis	•0 •1	-
FS_A002 decision flag	Information for failure analysis	•0 •1	-
FS_A003 decision flag	Information for failure analysis	•0 •1	-
FS_A004 decision flag	Information for failure analysis	•0 •1	-
FS_A005 decision flag	Information for failure analysis	•0 •1	-
FS_A006 decision flag	Information for failure analysis	•0 •1	-
FS_A007 decision flag	Information for failure analysis	•0 •1	-
FS_A008 decision flag	Information for failure analysis	•0 •1	-
FS_A009 decision flag	Information for failure analysis	•0 •1	-
FS_A010 decision flag	Information for failure analysis	•0 •1	-
FS_A011 decision flag	Information for failure analysis	•0 •1	-
FS_A012 decision flag	Information for failure analysis	•0 •1	-
FS_A013 decision flag	Information for failure analysis	•0 •1	-
FS_A014 decision flag	Information for failure analysis	•0 •1	-
FS_A015 decision flag	Information for failure	•0	-

	analysis	•1	
FS_A016 decision flag	Information for failure analysis	•0 •1	-
FS_A017 decision flag	Information for failure analysis	•0 •1	-
FS_A018 decision flag	Information for failure analysis	•0 •1	-
FS_A019 decision flag	Information for failure analysis	•0 •1	-
RRC <A-01> Count	Information for failure analysis	-	-
RRC <A-02> Count	Information for failure analysis	-	-
RRC <A-03> Count	Information for failure analysis	-	-
RRC <A-04> Count	Information for failure analysis	-	-
RRC <A-05> Count	Information for failure analysis	-	-
RRC <B-01> Count	Information for failure analysis	-	-
RRC <B-02> Count	Information for failure analysis	-	-
RRC <B-03> Count	Information for failure analysis	-	-
RRC <B-04> Count	Information for failure analysis	-	-
RRC <B-05> Count	Information for failure analysis	-	-
RRC <C-01> Count	Information for failure analysis	-	-
RRC <C-02> Count	Information for failure analysis	-	-
RRC <C-03> Count	Information for failure analysis	-	-
RRC <C-04> Count	Information for failure analysis	-	-
RRC <C-05> Count	Information for failure analysis	-	-
RRC <D-02> Count	Information for failure analysis	-	-
RRC <D-05> Count	Information for failure analysis	-	-

RLC <A-01> Count	Information for failure analysis	-	-
RLC <A-02> Count	Information for failure analysis	-	-
RLC <A-03> Count	Information for failure analysis	-	-
RLC <A-04> Count	Information for failure analysis	-	-
RLC <A-05> Count	Information for failure analysis	-	-
RLC <B-01> Count	Information for failure analysis	-	-
RLC <B-02> Count	Information for failure analysis	-	-
RLC <B-03> Count	Information for failure analysis	-	-
RLC <B-04> Count	Information for failure analysis	-	-
RLC <B-05> Count	Information for failure analysis	-	-
RLC <C-01> Count	Information for failure analysis	-	-
RLC <C-02> Count	Information for failure analysis	-	-
RLC <C-03> Count	Information for failure analysis	-	-
RLC <C-04> Count	Information for failure analysis	-	-
RLC <C-05> Count	Information for failure analysis	-	-
RLC <D-02> Count	Information for failure analysis	-	-
RLC <D-05> Count	Information for failure analysis	-	-
RR <A-01> Count	Information for failure analysis	-	-
RR <A-02> Count	Information for failure analysis	-	-
RR <A-03> Count	Information for failure analysis	-	-
RR <A-04> Count	Information for failure analysis	-	-
RR <A-05> Count	Information for failure	-	-

	analysis		
RR <B-01> Count	Information for failure analysis	-	-
RR <B-02> Count	Information for failure analysis	-	-
RR <B-03> Count	Information for failure analysis	-	-
RR <B-04> Count	Information for failure analysis	-	-
RR <B-05> Count	Information for failure analysis	-	-
RR <C-01> Count	Information for failure analysis	-	-
RR <C-02> Count	Information for failure analysis	-	-
RR <C-03> Count	Information for failure analysis	-	-
RR <C-04> Count	Information for failure analysis	-	-
RR <C-05> Count	Information for failure analysis	-	-
RR <D-02> Count	Information for failure analysis	-	-
RR <D-05> Count	Information for failure analysis	-	-
RL <A-01> Count	Information for failure analysis	-	-
RL <A-02> Count	Information for failure analysis	-	-
RL <A-03> Count	Information for failure analysis	-	-
RL <A-04> Count	Information for failure analysis	-	-
RL <A-05> Count	Information for failure analysis	-	-
RL <B-01> Count	Information for failure analysis	-	-
RL <B-02> Count	Information for failure analysis	-	-
RL <B-03> Count	Information for failure analysis	-	-
RL <B-04> Count	Information for failure analysis	-	-

RL <B-05> Count	Information for failure analysis	-	-
RL <C-01> Count	Information for failure analysis	-	-
RL <C-02> Count	Information for failure analysis	-	-
RL <C-03> Count	Information for failure analysis	-	-
RL <C-04> Count	Information for failure analysis	-	-
RL <C-05> Count	Information for failure analysis	-	-
RL <D-02> Count	Information for failure analysis	-	-
RL <D-05> Count	Information for failure analysis	-	-

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Freeze Frame Data

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Reverse Automatic Braking], and then select [Enter].
5. On [Select Function] display, select [DTC].
6. On [DTC] display, select [FFD].

Note:

- **For detailed operation procedures, refer to “Application help”.**
- **The system conditions when malfunction occurred (when DTC code was confirmed) can be stored up to 10 conditions.**

CAUTION

1. AIRBAG SYSTEM

Airbag system wiring harness is routed near the control module.

Caution:



- **Do not use the electrical test equipment on the airbag system wiring harnesses and connector circuits.**
- **Be careful not to damage the airbag system wiring harness.**

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > General Description

INSPECTION

Before performing diagnostics, check the following item which might affect the Reverse Automatic Braking system problems.


1. BASIC INSPECTION

1. Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DQ\)>Battery.](#)
2. Check the main and other fuses, harnesses and connectors. Also check for proper grounding.
 [Ref. to REVERSE AUTOMATIC BRAKING>Relay and Fuse.](#)

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	— (Newly adopted tool)	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".

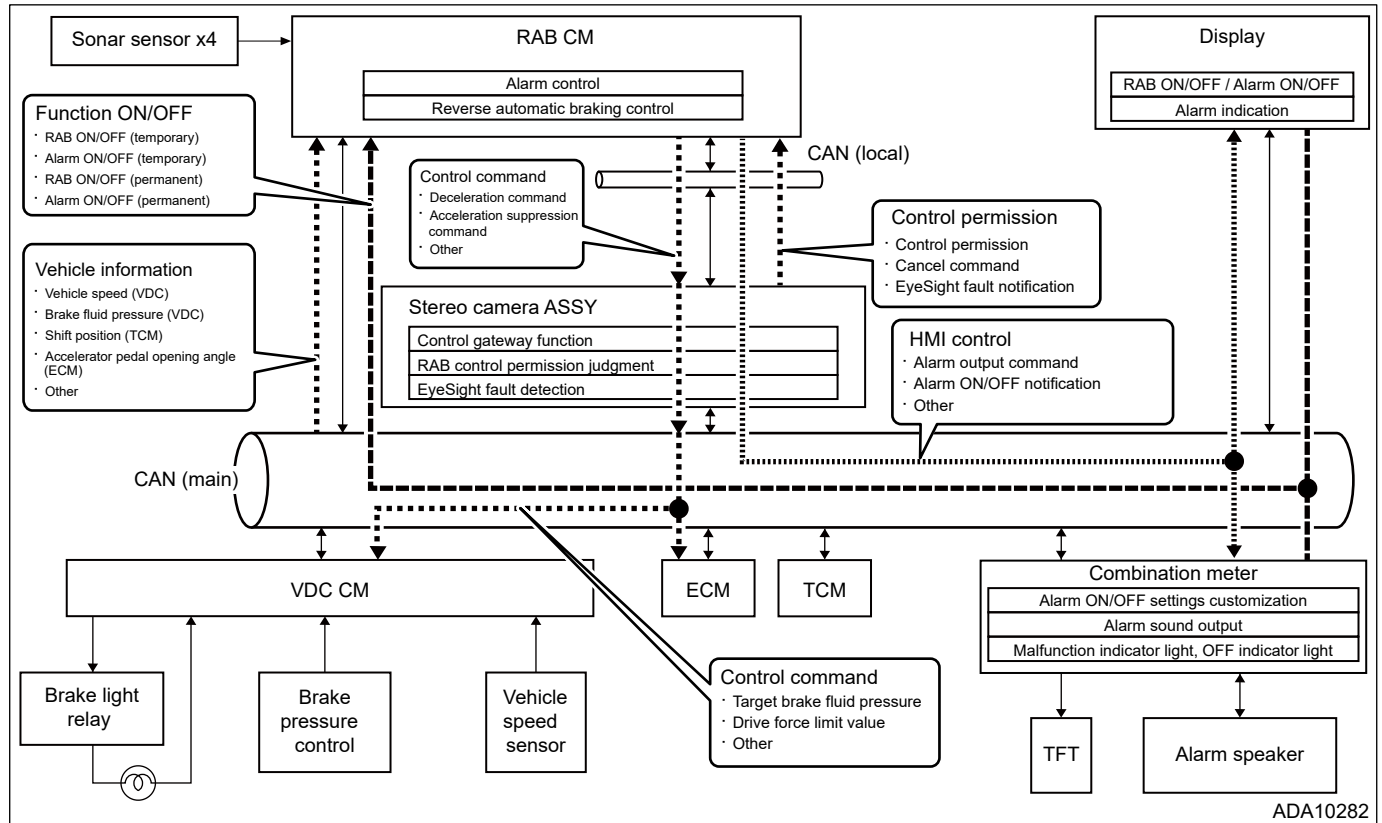
2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > General Description

SYSTEM BLOCK DIAGRAM

The Reverse Automatic Braking system is a system to avoid collision or reduce collision damage by informing with sound and operating the brake automatically, when the vehicle may collide with walls or obstacles on the rear during reversing.



REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Inspection Mode

PROCEDURE

It is possible to diagnose the DTC by performing the indicated inspection mode.

After correcting the DTC, perform a necessary inspection mode and make sure that the function is resumed correctly and the DTC is recorded.

- 1.** Turn the ignition switch to ON, and wait for 6 seconds or more. (*1)
- 2.** Confirm that the RAB warning light (RAB malfunction indicator light) of MID in the combination meter is off.
- 3.** Read the DTC and check that the DTC is not displayed. (*2)

*1: Even with normal condition, "RAB warning light (RAB OFF indicator light)" illuminates for 6 seconds after turning the ignition switch to ON, and then goes off after 6 seconds.

*2: Perform all DTC diagnosis within 3 seconds after the ignition switch is turned to ON. It is not necessary to shift the gear in the R range to operate the function.

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Warning Light Illumination Pattern

INSPECTION

- When the Reverse Automatic Braking is error
"RAB" illuminates in MID in the combination meter.
- When the Reverse Automatic Braking is stopped temporarily
"RAB OFF" illuminates in MID in the combination meter.

Note:

- **Even with normal condition, "RAB warning light (RAB OFF indicator light)" illuminates for 6 seconds after turning the ignition switch to ON, and then goes off after 6 seconds.**

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Work Support

LIST

Work support item	Content
RAB operation record data storing	When ignition switch ON counts of "Latest", "1 block before", "2 blocks before" ... "4 blocks before" all shows "0", it can be judged that there is no data. The display shows the latest data and the data in the previous 4 times in the order of their occurrence. Blue letter means that the data exists, and black letter means that there is no data. Select the blue letters and read out the details.
ECM initialization	RAB CM is reset to the factory settings.
ECM part number display	RAB CM part number is displayed.
Software information display	Software information is displayed.

Sensitivity of each sonar sensor can NOT be adjusted.

REVERSE AUTOMATIC BRAKING (DIAGNOSTICS) > Work Support

OPERATION

- 1.** On [Start] display, select [Diagnosis].
- 2.** On [Vehicle selection] display, input the target vehicle information and select [OK].
- 3.** On [Main Menu] display, select [Each System].
- 4.** On [Select System] display, select Reverse Automatic Braking, and then select [Enter].
- 5.** On [Select Function] display, select [Work Support], and select [Next].

Note:

For detailed operation procedures, refer to “Application help”.

TELEMATICS SYSTEM (DIAGNOSTICS) > Active Test

LIST

Item	Note
GREEN LED Lighting	GREEN LED illuminates/flashes/goes off.
GREEN LED Flashing	
GREEN LED OFF	
RED LED Lighting	RED LED illuminates/flashes/goes off.
RED LED Flashing	
RED LED OFF	
Speaker ON	Outputs to speaker.

TELEMATICS SYSTEM (DIAGNOSTICS) > Active Test

OPERATION


- 1.** On [Start] display, select [Diagnosis].
- 2.** On [Vehicle selection] display, input the target vehicle information and select [OK].
- 3.** On [Main Menu] display, select [Each System].
- 4.** On [Select System] display, select [Telematics], and then select [Enter].
- 5.** On [Select Function] display, select Active Test.

Note:

For detailed operation procedures, refer to “Application help”.

PROCEDURE

1. PERFORM CUSTOMER INTERVIEW.

Using the Check List for Interview, ask the customer the condition of how the trouble occurred.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Check List for](#)

[Interview>CHECK](#)

TELEMATICS SYSTEM (DIAGNOSTICS) > Check List for Interview

CHECK

1. CHECK LIST FOR INTERVIEW


- Inspect the following items regarding the vehicle’s state.
- Print out this page for interviewing customers.




Telematics Check List for Interview		Received Year Month Date	
Customer’s name	Registration No.		Initial year of registration Year Month Date
	Vehicle model		Frame number
Interviewer ()	Inspector ()	Engine type ()	Odometer reading ()
Customer specified content			
•			
•			

Did you interview the customer?

Yes

 [Go to 2.](#)


No

Interview the customer.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Check List for Interview>CHECK.](#)

2. CHECK SUBARU SELECT MONITOR COMMUNICATION.

Using the Subaru Select Monitor, check whether communication to the telematics system can be executed.

Note:

If the communication function of the Subaru Select Monitor cannot be executed properly, check the communication circuit.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Subaru Select Monitor>INSPECTION.](#)

Is communication possible?


Yes

 [Go to 3.](#)


No

Check the communication circuit.

3. CHECK TELEMATICS.


Using the Subaru Select Monitor, read DTC of the telematics system.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Note:

If only the RED LED illuminates, DTC is detected. For details, refer to “LED operation status list”.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Check List for Interview>CHECK > LED ILLUMINATION STATUS LIST.](#)

Are any DTCs displayed?


Yes

Perform the diagnosis for the displayed DTCs.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\)>LIST.](#)

No

 [Go to 4.](#)





4. CHECK DIAGNOSTICS WITH PHENOMENON.

Check the list of Diagnostics with Phenomenon.  [Ref. to TELEMATICS SYSTEM](#)

[\(DIAGNOSTICS\)>Diagnostics with Phenomenon>LIST](#) 

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostics with Phenomenon

LIST

No.	Symptoms	Reference
1	The system does not notify the Telematics Service Provider Center automatically after collision.	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE SYSTEM DOES NOT NOTIFY THE TELEMATIC SERVICE PROVIDER CENTER AUTOMATICALLY AFTER COLLISION.
2	The system does not notify the center even if the SOS button is pressed.	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE SYSTEM DOES NOT NOTIFY THE CENTER EVEN IF THE SOS BUTTON IS PRESSED.
3	The system places an SOS call unintentionally during driving.	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE SYSTEM PLACES AN SOS CALL UNINTENTIONALLY DURING DRIVING.
	The system places an I-CALL unintentionally	 Ref. to TELEMATICS SYSTEM

Does the symptom apply?




Yes

Perform diagnosis according to the procedures in the diagnostics with phenomenon.

No


 [Go to 5.](#)

5. CHECK TROUBLE PHENOMENON.

1. Perform the basic inspection and function check.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>General Description>INSPECTION.](#)
2. Check the data communication module.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Control Module I/O Signal.](#)
3. Check data monitor.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)
4. Perform a unit check.

Was the trouble cause found?

Yes

Clear the memory after repairing or replacing the cause of trouble.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)

No

System is normal.

TELEMATICS SYSTEM (DIAGNOSTICS) > Check List for Interview



CHECK

1. CHECK LIST FOR INTERVIEW



- Inspect the following items regarding the vehicle's state.
- Print out this page for interviewing customers.



Telematics Check List for Interview		Received Year Month Date	
Customer's name		Registration No.	Initial year of registration Year Month Date
		Vehicle model	Frame number
Interviewer ()	Inspector ()	Engine type ()	Odometer reading ()
Customer specified content • • •			
Date when problem occurred	Year Month Date	Frequency of trouble occurrence	Always occurs Sometimes occurs (times per day, times per month)
Conditions at event	Weather <input type="checkbox"/> Fine <input type="checkbox"/> Cloudy <input type="checkbox"/> Rainy <input type="checkbox"/> Snowy <input type="checkbox"/> Others ()		
	Temperature °C (°F)		
	How often <input type="checkbox"/> Always <input type="checkbox"/> Once before <input type="checkbox"/> Sometimes (times a day / times a week / times a month)		
	When and how		
Situations at event	In what situations did it occur? <input type="checkbox"/> Fast Driving <input type="checkbox"/> Rough Roads <input type="checkbox"/> Parked <input type="checkbox"/> Unknown <input type="checkbox"/> Other		
	In what operations did it occur? <input type="checkbox"/> ACC On <input type="checkbox"/> Press i-button or SOS button <input type="checkbox"/> Operating door lock function with mobile phone <input type="checkbox"/> Operating door unlock function with mobile phone <input type="checkbox"/> Operating horn & hazard function with mobile phone <input type="checkbox"/> Operating own vehicle positioning function <input type="checkbox"/> Unknown <input type="checkbox"/> Other		
Situations at restoration	What helped the status return to normal? <input type="checkbox"/> Recover on its own <input type="checkbox"/> ACC Off and On <input type="checkbox"/> Does not recover <input type="checkbox"/> Other		
Location at event	<input type="checkbox"/> Unknown <input type="checkbox"/> Any Place <input type="checkbox"/> Driving around open areas like in the country <input type="checkbox"/> Driving around hills or mountains <input type="checkbox"/> Driving around cities with large buildings <input type="checkbox"/> Driving around residential areas or no large buildings <input type="checkbox"/> Driving around areas with power lines <input type="checkbox"/> Driving around rough roads or railway tracks		
Error message	Error message displayed		
Mobile phone	Mobile phone carrier (Example: Docomo)		
	Mobile phone model (Example: Apple Iphone6)		
	Mobile phone OS version (software version information)		
Telematics subscription status	<input type="checkbox"/> Subscription (Year Month Date) <input type="checkbox"/> Non-contract		
LED illumination status	RED LED <input type="checkbox"/> OFF <input type="checkbox"/> ON <input type="checkbox"/> Blink		

 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Check List for Interview>CHECK > LED ILLUMINATION STATUS LIST.	GREEN LED <input type="checkbox"/> OFF <input type="checkbox"/> ON <input type="checkbox"/> Blink
Check result	Reproductivity <input type="checkbox"/> Reproduced <input type="checkbox"/> Always <input type="checkbox"/> Sometimes <input type="checkbox"/> Cannot be reproduced Condition <input type="checkbox"/> Cold <input type="checkbox"/> Warm <input type="checkbox"/> At starting <input type="checkbox"/> Immediately after starting <input type="checkbox"/> During warm-up <input type="checkbox"/> At idle <input type="checkbox"/> When start driving <input type="checkbox"/> While driving <input type="checkbox"/> At acceleration <input type="checkbox"/> At deceleration <input type="checkbox"/> When applying brake
MSISDN No. of SIM	* Confirm on data monitor.  Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.
DTC	

2. LED ILLUMINATION STATUS LIST

LED	Light ON	Blink	All OFF
RED only	DTC for DCM is detected. (Communication is possible depending on DTCs.)	An attempt to call or connect to the server is in progress. (However, the functions may be constrained because DTCs are detected.)	Telematics service cannot be used. (Excluding a free-of-charge period. No subscription)
GREEN only	Possible to communicate with the server. (No DTC for DCM)	An attempt to call or connect to the server is in progress.	
RED and GREEN	CommCheck is failed.  Ref. to ENTERTAINMENT>Telematics System>OPERATION > REGISTRATION (COMM CHECK). (It is possible that the server and communication system are malfunctioning.) * CommCheck cannot be initiated when the DCM side is malfunctioning (DTC is present).	CommCheck is in progress.  Ref. to ENTERTAINMENT>Telematics System>OPERATION > REGISTRATION (COMM CHECK).	

TELEMATICS SYSTEM (DIAGNOSTICS) > Clear memory

OPERATION

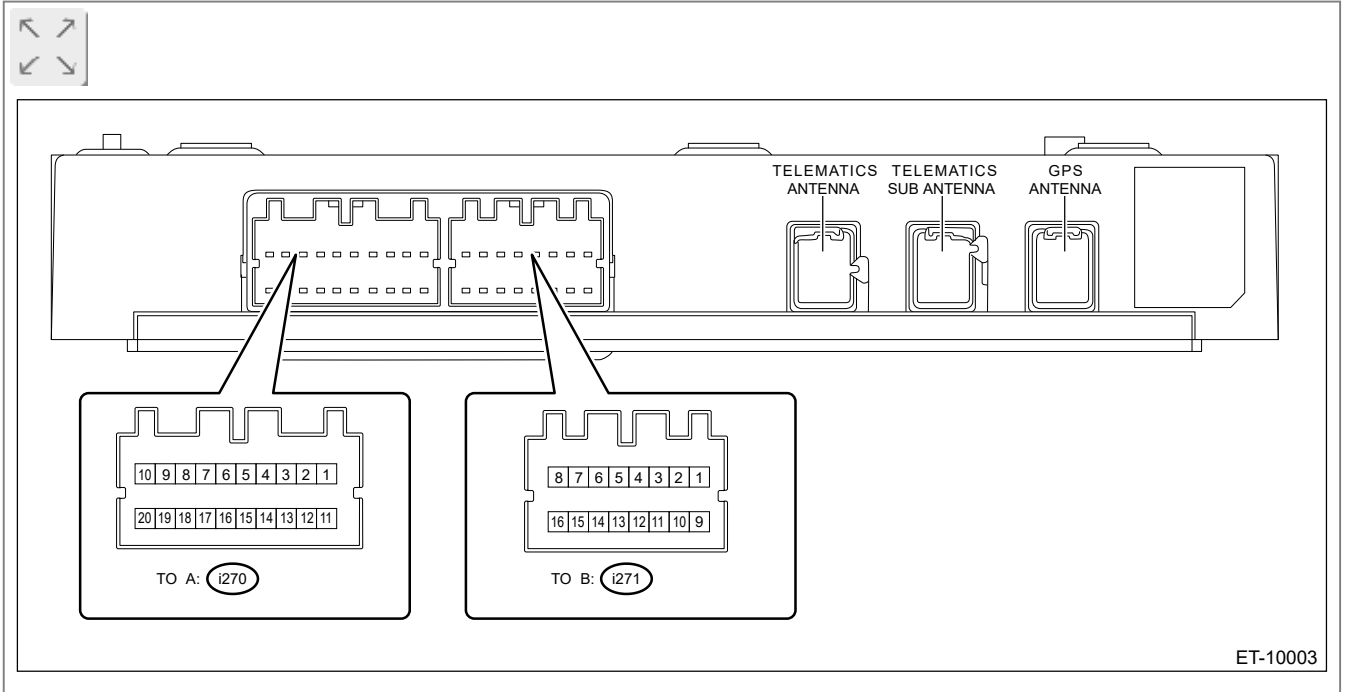
1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Telematics], and then select [Enter].
5. On [Select Function] display, select [DTC].
6. On [DTC] display, select [Clear Memory].

Note:

For detailed operation procedures, refer to “Application help”.

SPECIFICATION

1. DATA COMMUNICATION MODULE (DCM)



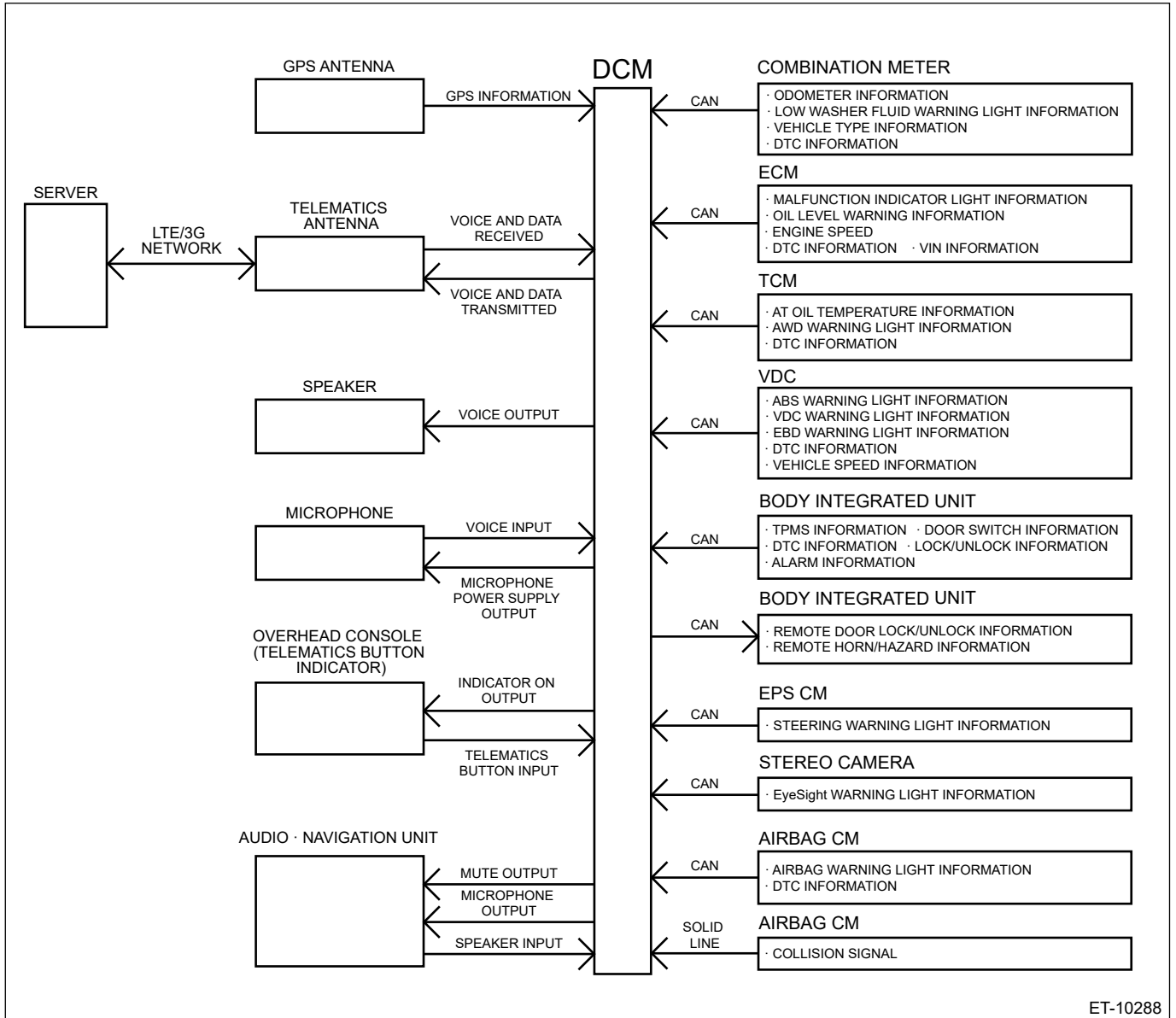
Terminal No.	Content	Measuring condition	Standard
A1	—	—	—
A2	—	—	—
A3	LED GREEN	—	—
A4 ↔ Chassis ground	i-button	i-button OFF → ON	1 MΩ or more → less than 1 Ω
A5 ↔ Chassis ground	SOS button	SOS button OFF → ON	1 MΩ or more → less than 1 Ω
A6	—	—	—
A7	CAN L	—	—
A8	Ignition power supply	Ignition switch OFF → ON	Less than 1 V → 9 — 16 V
A9	—	—	—
A10	Battery power supply	Always	9 — 16 V
A11	—	—	—
A12	—	—	—
A13	LED RED	—	—
A14 ↔ Chassis ground	GND	Always	Less than 1 Ω
A15	—	—	—

A16	—	—	—
A17	CAN H	—	—
A18	Collision detection signal	—	—
A19	MUTE	—	—
A20 ←→ Chassis ground	ACC	Ignition switch OFF → ACC ON	Less than 1 V → 9 — 16 V
B1	Front speaker input LH -	—	—
B2	Front speaker output LH -	—	—
B3	Front speaker input RH -	—	—
B4	Front speaker output RH -	—	—
B5	MIC signal OUT	—	—
B6	MIC signal	—	—
B7	MIC DET	—	—
B8	MIC 5 V	—	—
B9	Front speaker input LH +	—	—
B10	Front speaker output LH +	—	—
B11	Front speaker input RH +	—	—
B12	Front speaker output RH +	—	—
B13 ←→ Chassis ground	MIC GND OUT	Always	Less than 1 Ω
B14	MIC GND IN	—	—
B15	—	—	—
B16	—	—	—

TELEMATICS SYSTEM (DIAGNOSTICS) > Control Module I/O Signal


SYSTEM BLOCK DIAGRAM

Main signals used between DCM and relevant CM




TELEMATICS SYSTEM (DIAGNOSTICS) > Control Module I/O Signal

WIRING DIAGRAM

Refer to "TELEMATICS SYSTEM" in the wiring diagram.  [Ref. to WIRING SYSTEM>Telematics System>WIRING DIAGRAM.](#)

TELEMATICS SYSTEM (DIAGNOSTICS) > Data Monitor

LIST

Display	Content	Reference value	Unit
Trip Count [count]	Refer to "LAN SYSTEM (DIAGNOSTICS)".  Ref. to LAN SYSTEM (DIAGNOSTICS)>General Description>CAUTION > TIME STAMP.	-	-
Count		-	-
Time Count [msec]		-	-
Current GPS Data	Current GPS information	-	-
Signal Strength	Current signal strength	-	-
MSISDN	Phone number of DCM built-in SIM	-	-
GPS Data at ACN Event	GPS information at ACN event occurrence	-	-
TimeStamp at ACN Event	Time stamp information at ACN event occurrence	<p>Note: The time stamp is displayed in the Coordinated Universal Time (UTC), which is different from actual time at each location. Therefore, time difference needs to be corrected for use.</p>	-

		Example: [12/22 01:30 in UTC time] is corrected as [12/21 20:30 in New York time].	
Call Type at ACN Event	Information of ACN event occurrence	No Attempt ACN	-
RSSI at ACN Event	Signal strength at ACN event occurrence	-	%
Call Status at ACN Event	Result of call connection at ACN event occurrence	Call Not Started Service Not Provisioned No Network Service Call Ended by SXM Call Ended by Driver Call Ended by Exhausted Retry Call Started Call Connected	-
ACN Active	Subscription information on ACN function	FALSE TRUE	-
SOS Active	Subscription information on SOS function	FALSE TRUE	-
ICALL Active	Subscription information on I-CALL function	FALSE TRUE	-
Security alarm active	Subscription information on Security Alarm function	FALSE TRUE	-
Maintenance alert active	Subscription information on Maintenance Alert function	FALSE TRUE	-
MVR Active	Subscription information on MVR function	FALSE TRUE	-
Diagnostic	Subscription information on Diagnostic Alert	FALSE	-

c alert active	function	TRUE	
Account status	Basic subscription information	FALSE TRUE	-
Power source status	Operation power supply information (main battery or DCM built-in BUB)	DCM Currently Running On BUB DCM Currently Running On VBATT	-
Mode setting status	DCM mode information	Factory Mode Comm Check Unsubscribed Subscribed	-
Battery Voltage	Voltage information on main battery	-	V
Stored VIN	VIN information stored in DCM	-	-
GPS Data at Time of Button Push(1)	GPS information at SOS/I-CALL event occurrence (latest record)	-	-
Timestamp at Time of Button Push(1)	Time stamp information at SOS/I-CALL event occurrence (latest record)	Note: The time stamp is displayed in the Coordinated Universal Time (UTC), which is different from actual time at each location. Therefore, time difference needs to be corrected for use.	-

		Example: [12/22 01:30 in UTC time] is corrected as [12/21 20:30 in New York time].	
Call Type at SOS/ICALL Event(1)	Information of SOS/I-CALL event occurrence (latest record)	No Call SOS I-Call	-
RSSI at SOS/ICALL(1)	Signal strength at SOS/I-CALL event occurrence (latest record)	-	%
Call status at SOS/ICALL Event(1)	Result of call connection at SOS/I-CALL event occurrence (latest record)	Call Not Started Service Not Provisioned No Network Service Call Ended by SXM Call Ended by Driver Call Ended by Exhausted Retry Call Started Call Connected	-
GPS Data at Time of Button Push(2)	GPS information at SOS/I-CALL event occurrence (second last record)	-	-
Timestamp at Time of Button Push(2)	Time stamp information at SOS/I-CALL event occurrence (second last record)	Note: The time stamp is displayed in the Coordinated Universal Time (UTC),	-

		<p>which is different from actual time at each location. Therefore, time difference needs to be corrected for use. Example: [12/22 01:30 in UTC time] is corrected as [12/21 20:30 in New York time].</p>	
Call Type at SOS/ICALL Event(2)	Information of SOS/I-CALL event occurrence (second last record)	No Call SOS I-Call	-
RSSI at SOS/ICALL(2)	Signal strength at SOS/I-CALL event occurrence (second last record)	-	%
Call status at SOS/ICALL Event(2)	Result of call connection at SOS/I-CALL event occurrence (second last record)	Call Not Started Service Not Provisioned No Network Service Call Ended by SXM Call Ended by Driver Call Ended by Exhausted Retry Call Started Call Connected	-
GPS	GPS information at SOS/I-CALL event	-	-

Data at Time of Button Push(3)	occurrence (third last record)		
Timestamp at Time of Button Push(3)	Time stamp information at SOS/I-CALL event occurrence (third last record)	<p>Note:</p> <p>The time stamp is displayed in the Coordinated Universal Time (UTC), which is different from actual time at each location. Therefore, time difference needs to be corrected for use. Example: [12/22 01:30 in UTC time] is corrected as [12/21 20:30 in New York time].</p>	-
Call Type at SOS/ICALL Event(3)	Information of SOS/I-CALL event occurrence (third last record)	No Call SOS I-Call	-
RSSI at SOS/ICALL(3)	Signal strength at SOS/I-CALL event occurrence (third last record)	-	%
Call	Result of call connection at SOS/I-CALL	Call Not Started	-

status at SOS/ICALL Event(3)	event occurrence (third last record)	Service Not Provisioned No Network Service Call Ended by SXM Call Ended by Driver Call Ended by Exhausted Retry Call Started Call Connected	
Speaker gain level	Speaker specification information (standard or H/K)	Standard Radio/2 Speakers Premium Radio/4 Speakers	-
GREEN LED Voltage	GREEN LED voltage information	-	V
RED LED Voltage	RED LED voltage information	-	V
Left Speaker Status	Left speaker connection status	No Speaker Diagnostic Fault(Default) Output Short to PVDD Output Short to Ground Open Load Shorted Load Fault Condition Load Diagnostics Speaker Muted Speaker in Play Mode	-
Right speaker status	Right speaker connection status	No Speaker Diagnostic Fault(Default) Output Short to PVDD Output Short to Ground Open Load Shorted Load Fault Condition	-

		Load Diagnostics Speaker Muted Speaker in Play Mode	
--	--	--	--

TELEMATICS SYSTEM (DIAGNOSTICS) > Data Monitor

OPERATION

- 1.** On [Start] display, select Diagnosis.
- 2.** On [Select Vehicle] display, input the target vehicle information and select [OK].
- 3.** On [Main Menu] display, select [Each System].
- 4.** On [Select System] display, select [Telematics], and then select [Next].
- 5.** On [Select Function] display, select [Data Monitor].

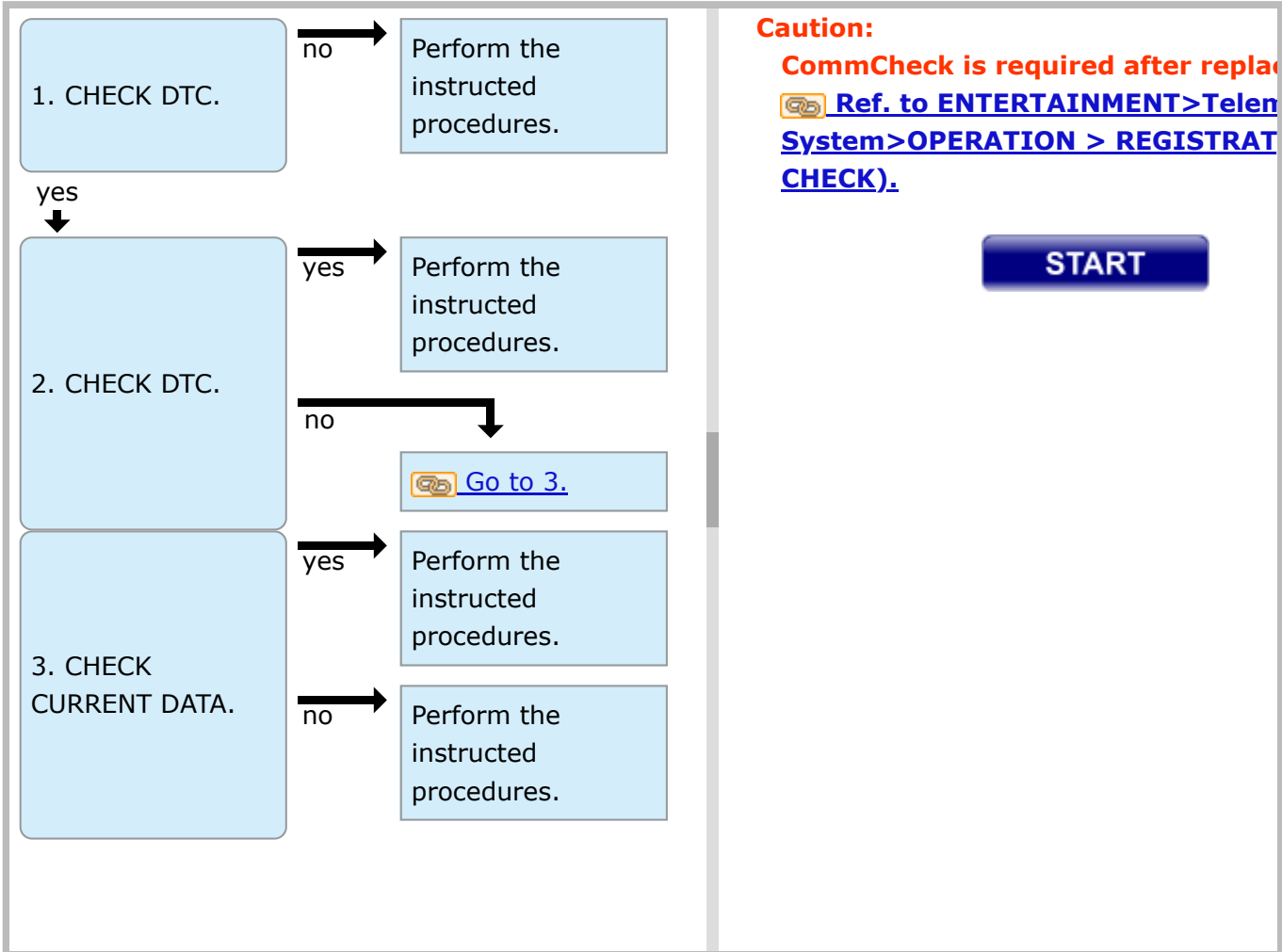
Note:

For detailed operation procedures, refer to “Application help”.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A00 VIN READING

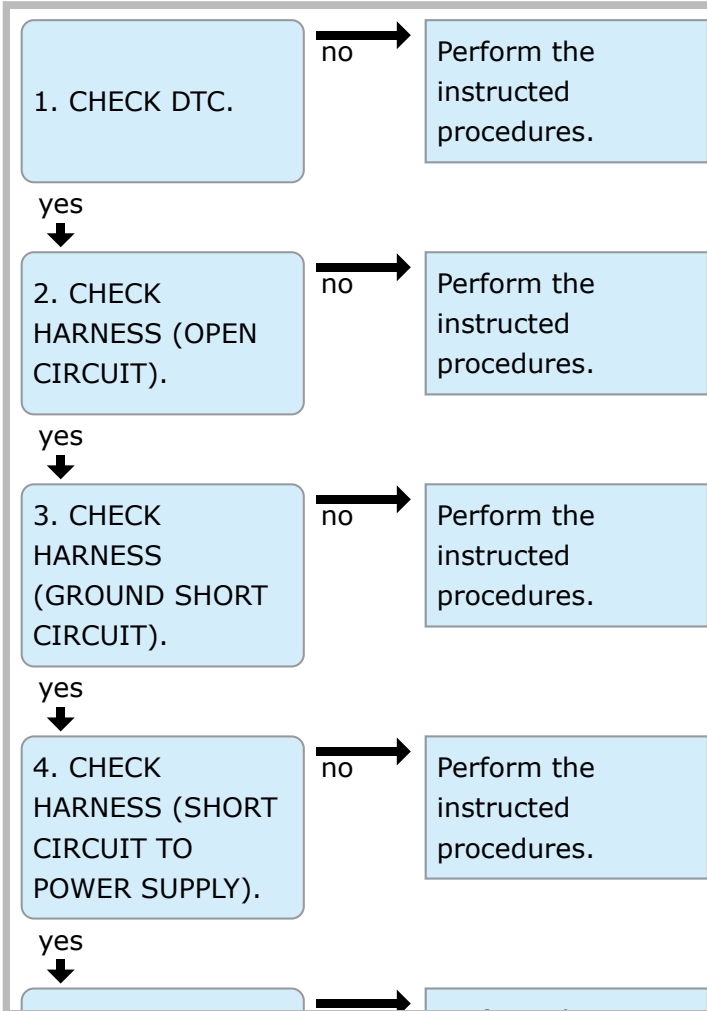
CAUTION/NOTE INTRO



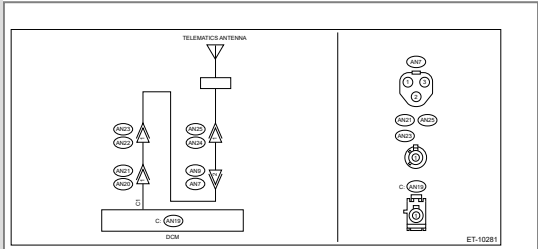
TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A01 LTE1 ANTENNA CIRCUIT

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Telematics [Ref. to WIRING SYSTEM>Tele System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

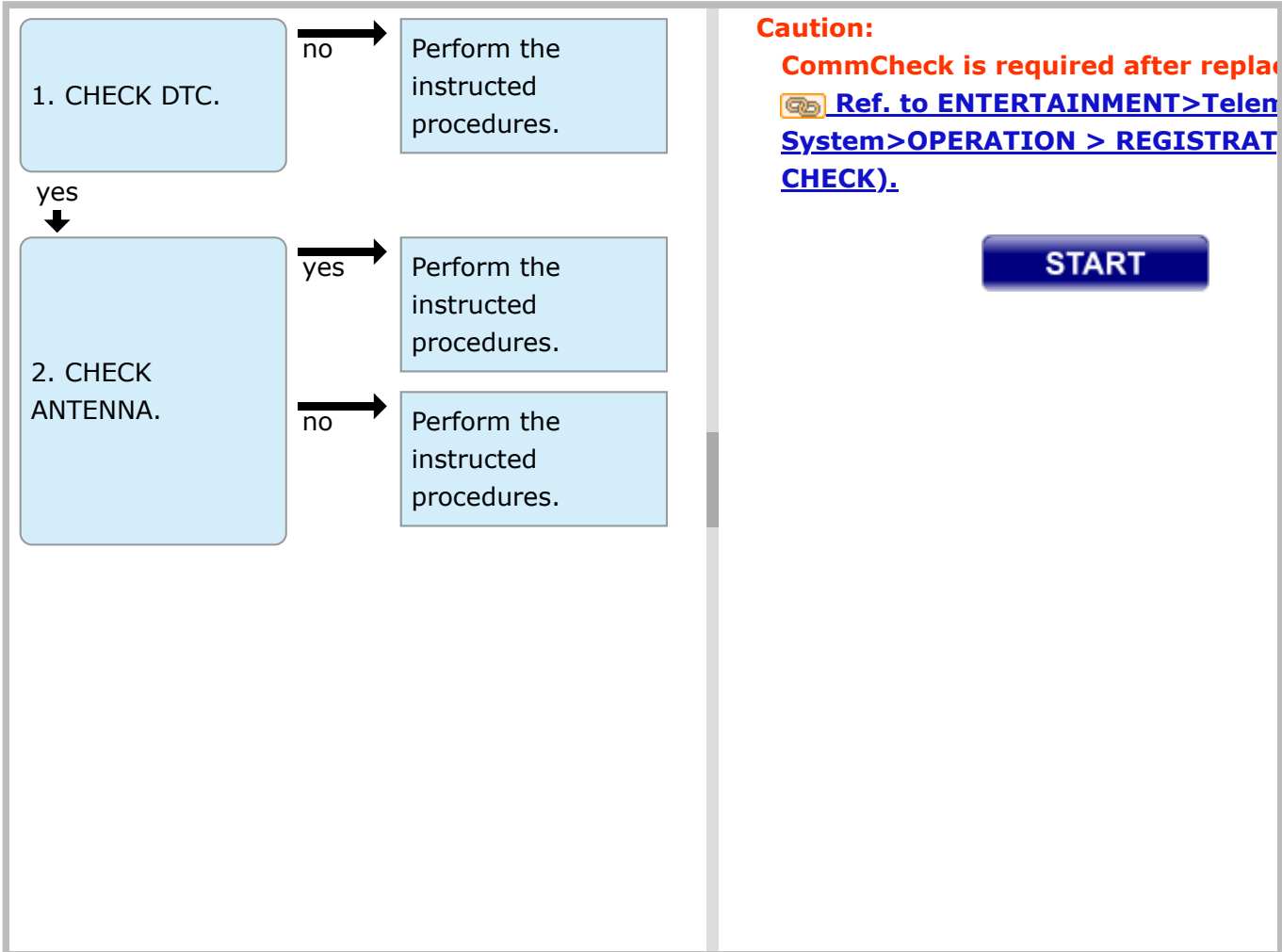
Caution:
CommCheck is required after replacement.
 [Ref. to ENTERTAINMENT>Tele System>OPERATION > REGISTRAT CHECK\).](#)

START

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A02 LTE2 ANTENNA CIRCUIT

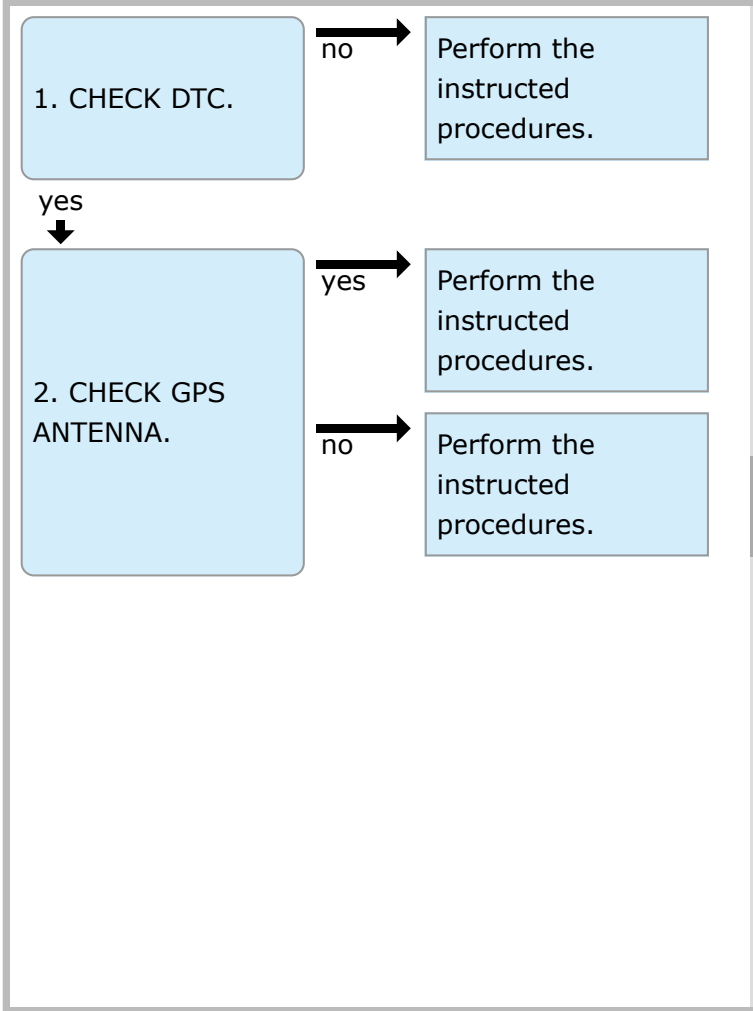
CAUTION/NOTE INTRO



TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A03 GPS ANTENNA CIRCUIT

CAUTION/NOTE INTRO



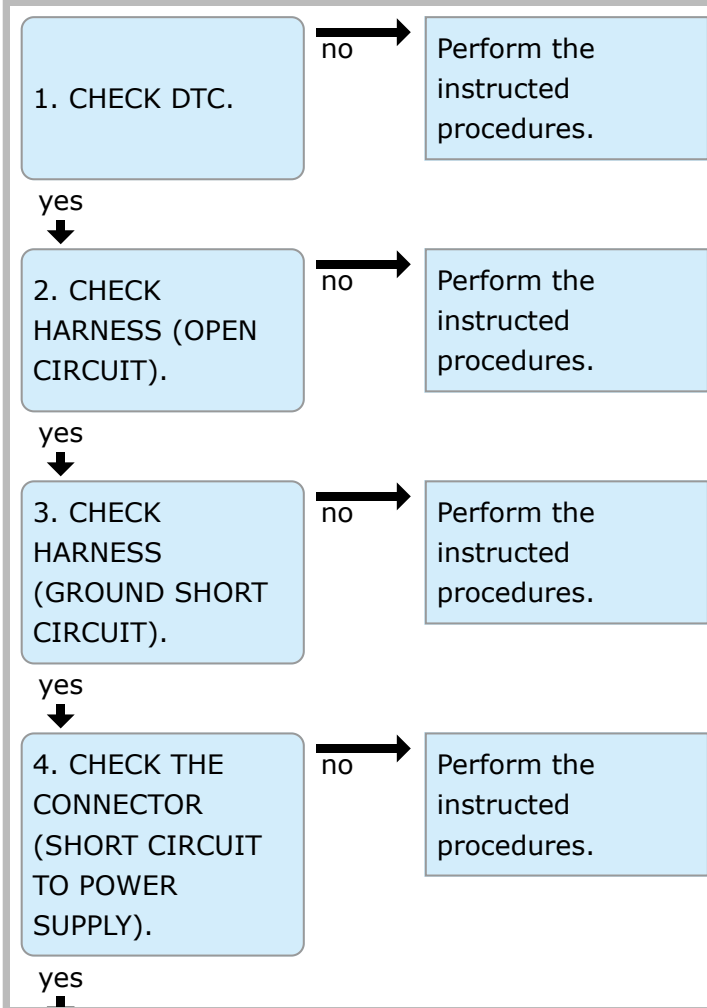
Caution:
CommCheck is required after replacement.
 [Ref. to ENTERTAINMENT>Telematics System>OPERATION > REGISTRATION CHECK\).](#)

START

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

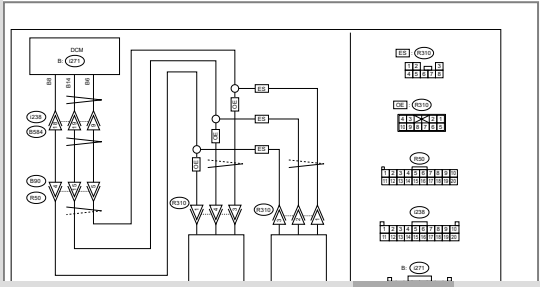
DTC B2A04 MIC CIRCUIT

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:

Telematics [Ref. to WIRING SYSTEM>Tele System>WIRING DIAGRAM.](#)



Caution:

CommCheck is required after replac

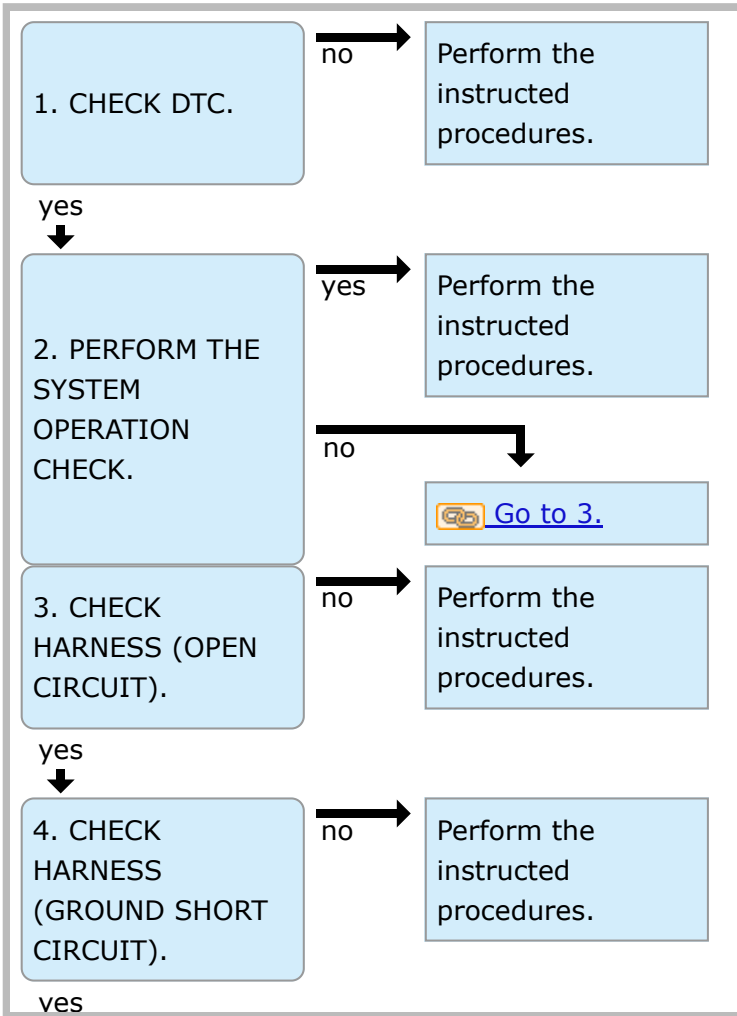
[Ref. to ENTERTAINMENT>Tele System>OPERATION > REGISTRAT CHECK\).](#)

START

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A05 LEFT SPEAKER/AUDIO CIRCUIT

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Telematics [Ref. to WIRING SYSTEM>Tele System>WIRING DIAGRAM.](#)

- Standard speaker model

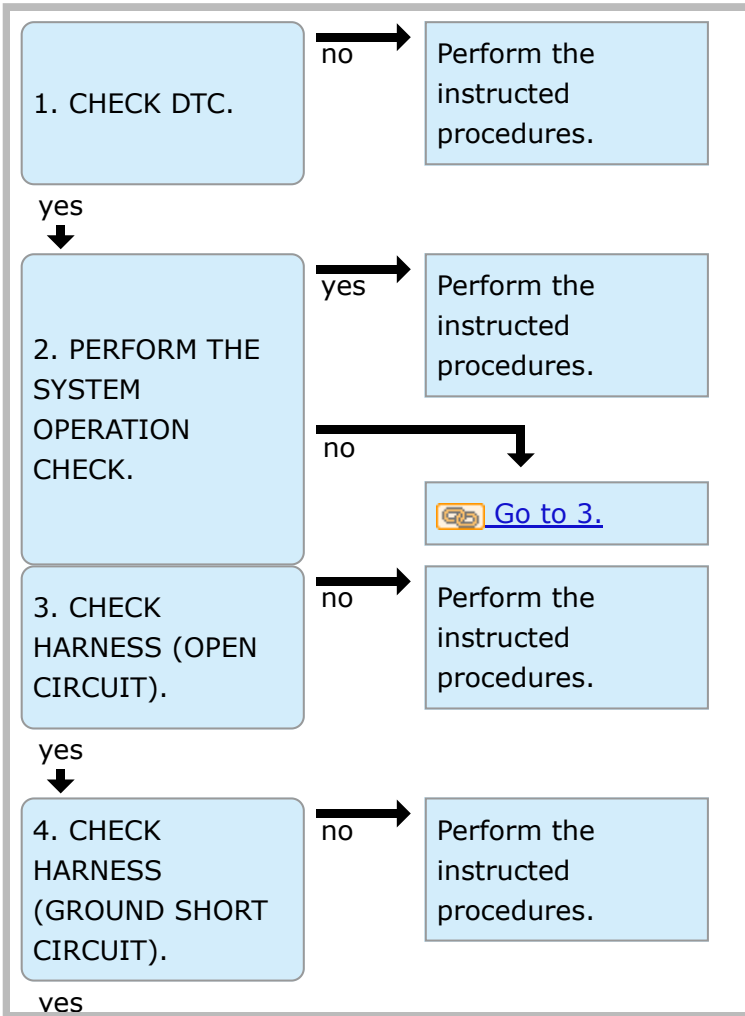
Caution:
CommCheck is required after replacement.
[Ref. to ENTERTAINMENT>Tele System>OPERATION > REGISTRAT CHECK\).](#)

START

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A06 RIGHT SPEAKER/AUDIO CIRCUIT

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Telematics [Ref. to WIRING SYSTEM>Tele System>WIRING DIAGRAM.](#)

- Standard speaker model

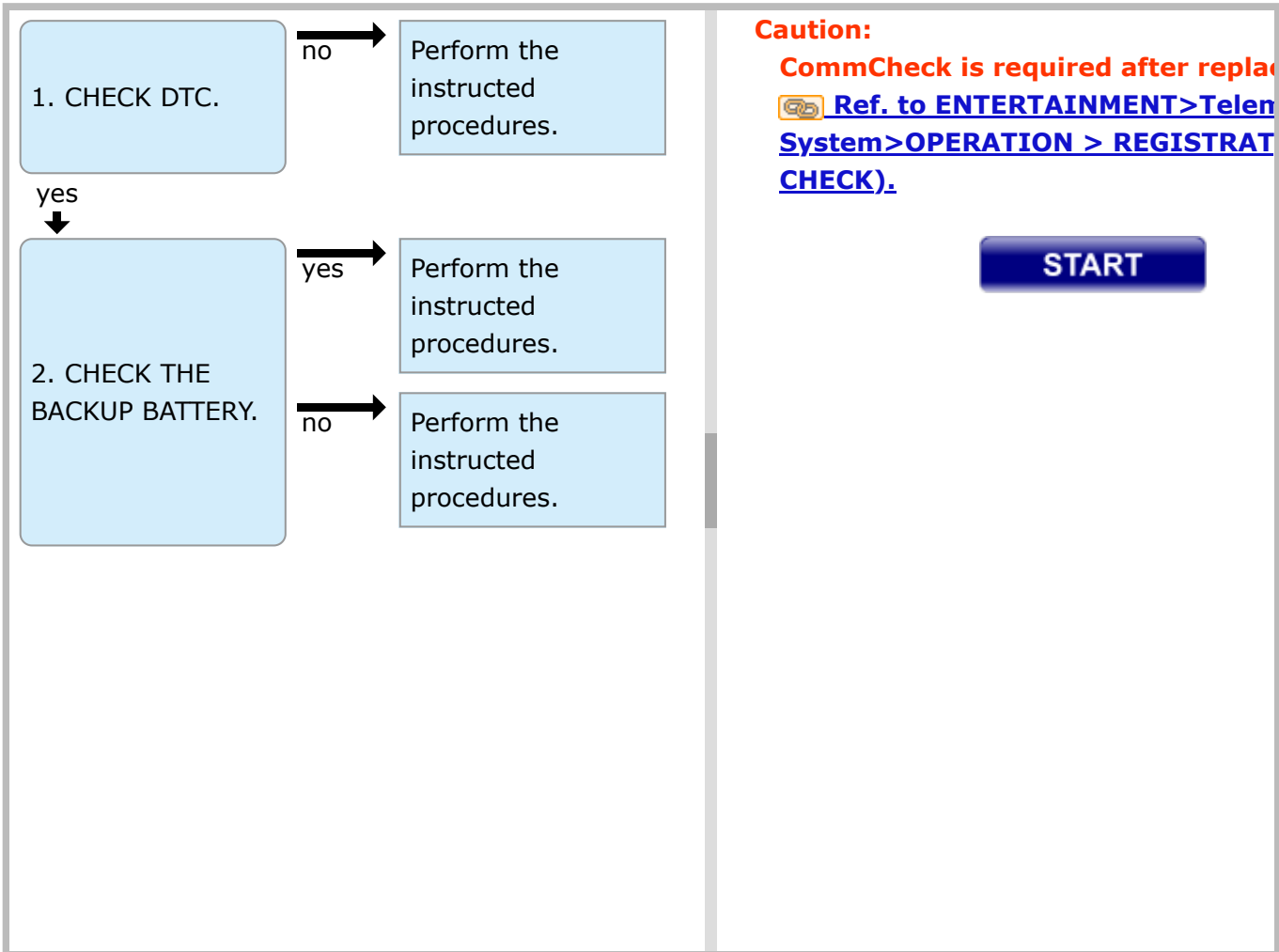
Caution:
CommCheck is required after replacement.
[Ref. to ENTERTAINMENT>Tele System>OPERATION > REGISTRAT CHECK\).](#)

START

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A07 BACKUP BATTERY CHARGE SYSTEM PERFORMANCE

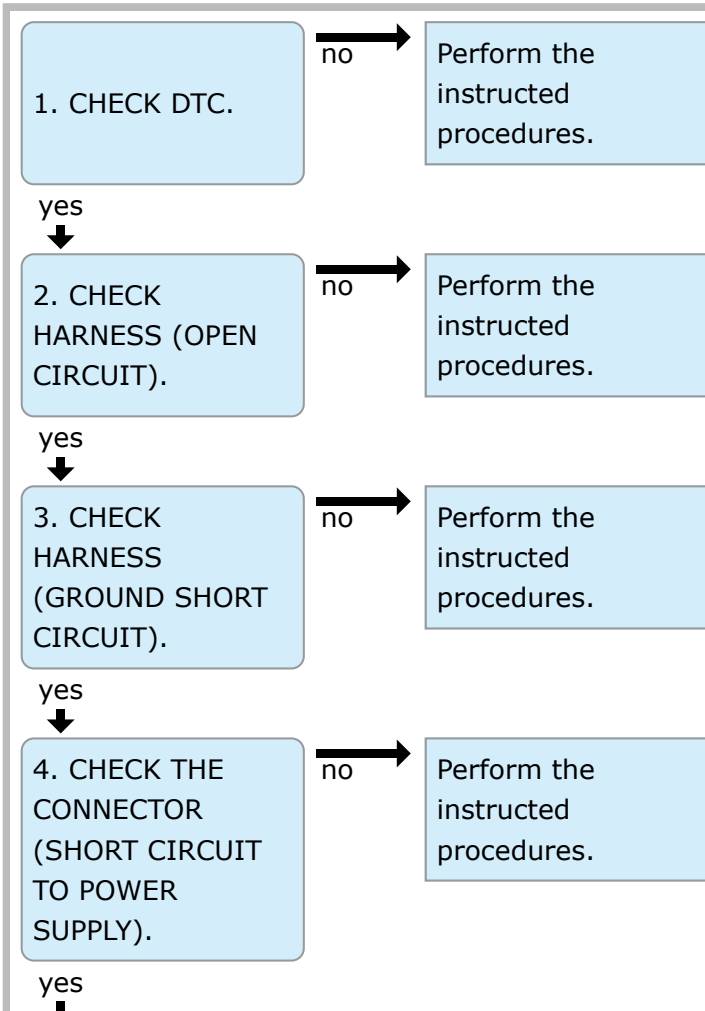
CAUTION/NOTE INTRO



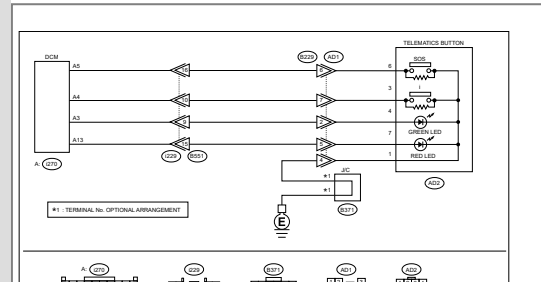
TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A08 SOS BUTTON CIRCUIT

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Telematics [Ref. to WIRING SYSTEM>Tele System>WIRING DIAGRAM.](#)



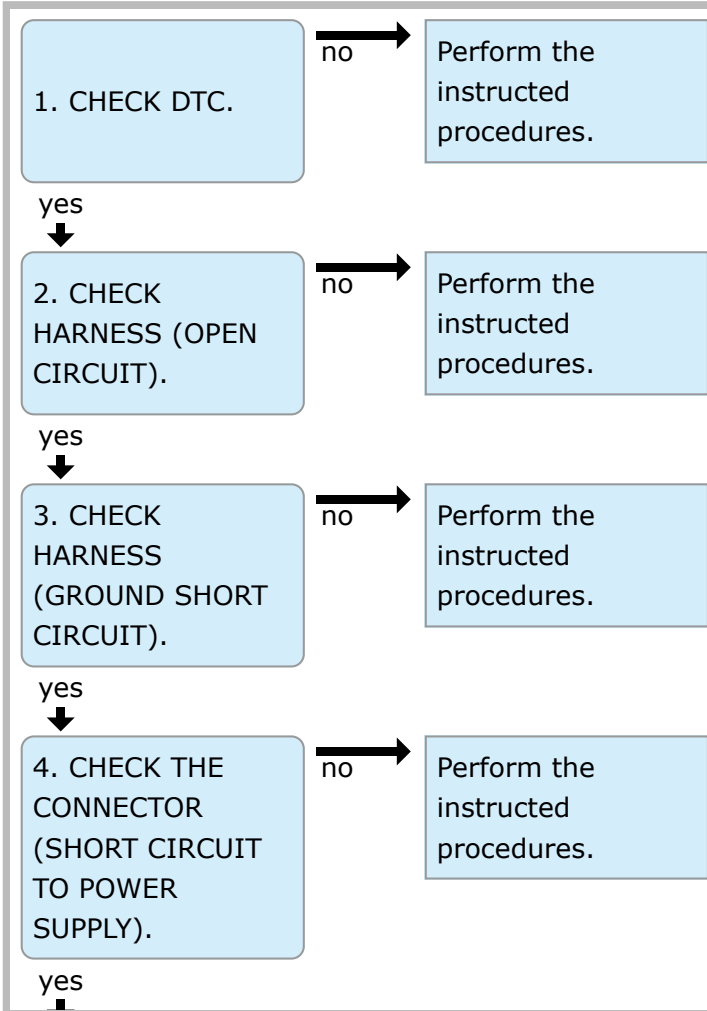
Caution:
CommCheck is required after replacement.
[Ref. to ENTERTAINMENT>Tele System>OPERATION > REGISTRAT CHECK\).](#)

START

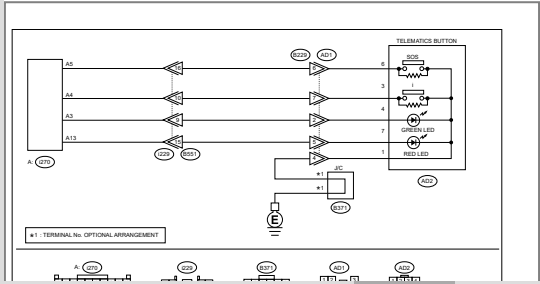
TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A09 I-CALL BUTTON CIRCUIT

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Telematics [Ref. to WIRING SYSTEM>Tele System>WIRING DIAGRAM.](#)



Caution:
CommCheck is required after replacement.
 [Ref. to ENTERTAINMENT>Tele System>OPERATION > REGISTRAT CHECK\).](#)

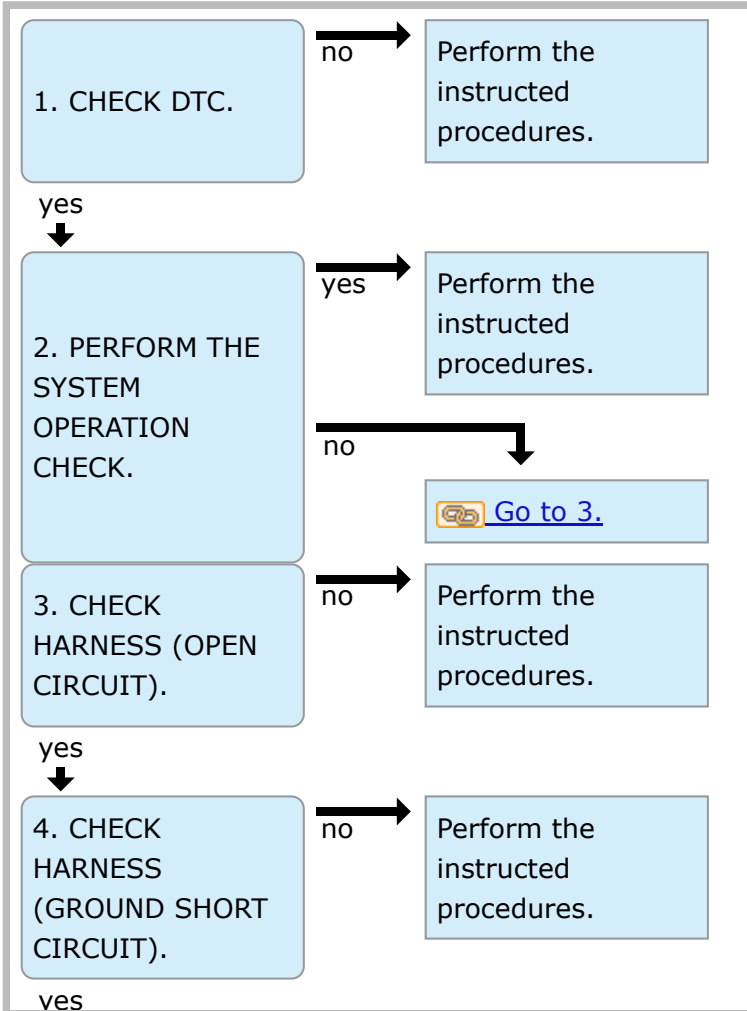
START

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

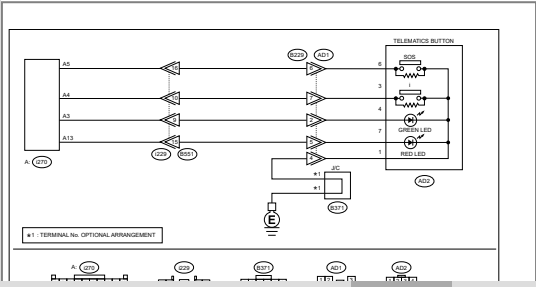
DTC B2A0A RED LED CIRCUIT

CAUTION/NOTE

INTRO



Wiring diagram:
 Telematics [Ref. to WIRING SYSTEM>Tele System>WIRING DIAGRAM.](#)



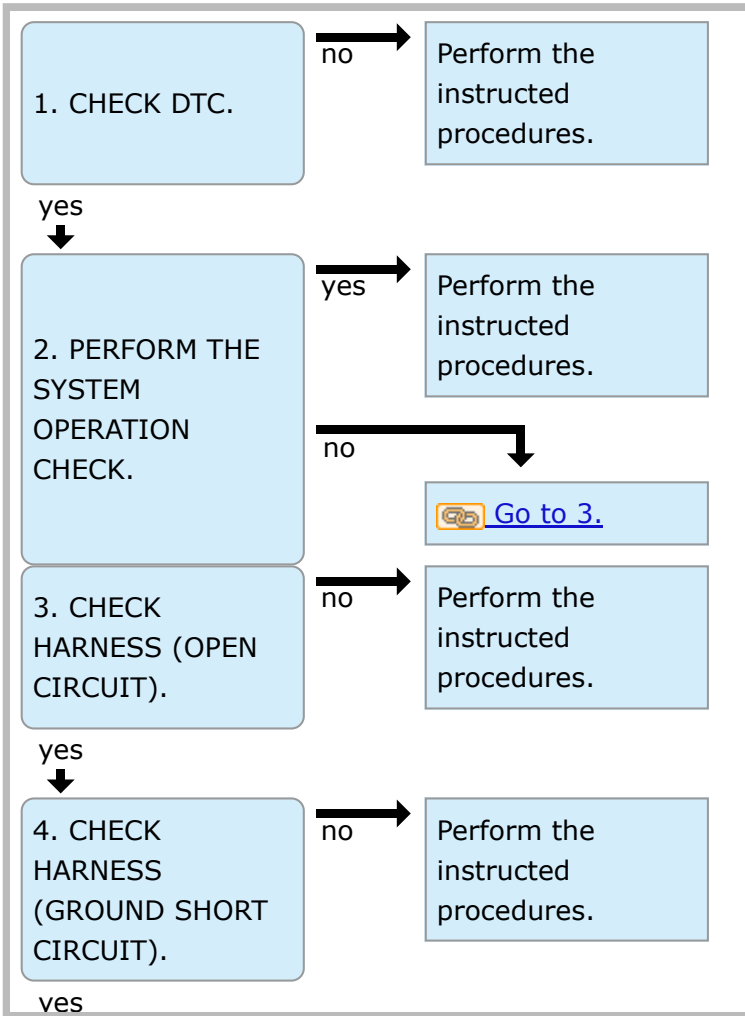
Caution:
CommCheck is required after replacement.
[Ref. to ENTERTAINMENT>Tele System>OPERATION > REGISTRATION CHECK\).](#)

START

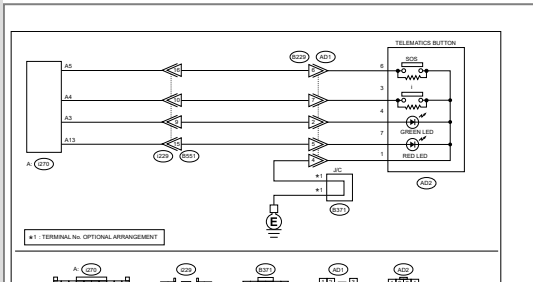
TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A0B GREEN LED CIRCUIT

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
 Telematics [Ref. to WIRING SYSTEM>Tele System>WIRING DIAGRAM.](#)



Caution:
CommCheck is required after replacement.
[Ref. to ENTERTAINMENT>Tele System>OPERATION > REGISTRATION CHECK\).](#)

START

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)


DTC B2A0C DCM PERFORMANCE

CAUTION/NOTE INTRO

1. CHECK DTC.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

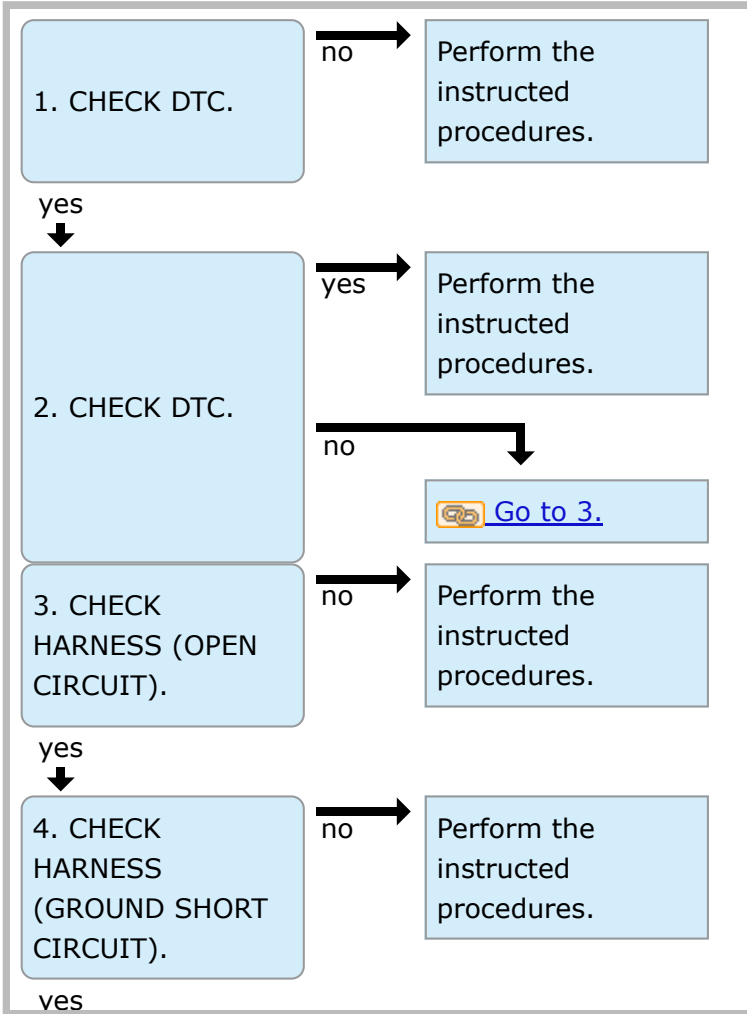
Caution:
CommCheck is required after replac
 [Ref. to ENTERTAINMENT>Telen](#)
[System>OPERATION > REGISTRAT](#)
[CHECK\).](#)

START

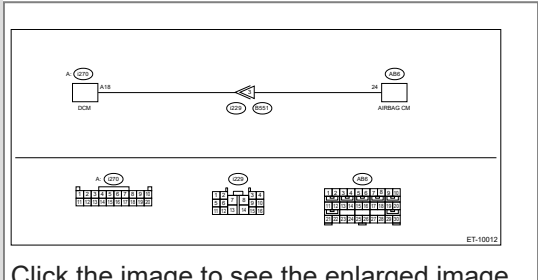
TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A0D AIRBAG SIGNAL PERFORMANCE

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Telematics [Ref. to WIRING SYSTEM>Tele System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

Caution:

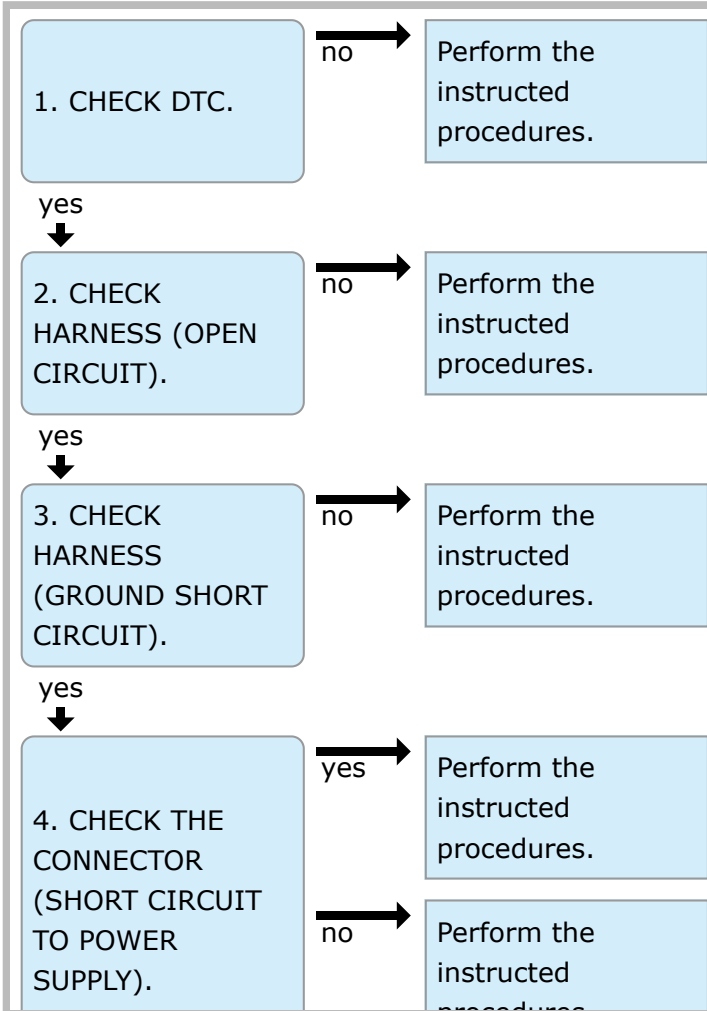
- **CommCheck is required after re DCM.** [Ref. to ENTERTAINMENT>Telematics System>OPERATION > REGISTER \(COMM CHECK\).](#)
- **Before performing diagnosis, refer to "CAUTION" in "General Description to AIRBAG SYSTEM>General Description>CAUTION.**

START

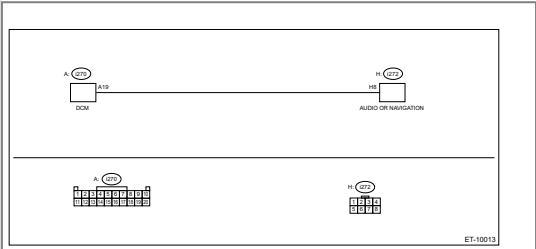
TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A0E MUTE LINE CIRCUIT

[CAUTION/NOTE](#) [INTRO](#)



Wiring diagram:
Telematics [Ref. to WIRING SYSTEM>Tele System>WIRING DIAGRAM.](#)



Click the image to see the enlarged image

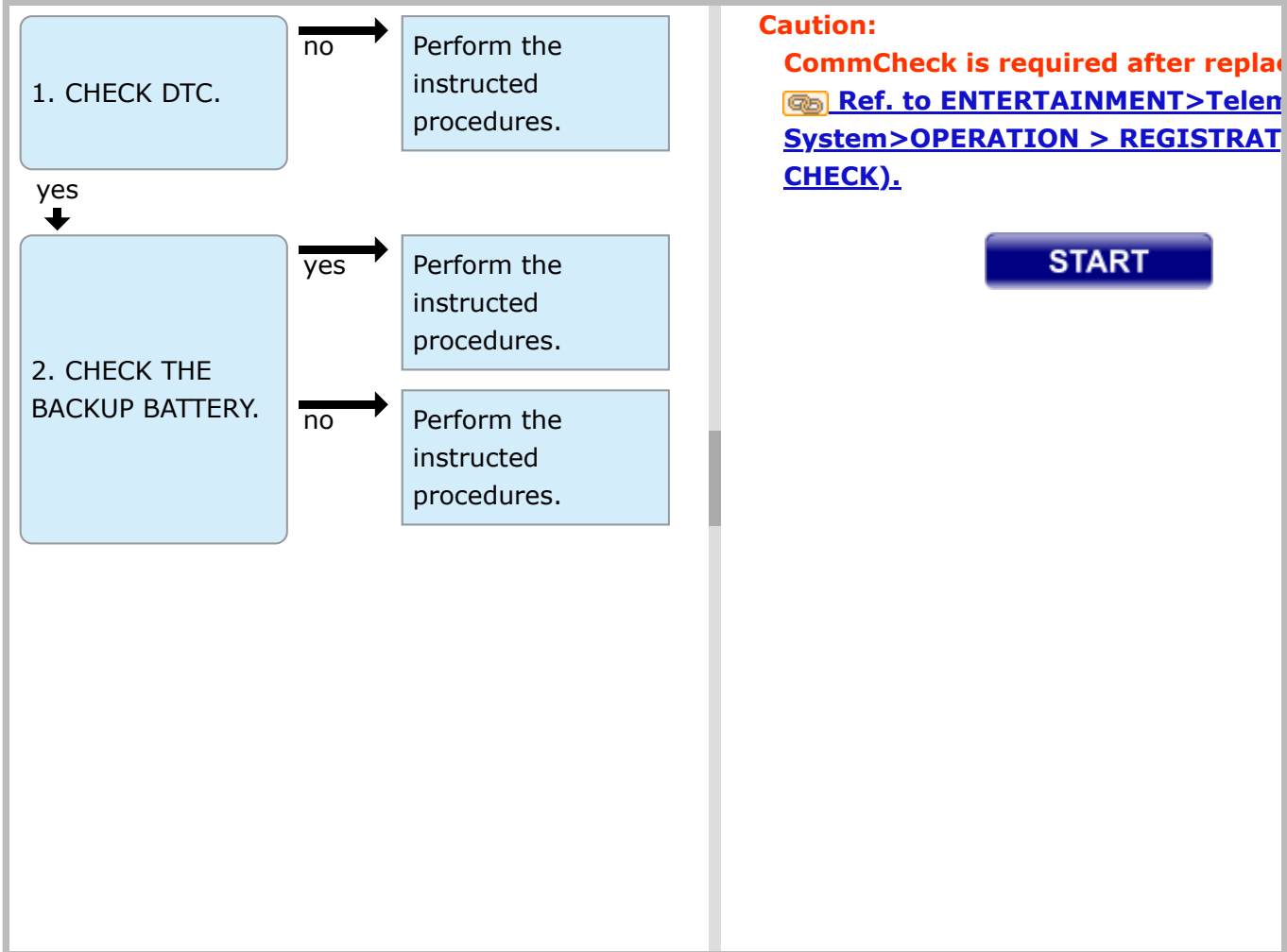
Caution:
CommCheck is required after replacement.
 [Ref. to ENTERTAINMENT>Tele System>OPERATION > REGISTRAT CHECK\).](#)

START

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A0F BACKUP BATTERY DEGRADATION

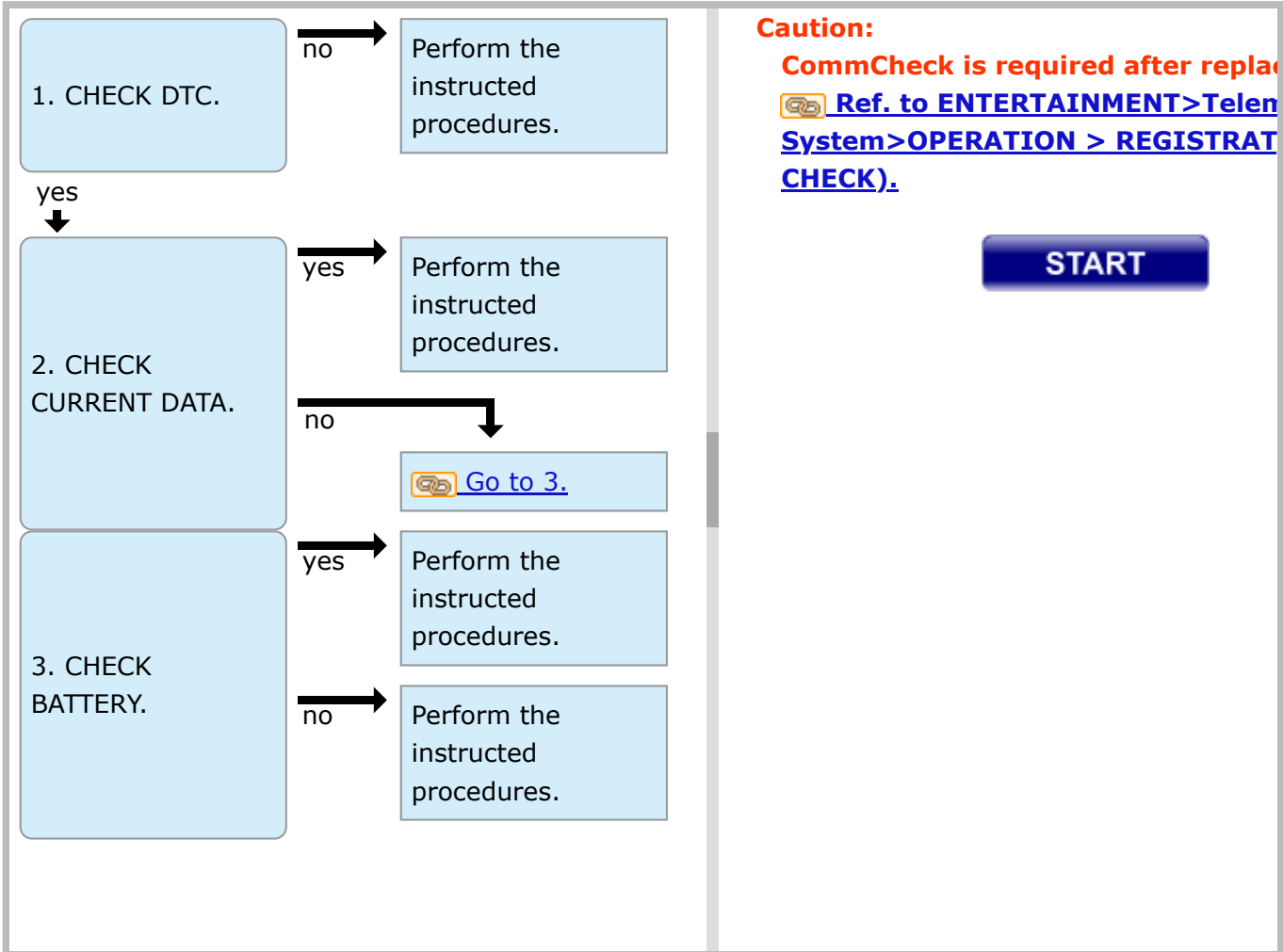
CAUTION/NOTE INTRO



TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A10 BATTERY VOLTAGE HIGH

CAUTION/NOTE INTRO




TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

Detected when CAN line abnormality is detected.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

Detected when CAN data from ECM does not arrive.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

Detected when CAN data from VDC does not arrive.

Note:


Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE

Detected when CAN data is not received from body integrated unit.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0151 LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE

Detected when CAN data is not received from airbag CM.

Note:


Perform the diagnosis for LAN system.  Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

Detected when CAN data from combination meter does not arrive.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"

Detected when CAN data from ECM is abnormal.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

This is detected when CAN data from VDC is abnormal.

Note:


Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0452 INVALID DATA RECEIVED FROM RESTRAINTS CONTROL MODULE











Detected when CAN data from airbag CM is abnormal.

Note:



Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

DTC	Item	Note
U0073	CONTROL MODULE COMMUNICATION BUS OFF	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0151	LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0151 LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0452	INVALID DATA RECEIVED FROM RESTRAINTS CONTROL MODULE	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0452 INVALID DATA RECEIVED FROM RESTRAINTS CONTROL MODULE.
B2A00	VIN READING	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A00 VIN READING.

B2A01	LTE1 ANTENNA CIRCUIT	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A01 LTE1 ANTENNA CIRCUIT.
B2A02	LTE2 ANTENNA CIRCUIT	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A02 LTE2 ANTENNA CIRCUIT.
B2A03	GPS ANTENNA CIRCUIT	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A03 GPS ANTENNA CIRCUIT.
B2A04	MIC CIRCUIT	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A04 MIC CIRCUIT.
B2A05	LEFT SPEAKER/AUDIO CIRCUIT	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A05 LEFT SPEAKER/AUDIO CIRCUIT.
B2A06	RIGHT SPEAKER/AUDIO CIRCUIT	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A06 RIGHT SPEAKER/AUDIO CIRCUIT.
B2A07	BACKUP BATTERY CHARGE SYSTEM PERFORMANCE	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A07 BACKUP BATTERY CHARGE SYSTEM PERFORMANCE.
B2A08	SOS BUTTON CIRCUIT	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A08 SOS BUTTON CIRCUIT.
B2A09	I-CALL BUTTON CIRCUIT	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A09 I-CALL BUTTON CIRCUIT.
B2A0A	RED LED CIRCUIT	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0A RED LED CIRCUIT.
B2A0B	GREEN LED CIRCUIT	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0B GREEN LED CIRCUIT.
B2A0C	DCM PERFORMANCE	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0C DCM PERFORMANCE.
B2A0D	AIRBAG SIGNAL PERFORMANCE	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0D AIRBAG SIGNAL PERFORMANCE.
B2A0E	MUTE LINE CIRCUIT	 Ref. to TELEMATICS SYSTEM

		(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0E MUTE LINE CIRCUIT.
B2A0F	BACKUP BATTERY DEGRADATION	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0F BACKUP BATTERY DEGRADATION.
B2A10	DTC B2A10 BATTERY VOLTAGE HIGH	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A10 BATTERY VOLTAGE HIGH.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Telematics], and then select [Enter].
5. On [Select Function] display, select [DTC].

Note:


- For detailed operation procedures, refer to “Application help”.
- For details concerning DTC, refer to the List of Diagnostic Trouble Codes (DTC).

 [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\)>LIST.](#)

INSPECTION

1. THE SYSTEM DOES NOT NOTIFY THE TELEMATICS SERVICE PROVIDER CENTER AUTOMATICALLY AFTER COLLISION

Note:

Perform the diagnostics for "Phone conversation is not possible. (The microphone does not respond to a voice. No sound is heard from the speaker.)".  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION >PHONE CONVERSATION IS NOT POSSIBLE. \(THE MICROPHONE DOES NOT RESPOND TO A VOICE. NO SOUND IS HEARD FROM THE SPEAKER.\)](#).


1. CHECK COLLISION TYPE.




Check the type of collision of the vehicle.

Is it a frontal collision, or a side collision, or a rollover?

Yes

 [Go to 2.](#)

No

For rear collision,  [Go to 4.](#)

2. CHECK AIRBAG WARNING LIGHT.



Check the airbag warning light.

Does the airbag warning light illuminate at all times?

Yes


 [Go to 3.](#)

No

There is no malfunction in the airbag system. Since the airbag CM does not transmit the collision detection signal in the event of a minor collision, it is normal that the automatic notification function does not work.

3. CHECK DTCS.




Read the DTC of [Airbag] using the Subaru Select Monitor.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\)](#).


P B **DTC**
C U **Check**

Is any of the DTC [Front Impact Deployment], [Side Impact Deployment], or [Rollover Ignition] displayed?


Yes

There is no malfunction in the airbag system.  [Go to 7.](#)

No


Perform the diagnosis for the airbag system.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

4. CHECK COLLISION DETECTION SIGNAL RECEPTION STATUS.

Display the data monitor [TimeStamp at ACN Event] of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Is a time stamp recorded?


Yes

 [Go to 7.](#)(Rear collision detection was activated)

No


 [Go to 5.](#)

5. CHECK DTCS.

Read DTCs of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes

Perform the diagnosis for the displayed DTCs.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\)>LIST.](#)

No


 [Go to 6.](#)

6. CHECK AIRBAG WARNING LIGHT.

Check the airbag warning light.

Does the airbag warning light illuminate at all times?

Yes


Perform the diagnosis for the airbag system.  [Ref. to AIRBAG\(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No

There is no malfunction in the airbag system. Since the airbag CM does not transmit the collision detection signal in the event of a minor collision, it is

normal that the automatic notification function does not work.

7. CHECK MODE STATUS.


Display the data monitor [Subscription Status] of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Is the data [Subscribed]?

Yes

 [Go to 8.](#)


NOTE:

If step 4 is in progress,  [Go to 9.](#)

No


This is not a malfunction because the function is limited in other than [Subscribed]. Press and hold the i-button for two seconds to enter [Subscribed].

8. CHECK DTCS.

Read DTCs of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?


Yes

Perform the diagnosis for the displayed DTCs.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\)>LIST.](#)

No


 [Go to 9.](#)

9. CHECK THE RECEIVED SIGNAL STRENGTH AT THE TIME OF THE ACCIDENT (CHECK THE DATA MONITOR).


Display the data monitor [RSSI at ACN Event] of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Is the data 26% or more?

Yes

 [Go to 11.](#)

No

 [Go to 10.](#)

10. CHECK SPECIFIED AREA.



1. Check whether the collision occurred within the specified area.
2. Display the data monitor [GPS Data at ACN Event] of the Telematics. [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Is the displayed location data indicated within the AT&T cellular coverage area? (For the AT&T cellular coverage area, refer to the AT&T website. The system operates only on 3G and 4G technology.)

Yes

[Go to 11.](#)

No

The collision occurred outside the specified area.

11. CHECK THE COMMUNICATION STATUS AT THE TIME OF THE ACCIDENT (CHECK THE DATA MONITOR).



Display the data monitor [Call Status at ACN Event] of the Telematics. [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

If the data shows [Call Started] or [Call Connected]; Go to A.

If the data shows [Call Not Started]; Go to B.

If the data shows [No Network Service]; Go to C.

If the data shows [Call Ended by SXM]; Go to D.

A

[Go to 12.](#)

B

Replace the DCM. [Ref. to ENTERTAINMENT>Data Communication Module.](#)

C

Replace the antenna. [Ref. to ENTERTAINMENT>Antenna.](#)

D

The connection ended due to a server-side reason; therefore, there is no failure on the vehicle.

12. CHECK THE TIME OF THE ACCIDENT (CHECK THE DATA MONITOR).



Display the data monitor [TimeStamp at ACN Event] of the Telematics. [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Note:

The time stamp is displayed in the Coordinated Universal Time (UTC), which is different from actual time at each location. Therefore, time difference needs to

be corrected for use.

Example: [12/22 01:30 in UTC time] is corrected as [12/21 20:30 in New York time].

Does the time of the accident match with the data?

Yes

Replace the antenna. [🔗 Ref. to ENTERTAINMENT>Antenna.](#)

No

Replace the DCM. [🔗 Ref. to ENTERTAINMENT>Data Communication Module.](#)

2. THE SYSTEM DOES NOT NOTIFY THE CENTER EVEN IF THE SOS BUTTON IS PRESSED

Note:

Perform the diagnostics for "Phone conversation is not possible. (The microphone does not respond to a voice. No sound is heard from the speaker.)". [🔗 Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostics with Phenomenon>INSPECTION >PHONE CONVERSATION IS NOT POSSIBLE. \(THE MICROPHONE DOES NOT RESPOND TO A VOICE. NO SOUND IS HEARD FROM THE SPEAKER.\)](#).

Warning:

CommCheck is required after replacing the DCM. [🔗 Ref. to ENTERTAINMENT>Telematics System>OPERATION > REGISTRATION \(COMM CHECK\)](#).

1. CHECK THE SUBSCRIPTION STATUS.

Display the data monitor [SOS Active] of the Telematics. [🔗 Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor](#).

Is the data TRUE?

Yes

[🔗 Go to 2.](#)

No

The user does not have a service subscription; therefore, it is not a failure.

2. CHECK DTCS.

Read DTCs of the Telematics. [🔗 Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\)](#).

Is DTC displayed?

Yes


Perform the diagnosis for the displayed DTCs. [🔗 Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\)>LIST](#).

No

 [Go to 3.](#)

3. CHECK THE RECEIVED SIGNAL STRENGTH WHEN THE SOS SWITCH WAS PRESSED (CHECK THE DATA MONITOR).



Display the data monitor [RSSI at SOS/ICALL(1)] of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Is the data 26% or more?

Yes


 [Go to 5.](#)

No

 [Go to 4.](#)

4. CHECK THE AT&T CELLULAR COVERAGE AREA.



1. Check whether the SOS button was pressed within the cellular coverage area.
2. Display the data monitor [GPS Data at Time of Button Push(1)] of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Is the displayed location data indicated within the AT&T cellular coverage area? (For the AT&T cellular coverage area, refer to the AT&T website. The system operates only on 3G and 4G technology.)

Yes


 [Go to 5.](#)

No

The SOS button was pressed outside the cellular coverage area.

5. CHECK THE COMMUNICATION STATUS OF WHEN THE SOS BUTTON WAS PRESSED (CHECK THE DATA MONITOR).



Display the data monitor [Call status at SOS/ICALL Event(1)] of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

If the data shows [Call Started] or [Call Connected]; Go to A.

If the data shows Call Not Started; Go to B.

If the data shows [No Network Service]; Go to C.

If the data shows Call Ended by SXM; Go to D.


A

 [Go to 6.](#)

B

 [Go to 7.](#)


C

Replace the antenna.  [Ref. to ENTERTAINMENT>Antenna.](#)

D

The connection ended due to a server-side reason; therefore, there is no failure on the vehicle.

6. CHECK THE TIME OF WHEN THE SOS BUTTON WAS PRESSED (CHECK THE DATA MONITOR).

Display the data monitor [Timestamp at Time of Button Push(1)] of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Note:

The time stamp is displayed in the Coordinated Universal Time (UTC), which is different from actual time at each location. Therefore, time difference needs to be corrected for use.


Example: [12/22 01:30 in UTC time] is corrected as [12/21 20:30 in New York time].

Does the time of the SOS switch operation match with the data?


Yes

 [Go to 7.](#)

No

Replace the DCM.  [Ref. to ENTERTAINMENT>Data Communication Module.](#)

7. CHECK THE SOS BUTTON.

Check the SOS button.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2A08 SOS BUTTON CIRCUIT.](#)

Is the check result OK?

Yes

Replace the DCM.  [Ref. to ENTERTAINMENT>Data Communication Module.](#)

No

Replace the SOS button.  [Ref. to ENTERTAINMENT>Switches and Harness.](#)

3. THE SYSTEM PLACES AN SOS CALL UNINTENTIONALLY DURING DRIVING

1. CHECK DTCS.

Read DTCs of the Telematics. [🔗 Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes

Perform the diagnosis for the displayed DTCs. [🔗 Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\)>LIST.](#)

No

Check the SOS button. [🔗 Ref. to ENTERTAINMENT>Switches and Harness.](#)

4. THE SYSTEM DOES NOT NOTIFY THE CENTER EVEN IF THE I-BUTTON IS PRESSED UPON VEHICLE MALFUNCTION

Note:

Perform the diagnostics for "Phone conversation is not possible. (The microphone does not respond to a voice. No sound is heard from the speaker.)".

Warning:

CommCheck is required after replacing the DCM. [🔗 Ref. to ENTERTAINMENT>Telematics System>OPERATION > REGISTRATION \(COMM CHECK\).](#)

1. CHECK THE SUBSCRIPTION STATUS.

Display the data monitor [ICALL Active] of the Telematics. [🔗 Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Is the data TRUE?

Yes

[🔗 Go to 2.](#)

No

The user does not have a service subscription; therefore, it is not a failure.

2. CHECK DTCS.

Read DTCs of the Telematics. [🔗 Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC displayed?

Yes

Perform the diagnosis for the displayed DTCs. [🔗 Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\)>LIST.](#)

No

[🔗 Go to 3.](#)

3. CHECK RECEIVED SIGNAL STRENGTH WHEN I-BUTTON WAS PRESSED (CHECK DATA MONITOR).



Display the data monitor [RSSI at SOS/ICALL(1)] of the Telematics. [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Is the data 26% or more?

Yes

[Go to 5.](#)

No

[Go to 4.](#)

4. CHECK THE AT&T CELLULAR COVERAGE AREA.



1. Check whether the i-button was pressed within the cellular coverage area.
2. Display the data monitor [GPS Data at Time of Button Push(1)] of the Telematics. [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Is the displayed location data indicated within the AT&T cellular coverage area? (For the AT&T cellular coverage area, refer to the AT&T website. The system operates only on 3G and 4G technology.)

Yes

[Go to 5.](#)

No

The i-button was pressed outside the cellular coverage area.

5. CHECK COMMUNICATION STATUS OF WHEN I-BUTTON WAS PRESSED (CHECK DATA MONITOR).



Display the data monitor [Call status at SOS/ICALL Event(1)] of the Telematics. [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

If the data shows [Call Started] or [Call Connected]; Go to A.

If the data shows Call Not Started; Go to B.

If the data shows [No Network Service]; Go to C.

If the data shows Call Ended by SXM; Go to D.

A

[Go to 6.](#)

B

[Go to 7.](#)


C

Replace the antenna. [Ref. to ENTERTAINMENT>Antenna.](#)

D

The connection ended due to a server-side reason; therefore, there is no failure on the vehicle.

6. CHECK COMMUNICATION STATUS OF WHEN I-BUTTON WAS PRESSED (CHECK DATA MONITOR).

Display the data monitor [Timestamp at Time of Button Push(1)] of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Note:

The time stamp is displayed in the Coordinated Universal Time (UTC), which is different from actual time at each location. Therefore, time difference needs to be corrected for use.

Example: [12/22 01:30 in UTC time] is corrected as [12/21 20:30 in New York time].

Does the time of the i-button operation match with the data?


Yes

 [Go to 7.](#)

No

Replace the DCM.  [Ref. to ENTERTAINMENT>Data Communication Module.](#)

7. CHECK I-BUTTON.

Check the i-button.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2A09 I-CALL BUTTON CIRCUIT.](#)

Is the check result OK?

Yes


Replace the DCM.  [Ref. to ENTERTAINMENT>Data Communication Module.](#)

No

Replace the i-button.  [Ref. to ENTERTAINMENT>Switches and Harness.](#)

5. REMOTE VEHICLE LOCATOR CANNOT LOCATE THE VEHICLE

1. CHECK THE SUBSCRIPTION STATUS.

Display the data monitor [Account Status] of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Is the data [TRUE]?



Yes

 [Go to 2.](#)

No

The user does not have a service subscription; therefore, it is not a failure.

2. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.

Check that the user's smartphone can be connected to the Internet.

Can it be connected to the Internet?

Yes

 [Go to 3.](#)

No

The user's smartphone or the Internet environment has a problem.

3. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.

Check that the user's smartphone can display the current location.

Is the current location displayed?


Yes

Currently no failure is found. If the current location is not displayed, the user's Internet environment (radio waves, etc.) possibly had a problem.

No

 [Go to 4.](#)

4. CHECK THE CURRENT RECEIVED SIGNAL STRENGTH (CHECK THE DATA MONITOR).

Display the data monitor [Signal Strength] of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Is the data 26% or more?

Yes

 [Go to 6.](#)

No

 [Go to 5.](#)

5. CHECK THE AT&T CELLULAR COVERAGE AREA.

Ask the user where he/she operated the remote control.

Is the location of the remote control operation within the AT&T cellular coverage area? (For the AT&T cellular coverage area, refer to the AT&T website. The system operates only on 3G and 4G technology.)

Yes



 [Go to 6.](#)

No

The location of the remote control operation was outside the cellular coverage area.



6. CHECK DTCS.

Check DTCs in the following systems.

- Body control  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)
- Telematics  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes

Perform the diagnosis for the displayed DTCs of body control, or of telematics.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\)>LIST.](#)

No


Check the Starlink Server report to verify that there was no server outage that coincides with the day/time the customer reported that the issue occurred. (Refer to STARLINK Server Maintenance/Down Report under Reports and Starlink section in Subarunet.) If no outage exists for that time frame, it is possible that there was environmental interference (radio waves, etc.) when the user performed the operation. No further actions are recommended.

6. REMOTE VEHICLE LOCATOR INDICATES AN INCORRECT LOCATION FOR THE VEHICLE

Warning:


CommCheck is required after replacing the DCM.  [Ref. to ENTERTAINMENT>Telematics System>OPERATION > REGISTRATION \(COMM CHECK\).](#)

1. CHECK DTCS.


Read DTCs of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes

Perform the diagnosis for the displayed DTCs.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\)>LIST.](#)

No

 [Go to 2.](#)

2. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.

Check that the user's smartphone can display the current location.

Is it displayed correctly? (Is a deviation, if any, less than 100 m (328 ft)?)

Yes

Currently no failure is found. When the user had a problem, there was a failure with the GPS antenna reception environment, etc.

No

 [Go to 3.](#)

3. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.


Check again that the user's smartphone can display the current location in a place where the sky is open.

Is it displayed correctly? (Is a deviation, if any, less than 100 m (328 ft)?)

Yes


Currently no failure is found. When the user had a problem, there was a failure with the GPS antenna reception environment, etc.

No

Replace the DCM.  [Ref. to ENTERTAINMENT>Data Communication Module.](#)

7. REMOTE DOOR LOCK DOES NOT LOCK THE DOORS OF THE VEHICLE

1. CHECK THE SUBSCRIPTION STATUS.

Display the data monitor [Account Status] of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Is the data TRUE?

Yes

 [Go to 2.](#)

No

The user does not have a service subscription; therefore, it is not a failure.

2. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.

Check that the user's smartphone can be connected to the Internet.

Can it be connected to the Internet?

Yes

 [Go to 3.](#)

No

The user's smartphone or the Internet environment has a problem.

3. CHECK THE DOOR LOCK FUNCTION.

Check that the user's smartphone can lock the doors in the current situation.

Are the doors locked?


Yes

Currently no failure is found. When the user had a problem, there was a failure with the Internet connection environment, etc.

No

 [Go to 4.](#)

4. CHECK THE CURRENT RECEIVED SIGNAL STRENGTH (CHECK THE DATA MONITOR).

Display the data monitor [Signal Strength] of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Is the data 26% or more?

Yes

 [Go to 6.](#)

No

 [Go to 5.](#)

5. CHECK THE AT&T CELLULAR COVERAGE AREA.

Ask the user where he/she operated the remote control.

Is the location of the remote control operation within the AT&T cellular coverage area? (For the AT&T cellular coverage area, refer to the AT&T website. The system operates only on 3G and 4G technology.)

Yes

 [Go to 6.](#)

No

The location of the remote control operation was outside the cellular coverage area.

6. CHECK THE DOOR LOCK FUNCTION.


Check that the keyless transmitter can lock the doors of the vehicle.

Are the doors locked?

Yes



 [Go to 7.](#)

No

Perform the diagnosis according to the inspection for the door lock control system.  [Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION.](#)



7. CHECK DTCS.

Check DTCs in the following systems.

- Body control  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)
- Telematics  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes


Perform the diagnosis for the displayed DTCs of body control, or of telematics.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\)>LIST.](#)

No

Check the Starlink Server report to verify that there was no server outage that coincides with the day/time the customer reported that the issue occurred. (Refer to STARLINK Server Maintenance/Down Report under Reports and Starlink section in Subarunet.) If no outage exists for that time frame, it is possible that there was environmental interference (radio waves, etc.) when the user performed the operation. No further actions are recommended.

8. THE DOORS LOCK UNINTENTIONALLY

1. CHECK DOOR LOCK SWITCH.


Check the door lock switch.  [Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION.](#)

Is the check result OK?

Yes


Check the Starlink Server report to verify that there was no server outage that coincides with the day/time the customer reported that the issue occurred. (Refer to STARLINK Server Maintenance/Down Report under Reports and Starlink section in Subarunet.) If no outage exists for that time frame, it is possible that there was environmental interference (radio waves, etc.) when the user performed the operation. No further actions are recommended.

No

Perform the diagnosis according to the inspection for the door lock switch.  [Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION.](#)

9. THE DOORS UNLOCK UNINTENTIONALLY

1. CHECK DOOR LOCK SWITCH.


Check the door unlock switch.  [Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION.](#)

Is the check result OK?

Yes


Check the Starlink Server report to verify that there was no server outage that coincides with the day/time the customer reported that the issue occurred. (Refer to STARLINK Server Maintenance/Down Report under Reports and Starlink section in Subarunet.) If no outage exists for that time frame, it is possible that there was environmental interference (radio waves, etc.) when the user performed the operation. No further actions are recommended.

No

Perform the diagnosis according to the inspection for the door lock switch.  [Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION.](#)

10. REMOTE HORN & HAZARD LIGHTS DO NOT OPERATE UPON REQUEST

1. CHECK THE SUBSCRIPTION STATUS.

Display the data monitor [Account Status] of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Does the data display [TRUE]?

Yes

 [Go to 2.](#)

No


The user does not have a service subscription; therefore, it is not a failure.

2. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.

Check that the user's smartphone can be connected to the Internet.

Can it be connected to the Internet?

Yes

 [Go to 3.](#)

No

The user's smartphone or the Internet environment has a problem.

3. CHECK THE HORN AND HAZARD LIGHT FUNCTIONS.

Check that the horn and hazard light currently operate by the user's smartphone.

Do the horn and hazard light operate?


Yes

Currently no failure is found. When the user had a problem, there was a failure with the Internet connection environment, etc.

No

 [Go to 4.](#)

4. CHECK THE CURRENT RECEIVED SIGNAL STRENGTH (CHECK THE DATA MONITOR).

Display the data monitor [Signal Strength] of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Does the data indicate 26% or more?

Yes

 [Go to 6.](#)

No


 [Go to 5.](#)

5. CHECK THE AT&T CELLULAR COVERAGE AREA.

Ask the user where he/she operated the remote control.

Is the location of the remote control operation within the AT&T cellular coverage area? (For the AT&T cellular coverage area, refer to the AT&T website. The system operates only on 3G and 4G technology.)

Yes

 [Go to 6.](#)

No

The location of the remote control operation was outside the cellular coverage area.

6. CHECK THE HORN AND HAZARD LIGHT FUNCTIONS.

Check that the horn and hazard light operate by the keyless transmitter. (Press the lock button three times.)

Do the horn and hazard light operate?


Yes

 [Go to 8.](#)

No



 [Go to 7.](#)

7. CHECK HORN OPERATION.

Activate the active test [Horn Output] of the body integrated unit.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Active Test.](#)

Does the horn sound?

Yes



Check the keyless transmitter.  [Ref. to SECURITY AND LOCKS>Keyless Transmitter.](#)  [Ref. to SECURITY AND LOCKS>Access Key.](#)

No

Check the horn circuit.  [Ref. to WIRING SYSTEM>Horn System.](#)



8. CHECK DTCS.

Check DTCs in the following systems.

- Body control  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)
- Telematics  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes


Perform the diagnosis for the displayed DTCs of body control, or of telematics.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\)>LIST.](#)

No

Check the Starlink Server report to verify that there was no server outage that coincides with the day/time the customer reported that the issue occurred. (Refer to STARLINK Server Maintenance/Down Report under Reports and Starlink section in Subarunet.) If no outage exists for that time frame, it is possible that there was environmental interference (radio waves, etc.) when the user performed the operation. No further actions are recommended.

11. WHEN THE VEHICLE SECURITY ALARM IS ACTIVATED, NOTIFICATION IS NOT SENT

1. CHECK THE SUBSCRIPTION STATUS.

Display the data monitor [Account Status] of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Does the data display [TRUE]?

Yes

 [Go to 2.](#)

No

The user does not have a service subscription; therefore, it is not a failure.

2. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.

Check that the user's smartphone can be connected to the Internet.

Can it be connected to the Internet?

Yes

 [Go to 3.](#)

No

The user's smartphone or the Internet environment has a problem.

3. CHECK THE SECURITY ALERT SYSTEM.


Operate the security alert system.

Does it operate?

Yes

 [Go to 4.](#)

No

Check the security alert system.  [Ref. to SECURITY AND LOCKS>Security System>INSPECTION.](#)

4. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.


Check that a notification is sent to the user's smartphone after the security alert is activated.

Does the smartphone receive a notification?


Yes

Currently no failure is found.

No

 [Go to 5.](#)

5. CHECK THE CURRENT RECEIVED SIGNAL STRENGTH (CHECK THE DATA MONITOR).

Display the data monitor [Signal Strength] of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Does the data indicate 26% or more?

Yes

 [Go to 7.](#)

No

 [Go to 6.](#)

6. CHECK THE AT&T CELLULAR COVERAGE AREA.

Ask the user where he/she operated the remote control.

Is the location of the remote control operation within the AT&T cellular coverage area? (For the AT&T cellular coverage area, refer to the AT&T website. The system operates only on 3G and 4G technology.)

Yes

 [Go to 7.](#)



No

The location of the remote control operation was outside the cellular coverage

area.



7. CHECK DTCS.

Check DTCs in the following systems.

- Body control  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)
- Telematics  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes

Perform the diagnosis for the displayed DTCs of body control, or of telematics.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\)>LIST.](#)

No

Check the Starlink Server report to verify that there was no server outage that coincides with the day/time the customer reported that the issue occurred. (Refer to STARLINK Server Maintenance/Down Report under Reports and Starlink section in SubaruNet.) If no outage exists for that time frame, it is possible that there was environmental interference (radio waves, etc.) when the user performed the operation. No further actions are recommended.

12. WHEN A MALFUNCTION INDICATOR LIGHT/WARNING LIGHT IS LIT, NOTIFICATION IS NOT SENT

1. CHECK THE SUBSCRIPTION STATUS.

Display the data monitor [Diagnostic Alert Active] of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Does the data display TRUE?

Yes

 [Go to 2.](#)

No

The user does not have a service subscription; therefore, it is not a failure.

2. CHECK WARNING LIGHT.

Check if the warning light illuminates.

Does it Illuminate?


Yes

 [Go to 3.](#)

No


Currently no failure is found. Since the warning light is not lit, notification is not sent.

3. CHECK DTCS.

Check the DTC of telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC displayed?

Yes

Perform the diagnosis for the displayed DTCs.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\)>LIST.](#)

No

 [Go to 4.](#)

4. CHECK THE AT&T CELLULAR COVERAGE AREA.

Ask the user where he/she turned the ignition switch to OFF after the warning light was lit.

Is the location, where the ignition switch was turned to OFF after the warning light was lit, within the AT&T cellular coverage area? (For the AT&T cellular coverage area, refer to the AT&T website. The system operates only on 3G and 4G technology.)

Yes


Check the Starlink Server report to verify that there was no server outage that coincides with the day/time the customer reported that the issue occurred. (Refer to STARLINK Server Maintenance/Down Report under Reports and Starlink section in Subarunet.) If no outage exists for that time frame, it is possible that there was environmental interference (radio waves, etc.) when the user performed the operation. No further actions are recommended.

No

The location where the ignition switch was turned to OFF (where warning light illumination information was sent) was outside the cellular coverage area.

13. MAINTENANCE NOTIFICATIONS ARE NOT SENT

1. CHECK THE SUBSCRIPTION STATUS.

Display the data monitor [Maintenance Alert Active] of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Does the data display [TRUE]?

Yes


 [Go to 2.](#)

No

The user does not have a service subscription; therefore, it is not a failure.


2. CHECK DTCS.



Read DTCs of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes

Perform the diagnosis for the displayed DTCs.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\)>LIST.](#)

No

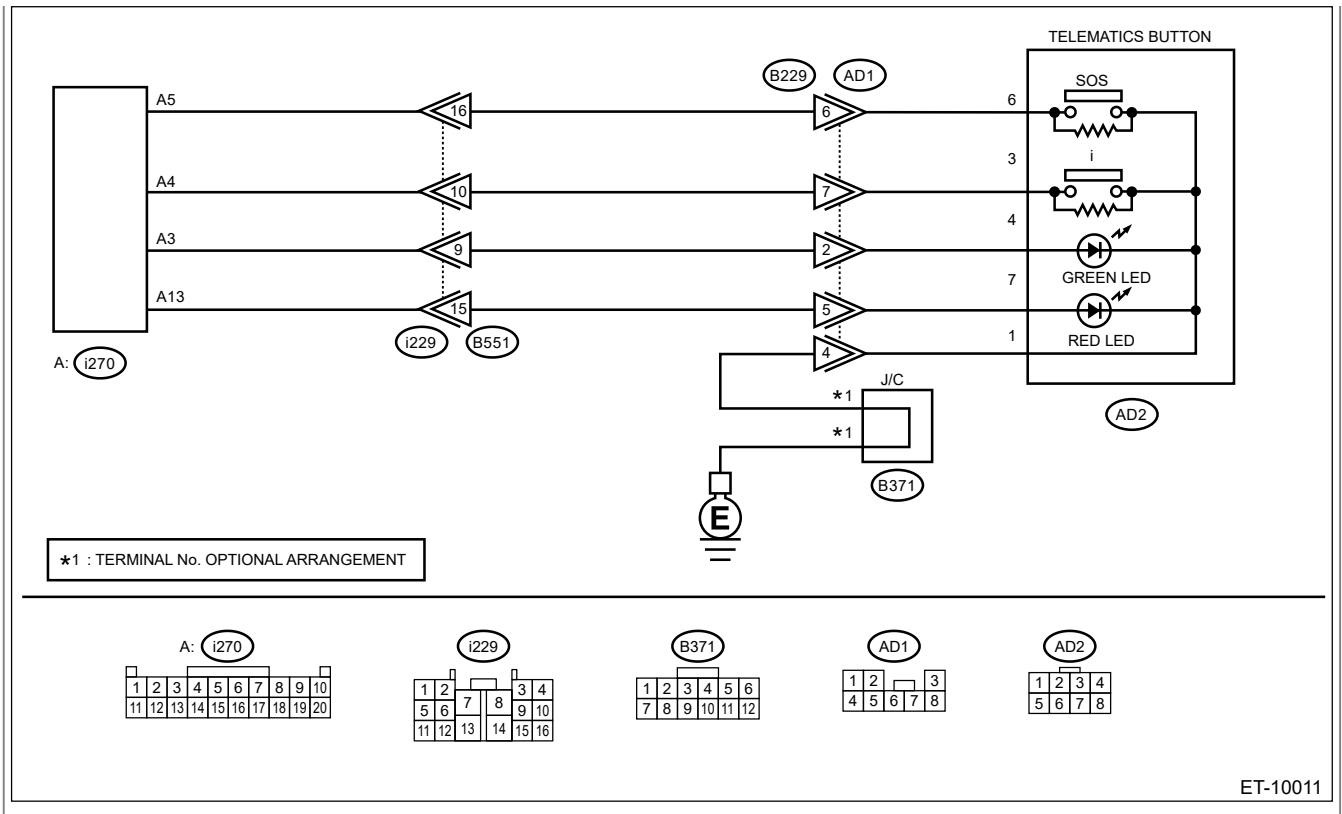
Check the Starlink Server report to verify that there was no server outage that coincides with the day/time the customer reported that the issue occurred. (Refer to STARLINK Server Maintenance/Down Report under Reports and Starlink section in Subarunet.) If no outage exists for that time frame, it is possible that there was environmental interference (radio waves, etc.) when the user performed the operation. No further actions are recommended.

14. THE LED DOES NOT DISPLAY THE STATUS. (LED MALFUNCTION)

Wiring diagram:

Telematics  [Ref. to WIRING SYSTEM>Telematics System>WIRING DIAGRAM.](#)





Warning:

CommCheck is required after replacing the DCM. [Ref. to ENTERTAINMENT>Telematics System>OPERATION > REGISTRATION \(COMM CHECK\).](#)

1. CHECK THE SUBSCRIPTION STATUS.

Display the data monitor [Account Status] of the Telematics. [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Data Monitor.](#)

Is the data [TRUE]?

Yes

[Go to 2.](#)

No

The user does not have a service subscription; therefore, it is not a failure. (Both LEDs are turned off.)

2. CHECK THE LED.

1. Turn the ignition switch to ON.
2. Check the LED condition.

Does the RED LED go off and the GREEN LED illuminate?

The circuit has returned to a normal condition at this time. Reproduce the

Yes

failure, and then perform the diagnosis again.

Note:


In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

 [Go to 3.](#)



3. CHECK DTCS.



Read DTCs of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2A0A or B2A0B displayed?

Yes


Perform the diagnosis for the displayed DTC B2A0A or B2A0B.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2A0A RED LED CIRCUIT.](#)  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2A0B GREEN LED CIRCUIT.](#)

No

 [Go to 4.](#)

4. CHECK THE LED ILLUMINATION CONDITION.



Perform the active test for the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Active Test.](#)

Is the LED turned on or off?

Yes

 [Go to 5.](#)

No

 [Go to 6.](#)

5. CHECK THE LED.



1. Turn the ignition switch to ON.
2. Check the LED condition.

Does the RED LED go off and the GREEN LED illuminate?


Yes

The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

Replace the DCM.  [Ref. to ENTERTAINMENT>Data Communication Module.](#)

6. CHECK THE LED.

Measure the continuity of the telematics button (LED) unit.


Connector & terminal

(AD2) No.4 — (AD2) No.1:


(AD2) No.7 — (AD2) No.1:

Is there continuity?

Yes


Replace the DCM.  [Ref. to ENTERTAINMENT>Data Communication Module.](#)

No

Replace the telematics button.  [Ref. to ENTERTAINMENT>Switches and Harness.](#)

15. PHONE CONVERSATION IS NOT POSSIBLE. (THE MICROPHONE DOES NOT RESPOND TO A VOICE. NO SOUND IS HEARD FROM THE SPEAKER.)

1. CHECK DTCS.

Read DTCs of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC B2A04, B2A05 or B2A06 displayed?


Yes

Perform the diagnosis for the displayed DTC B2A04, B2A05 or B2A06.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2A04 MIC CIRCUIT.](#)  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2A05 LEFT SPEAKER/AUDIO CIRCUIT.](#)  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2A06 RIGHT SPEAKER/AUDIO CIRCUIT.](#)

No

 [Go to 2.](#)

2. CHECK THE SPEAKER OPERATION.

Perform [Speaker ON] of the active test for the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Active Test.](#)

Does it sound?

Yes

 [Go to 3.](#)

No

 [Go to 4.](#)

3. CHECK MICROPHONE.



Perform the microphone voice input.

Is the voice recognized?

Yes

 [Go to 4.](#)

No

Replace the microphone.

4. CHECK THE SPEAKER.



Check the speaker.

Is the check result OK?

Yes

 [Go to 5.](#)

No

Replace the speaker.

5. CHECK THE TELEPHONE CALL.



1. Place the mobile phone in the vehicle.
2. Establish a Bluetooth connection between the mobile phone in the vehicle and the vehicle unit.
3. Make a call from outside to the mobile phone in the vehicle.
4. Check that a telephone call is available through the in-vehicle microphone with the hands-free function.

Is a telephone call successful?

Yes


The circuit has returned to a normal condition at this time. Reproduce the

failure, and then perform the diagnosis again.

Note:


In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No

Perform the diagnosis according to inspection for DTC B2A04 MIC CIRCUIT.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B2A04 MIC CIRCUIT.](#)


16. THE SYSTEM PLACES AN I-CALL UNINTENTIONALLY DURING DRIVING

1. CHECK DTCS.

Read DTCs of the Telematics.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes









Perform the diagnosis for the displayed DTCs.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\)>LIST.](#)









No

Check the i-button.  [Ref. to ENTERTAINMENT>Switches and Harness.](#)

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostics with Phenomenon

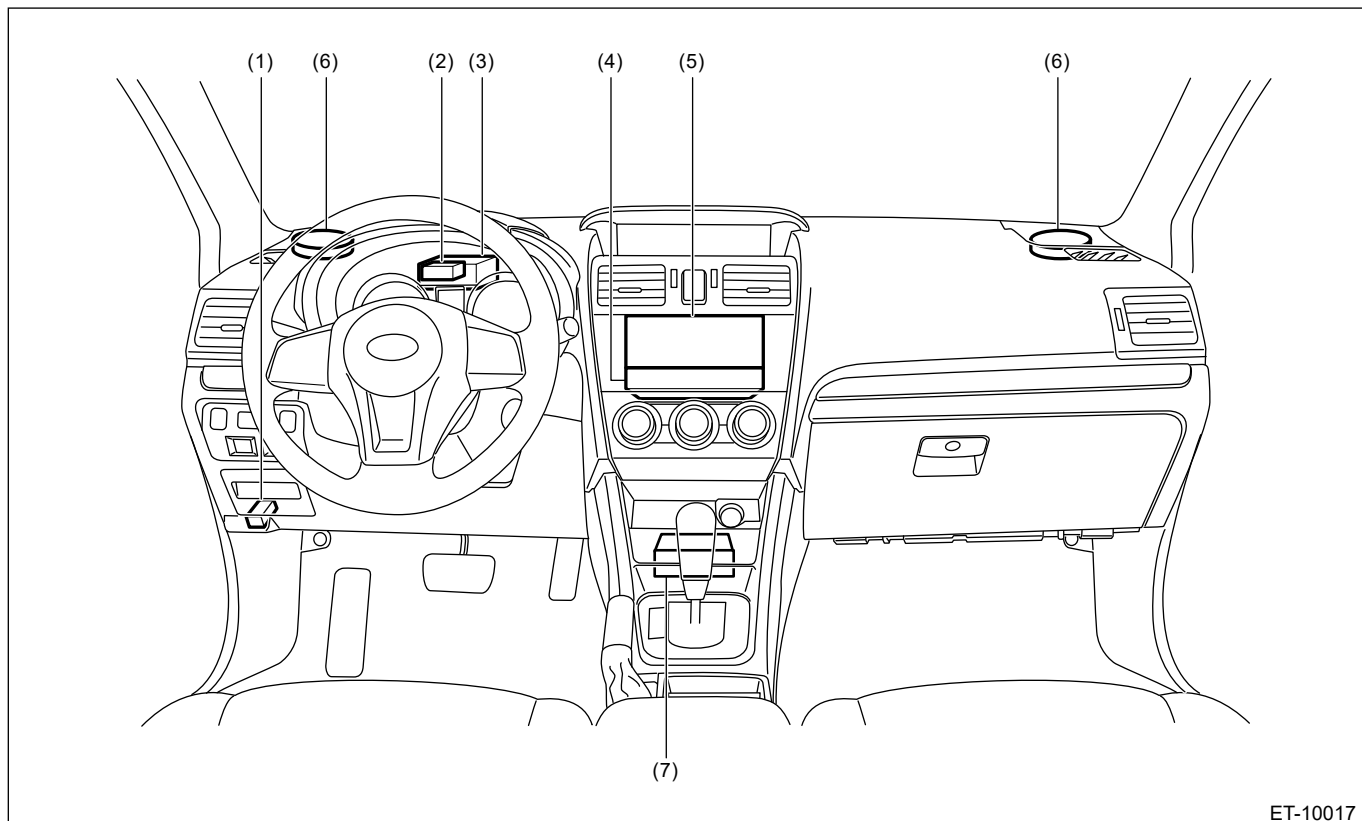
LIST

No.	Symptoms	Reference
1	The system does not notify the Telematics Service Provider Center automatically after collision.	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE SYSTEM DOES NOT NOTIFY THE TELEMATICS SERVICE PROVIDER CENTER AUTOMATICALLY AFTER COLLISION.
2	The system does not notify the center even if the SOS button is pressed.	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE SYSTEM DOES NOT NOTIFY THE CENTER EVEN IF THE SOS BUTTON IS PRESSED.
3	The system places an SOS call unintentionally during driving.	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE SYSTEM PLACES AN SOS CALL UNINTENTIONALLY DURING DRIVING.
4	The system places an I-CALL unintentionally during driving.	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE SYSTEM PLACES AN I-CALL UNINTENTIONALLY DURING DRIVING.
5	The system does not notify the center even if the I-button is pressed upon vehicle malfunction.	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE SYSTEM DOES NOT NOTIFY THE CENTER EVEN IF THE I-BUTTON IS PRESSED UPON VEHICLE MALFUNCTION.
6	Remote Vehicle Locator cannot locate the vehicle.	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > REMOTE VEHICLE LOCATOR CANNOT LOCATE THE VEHICLE.
7	Remote Vehicle Locator indicates an incorrect location for the vehicle.	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > REMOTE VEHICLE LOCATOR INDICATES AN INCORRECT LOCATION FOR THE VEHICLE.
8	Remote Door Lock does not lock the doors of the vehicle.	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > REMOTE DOOR

		LOCK DOES NOT LOCK THE DOORS OF THE VEHICLE.
9	The doors lock unintentionally.	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE DOORS LOCK UNINTENTIONALLY.
10	The doors unlock unintentionally.	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE DOORS UNLOCK UNINTENTIONALLY.
11	Remote Horn & HAZARD Lights do not operate upon request.	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > REMOTE HORN & HAZARD LIGHTS DO NOT OPERATE UPON REQUEST.
12	When the Vehicle Security Alarm is activated, notification is not sent.	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > WHEN THE VEHICLE SECURITY ALARM IS ACTIVATED, NOTIFICATION IS NOT SENT.
13	When a Malfunction indicator light/warning light is lit, notification is not sent.	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > WHEN A MALFUNCTION INDICATOR LIGHT/WARNING LIGHT IS LIT, NOTIFICATION IS NOT SENT.
14	Maintenance Notifications are not sent.	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > MAINTENANCE NOTIFICATIONS ARE NOT SENT.
15	The LED does not display the status. (LED malfunction)	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE LED DOES NOT DISPLAY THE STATUS. (LED MALFUNCTION).
16	Phone conversation is not possible. (The microphone does not respond to a voice. No sound is heard from the speaker.)	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > PHONE CONVERSATION IS NOT POSSIBLE. (THE MICROPHONE DOES NOT RESPOND TO A VOICE. NO SOUND IS HEARD FROM THE SPEAKER.).

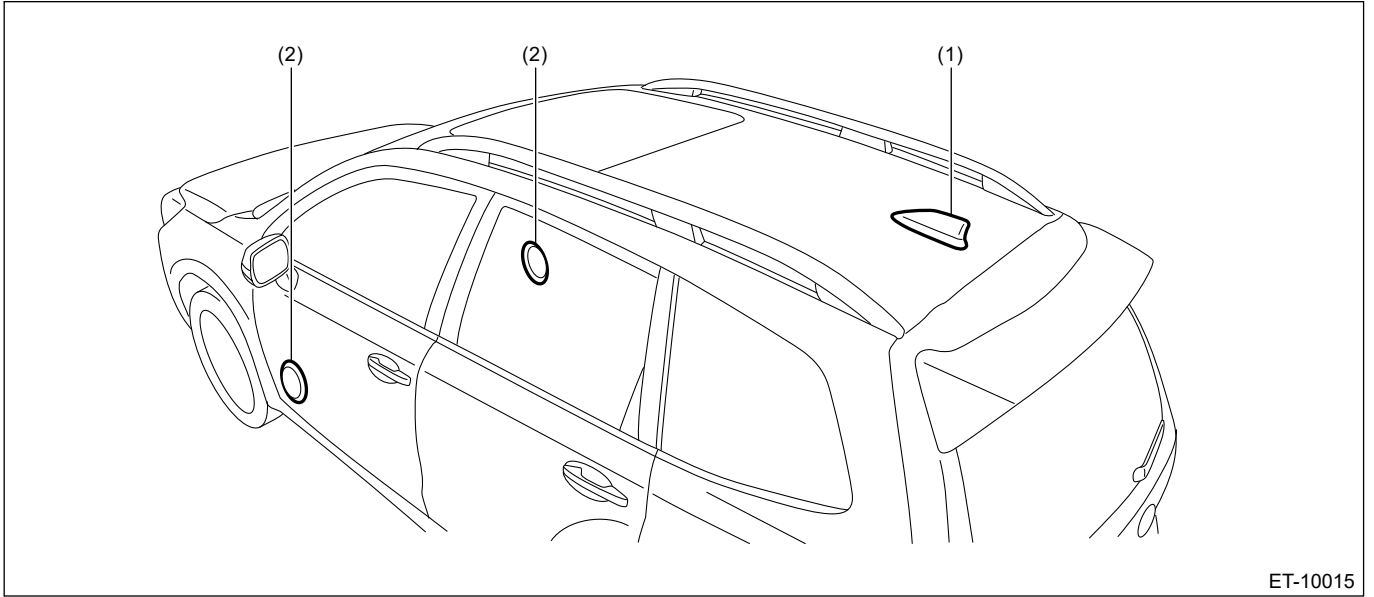
TELEMATICS SYSTEM (DIAGNOSTICS) > Electrical Component Location

LOCATION



ET-10017

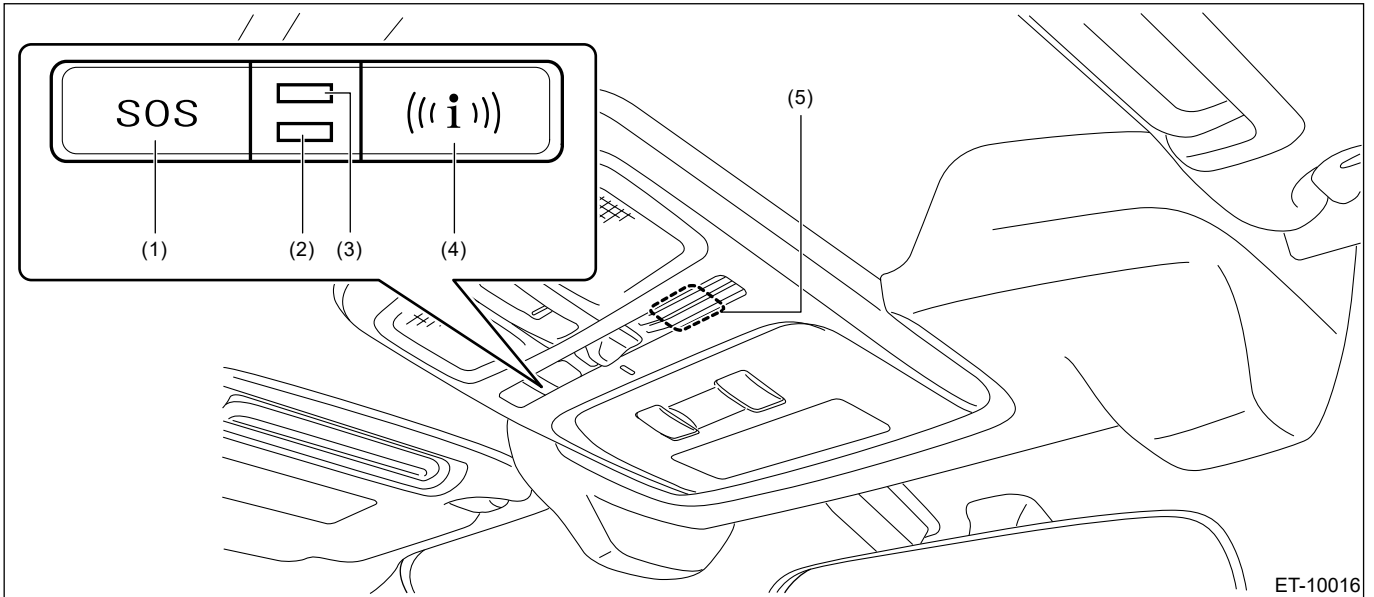
- | | | |
|----------------------------|-------------------------------------|--|
| (1) Data link connector | (4) Data communication module (DCM) | (6) Instrument panel speaker (standard and H/K specifications) |
| (2) GPS antenna | (5) Audio or navigation | (7) Airbag CM |
| (3) Telematics sub antenna | | |



ET-10015

(1) Telematics antenna

(2) Door speaker (standard specification)



ET-10016

(1) SOS button


(3) GREEN LED

(5) Microphone

(2) RED LED

(4) i-button

Note:

For the LED operation condition, refer to "LED operation condition" in "Check List for Interview".  Ref. to [TELEMATICS SYSTEM \(DIAGNOSTICS\)>Check List for Interview>CHECK > LED ILLUMINATION STATUS LIST.](#)

CAUTION

1. AIRBAG SYSTEM

Caution:





- **Do not use the electrical test equipment on all airbag harnesses and connector circuits.**
- **Be careful not to damage the airbag harness.**

TELEMATICS SYSTEM (DIAGNOSTICS) > General Description

INSPECTION

1. BASIC INSPECTION


Before performing the diagnosis, check the following items which may affect the problems relating to the telematics system.

- 1.** Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery>INSPECTION.](#)
 [Ref. to STARTING/CHARGING SYSTEMS\(H4DOTC\)>General Description.](#)
- 2.** Check the relay and fuse condition.  [Ref. to ENTERTAINMENT>Relay and Fuse.](#)  [Ref. to STARTING/CHARGING SYSTEMS\(H4DOTC\)>General Description.](#)
- 3.** Check the connecting condition of harness and harness connector.

TELEMATICS SYSTEM (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	— (Newly adopted tool)	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.










TELEMATICS SYSTEM (DIAGNOSTICS) > Inspection Mode


PROCEDURE

It is possible to diagnose the DTC by performing the indicated inspection mode.



After correcting the DTC, perform a necessary inspection mode and make sure that the function is resumed correctly and the DTC is recorded.

1. INSPECTION MODE 1

DTC	Item	Note
U0073	CONTROL MODULE COMMUNICATION BUS OFF	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0151	LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0151 LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0452	INVALID DATA RECEIVED FROM RESTRAINTS CONTROL MODULE	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic

		Trouble Code (DTC)>DTC U0452 INVALID DATA RECEIVED FROM RESTRAINTS CONTROL MODULE.
B2A00	VIN READING	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A00 VIN READING.
B2A01	LTE1 ANTENNA CIRCUIT	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A01 LTE1 ANTENNA CIRCUIT.
B2A02	LTE2 ANTENNA CIRCUIT	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A02 LTE2 ANTENNA CIRCUIT.
B2A03	GPS ANTENNA CIRCUIT	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A03 GPS ANTENNA CIRCUIT.
B2A07	BACKUP BATTERY CHARGE SYSTEM PERFORMANCE	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A07 BACKUP BATTERY CHARGE SYSTEM PERFORMANCE.
B2A08	SOS BUTTON CIRCUIT	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A08 SOS BUTTON CIRCUIT.
B2A09	I-CALL BUTTON CIRCUIT	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A09 I-CALL BUTTON CIRCUIT.
B2A0C	DCM PERFORMANCE	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0C DCM PERFORMANCE.
B2A0D	AIRBAG SIGNAL PERFORMANCE	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0D AIRBAG SIGNAL PERFORMANCE.
B2A0E	MUTE LINE CIRCUIT	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0E MUTE LINE CIRCUIT.
B2A0F	BACKUP BATTERY DEGRADATION	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0F BACKUP BATTERY DEGRADATION.
B2A10	DTC B2A10 BATTERY VOLTAGE HIGH	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A10 BATTERY VOLTAGE HIGH.

Inspection steps:

1. Clear the memory.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)
2. Read the DTC and check that the DTC is not displayed.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Note:






If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).

3. Turn the ignition switch to OFF.
4. Turn the ignition switch to ON, and wait for 5 seconds or more.
5. Read the DTC and check that the DTC is not displayed.



Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

2. INSPECTION MODE 2

DTC	Item	Note
B2A04	MIC CIRCUIT	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A04 MIC CIRCUIT.
B2A05	LEFT SPEAKER/AUDIO CIRCUIT	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A05 LEFT SPEAKER/AUDIO CIRCUIT.
B2A06	RIGHT SPEAKER/AUDIO CIRCUIT	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A06 RIGHT SPEAKER/AUDIO CIRCUIT.
B2A0A	RED LED CIRCUIT	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0A RED LED CIRCUIT.
B2A0B	GREEN LED CIRCUIT	 Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0B GREEN LED CIRCUIT.

Inspection steps:

1. Clear the memory.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Clear memory.](#)
2. Read the DTC and check that the DTC is not displayed.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).

3. Turn the ignition switch to OFF.
4. Close all doors. (The vehicle enters CAN sleep state.)
5. Wait for approx. 1 minute. After the indicator goes off, wait for another 1 minute. (DCM standby mode)
6. Turn the ignition switch to ON, and wait for 5 seconds or more.
7. Read the DTC and check that the DTC is not displayed.

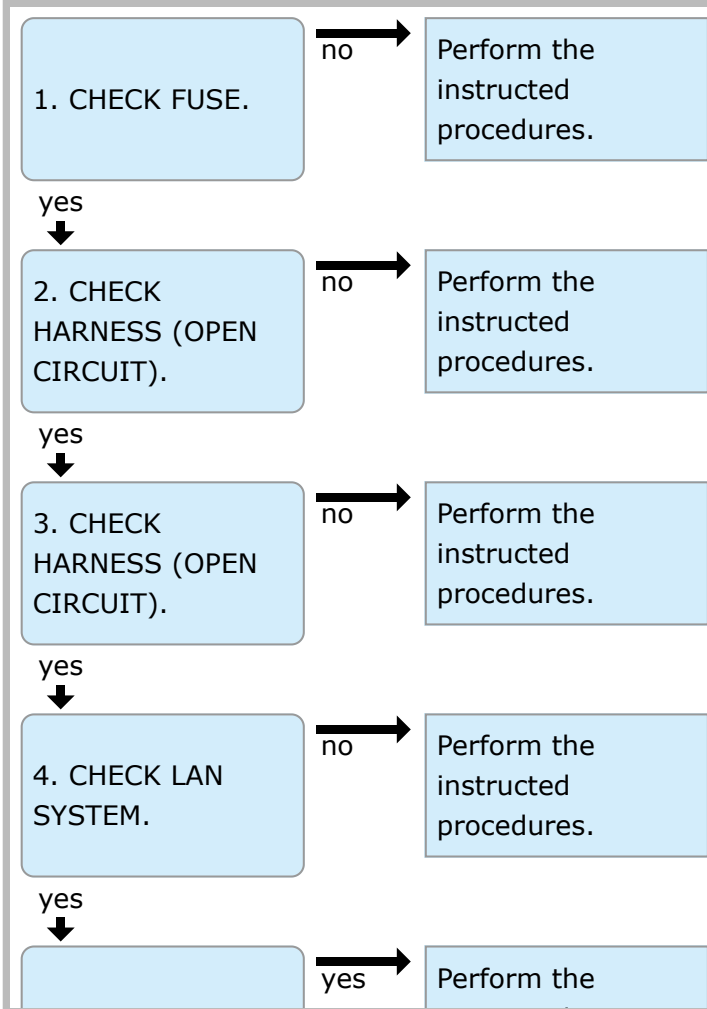
Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

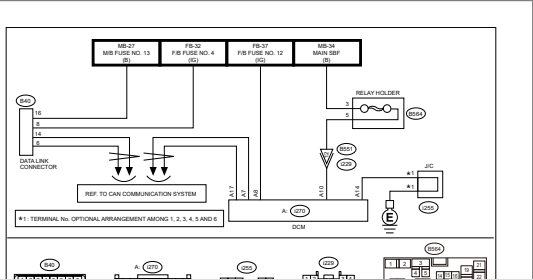
TELEMATICS SYSTEM (DIAGNOSTICS) > Subaru Select Monitor

INSPECTION

CAUTION/NOTE INTRO



Wiring diagram:
 Telematics [Ref. to WIRING SYSTEM>Tele System>WIRING DIAGRAM.](#)




Caution:
CommCheck is required after replacement.
[Ref. to ENTERTAINMENT>Tele System>OPERATION > REGISTRAT CHECK\).](#)

START

TELEMATICS SYSTEM (DIAGNOSTICS) > Subaru Select Monitor

OPERATION

- For detailed operation procedures, refer to "Application help".
- If the communication function of the Subaru Select Monitor cannot be executed properly, check the communication circuit.  [Ref. to TELEMATICS SYSTEM \(DIAGNOSTICS\)>Subaru Select Monitor>INSPECTION.](#)

PROCEDURE

Caution:

Remove foreign matter (dust, water, oil, etc.) from the TPMS & keyless entry CM connector or TPMS CM connector during removal and installation.

Note:

To check harness for open or short circuits, shake the suspected trouble spot or connector.

1. CHECK PRE-INSPECTION.

- 1. Check with the user regarding when the warning light lit or started blinking.
- 2. Before performing diagnostics, check all components which may adversely affect the tire pressure monitor system. [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>General Description>INSPECTION.](#)

Is the check result of the component that might affect the tire pressure monitor system OK?

Yes

[Go to 2.](#)

No

Repair or replace each component.

2. CHECK DIAGNOSTIC TROUBLE CODE (DTC).

- 1. Turn the ignition switch to OFF.
- 2. Connect the Subaru Select Monitor to data link connector.
- 3. Turn the ignition switch to ON and run the Subaru Select Monitor.

Note:

If the communication function of the Subaru Select Monitor cannot be executed normally, check the communication circuit. [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Subaru Select Monitor>INSPECTION.](#)

- 4. Read the DTC. [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?





Yes

[Go to 4.](#)

No

[Go to 3.](#)

3. PERFORM GENERAL DIAGNOSTICS.

1. Perform the inspection by referring to "General Diagnostic Table".  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>General Diagnostic Table.](#)
2. Perform the Clear Memory Mode.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Clear memory.](#)
3. Perform the Inspection Mode.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)


Check that the DTC is not displayed.

Does the tire pressure warning light illuminates for about 2 seconds and then foes off after turning on the ignition switch, and then go out?


Yes

Finish the diagnosis.

No

Check the tire inflation pressure warning light.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Tire Pressure Warning Light / Trouble Indicator Light Illumination Pattern.](#)

4. REPRODUCTION OF FAILURE.

1. Perform the drive test.
Drive the vehicle at 40 km/h (25 MPH) or faster for at least 10 minutes.
2. Read the DTC.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC displayed as current malfunction?

Yes

 [Go to 5.](#)



No

When DTC is displayed as "Past faults", the system has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, there may be temporary poor communication due to radio wave environment inside/outside the vehicle.

5. PERFORM DIAGNOSIS.

- 1.** Refer to "List of Diagnostic Trouble Code (DTC)".
- 2.** Correct the cause of trouble.
- 3.** Perform the Clear Memory Mode.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Clear memory.](#)
- 4.** Perform the drive test.
Drive the vehicle at 40 km/h (25 MPH) or faster for at least 10 minutes.
- 5.** Read the DTC.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?

Yes

Repeat steps 1 to 4 until DTC is not shown.

No

Finish the diagnosis.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Clear memory

OPERATION

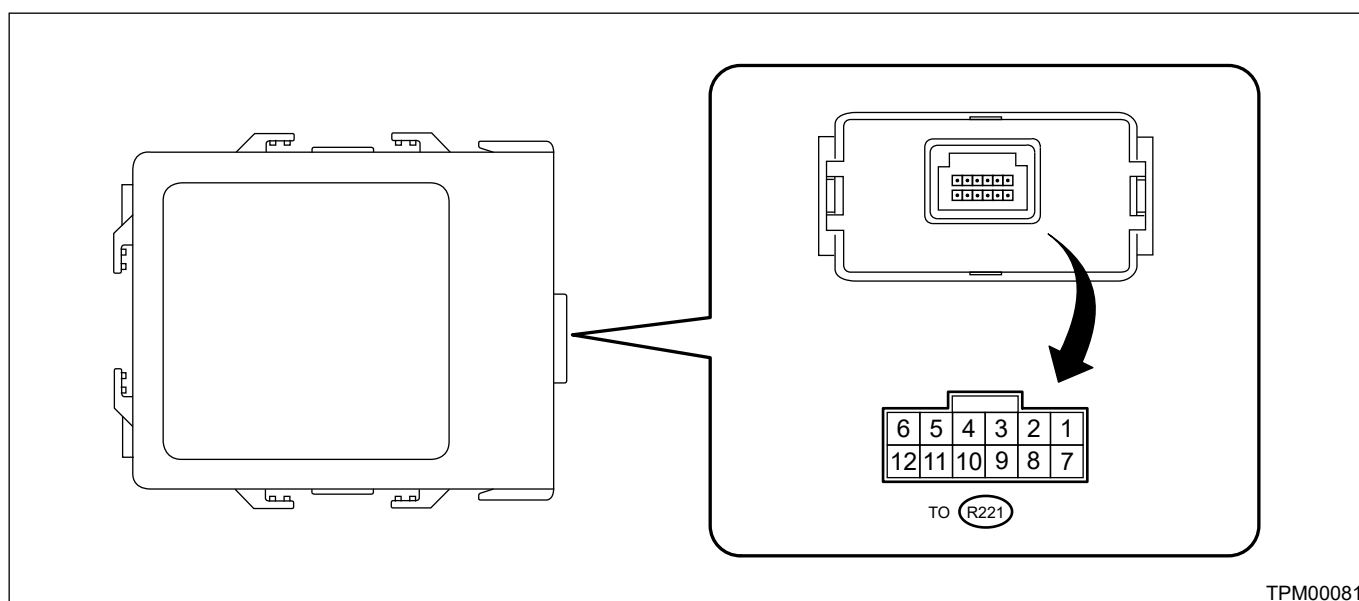
1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Tire Pressure Monitor], and then select [Enter].
5. On [Select Function] display, select [DTC].
6. On [DTC] display, select [Clear memory].

Note:

For detailed operation procedures, refer to “Application help”.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Control Module I/O Signal

ELECTRICAL SPECIFICATION



TPM00081

Terminal No.	Content	Measured value and measuring conditions	Remarks
1	—	—	—
2	—	—	—
3	—	—	—
4	Ignition power supply	10 — 13 V (when the ignition switch is ON)	—
5	GND	0 V (always)	—
6	Battery power supply	10 — 13 V (always)	Model without the keyless access with push button start
7	—	—	—
8	—	—	—
9	—	—	—
10	—	—	—
11	Body integrated unit	—	—
12	—	—	—

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Data Monitor

LIST

Display	Contents to be displayed	Unit of measure
Tire 1 FN code	LEARN•LOW BAT•OFF•WAKE•RE ME•NORMAL	LEARN: Transmitted transmitter ID using the transmitter registration tool LOW BAT: Transmitter battery voltage running low OFF: Transmitter function stops (no data transmission) RE ME: Tire air changes ± 8.4 kPa WAKE: When data transmission is started from a stopped state. NORMAL: Conditions other than above
Tire 2 FN code		
Tire 3 FN code		
Tire 4 FN code		
Tire 1 air pressure	Value converted to tire pressure from data delivered from transmitter is displayed. (The figure may differ from the actual measured values.)	kPa, psig, mmHg, inHg
Tire 2 air pressure		kPa, psig, mmHg, inHg
Tire 3 air pressure		kPa, psig, mmHg, inHg
Tire 4 air pressure		kPa, psig, mmHg, inHg
Vehicle Speed Sensor	Vehicle speed signal which is input in control module.	km/h, MPH
Pressure warning	Threshold where tire pressure warning light illuminates	kPa, psig, mmHg, inHg
Return pressure	Threshold where tire pressure warning light goes out	kPa, psig, mmHg, inHg
Transmitter power supply		ON MODE, OFF
INDICATOR LAMP	Status of tire pressure warning light	ON, OFF
Registered ID 1		0 – 16777215
Registered ID 2		0 – 16777215
Registered ID 3		0 – 16777215
Registered ID 4		0 – 16777215
Latest reception ID		0 – 16777215
Reception ID one ahead		0 – 16777215
Before reception ID2		0 – 16777215
Before reception ID3		0 – 16777215

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Data Monitor

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Tire Pressure Monitor], and then select [Enter].
5. On [Select Function] display, select [Data monitor].


Note:

For detailed operation procedures, refer to “Application help”.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2021 TIRE 1 AIR PRESSURE LOW (NORMAL MODE)


Note:

Refer to DTC C2024 for diagnostic procedure.  Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2024 TIRE 4 AIR PRESSURE LOW (NORMAL MODE).

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2022 TIRE 2 AIR PRESSURE LOW (NORMAL MODE)


Note:

Refer to DTC C2024 for diagnostic procedure.  Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2024 TIRE 4 AIR PRESSURE LOW (NORMAL MODE).

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2023 TIRE 3 AIR PRESSURE LOW (NORMAL MODE)

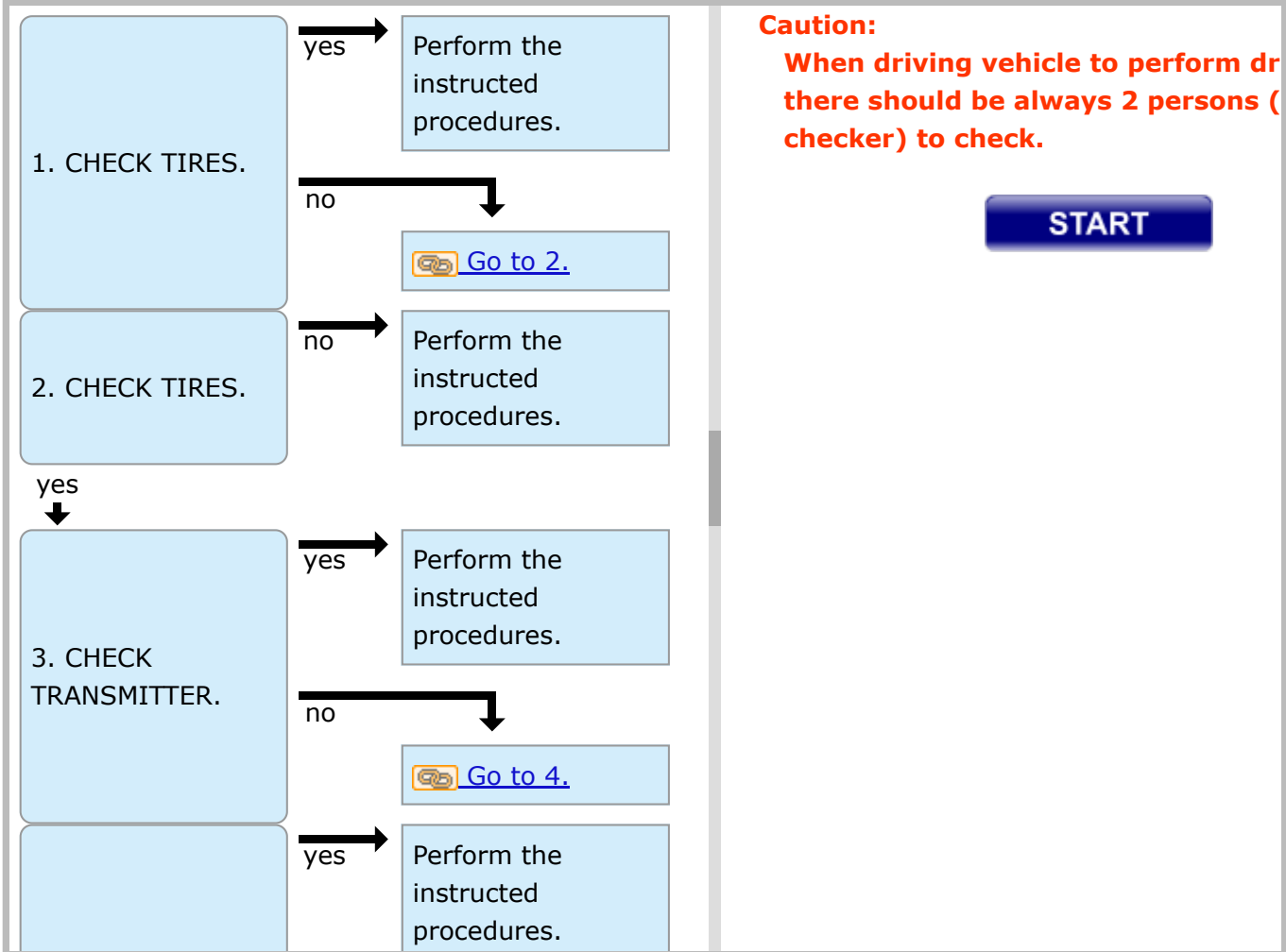
Note:

Refer to DTC C2024 for diagnostic procedure.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC C2024 TIRE 4 AIR PRESSURE LOW \(NORMAL MODE\).](#)

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2024 TIRE 4 AIR PRESSURE LOW (NORMAL MODE)


CAUTION/NOTE INTRO



TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2121 TRANSMITTER 1 NO DATA


Note:

Refer to DTC C2124 for diagnostic procedure.  Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2124 TRANSMITTER 4 NO DATA.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2122 TRANSMITTER 2 NO DATA


Note:

Refer to DTC C2124 for diagnostic procedure.  Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2124 TRANSMITTER 4 NO DATA.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2123 TRANSMITTER 3 NO DATA

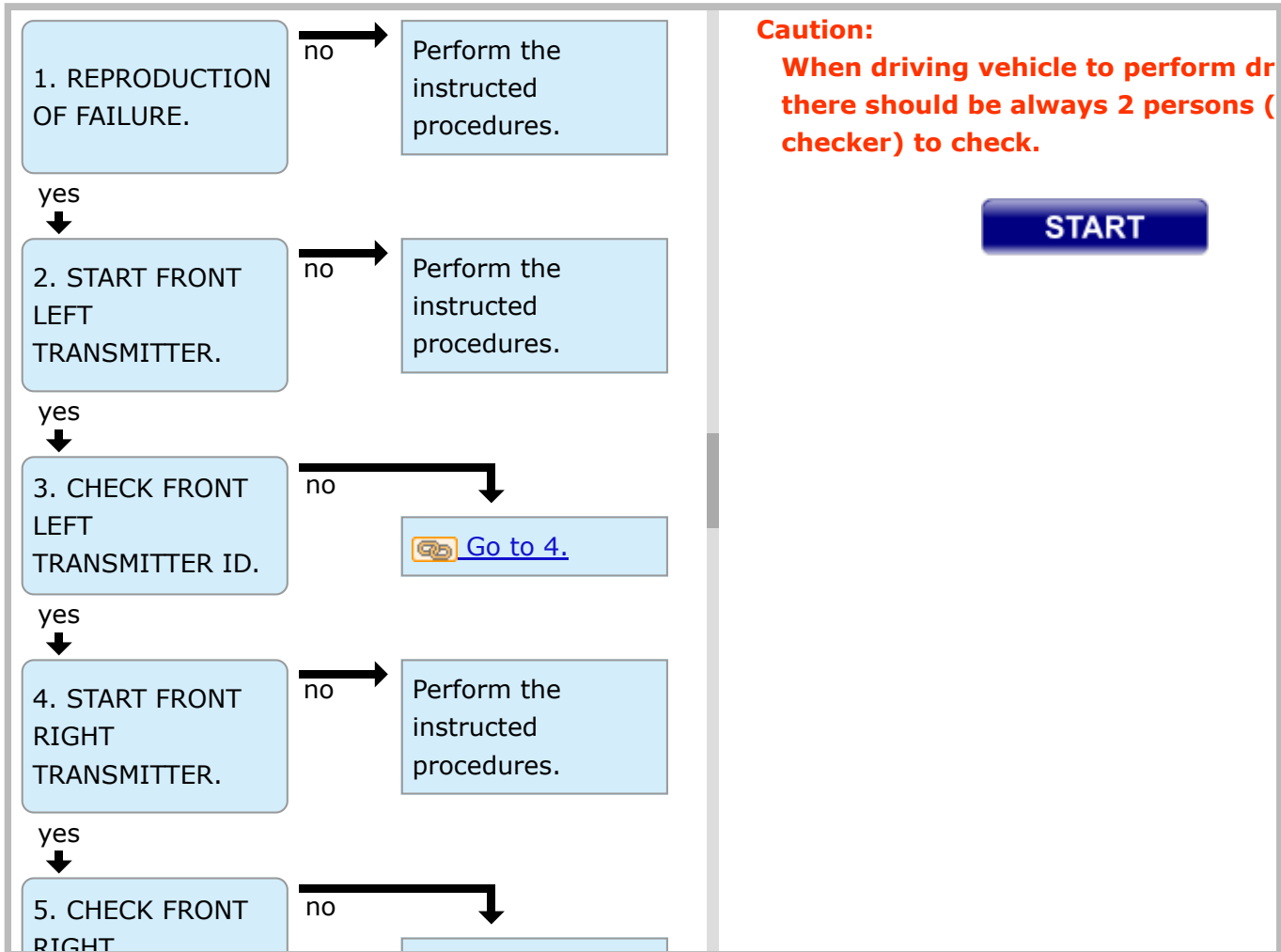
Note:

Refer to DTC C2124 for diagnostic procedure.  Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2124 TRANSMITTER 4 NO DATA.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2124 TRANSMITTER 4 NO DATA


CAUTION/NOTE INTRO



TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2221 TRANSMITTER 1 PRESSURE DATA ABNORMAL


Note:

Refer to DTC C2224 for diagnostic procedure.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC C2224 TRANSMITTER 4 PRESSURE DATA ABNORMAL.](#)

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2222 TRANSMITTER 2 PRESSURE DATA ABNORMAL


Note:

Refer to DTC C2224 for diagnostic procedure.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC C2224 TRANSMITTER 4 PRESSURE DATA ABNORMAL.](#)

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2223 TRANSMITTER 3 PRESSURE DATA ABNORMAL

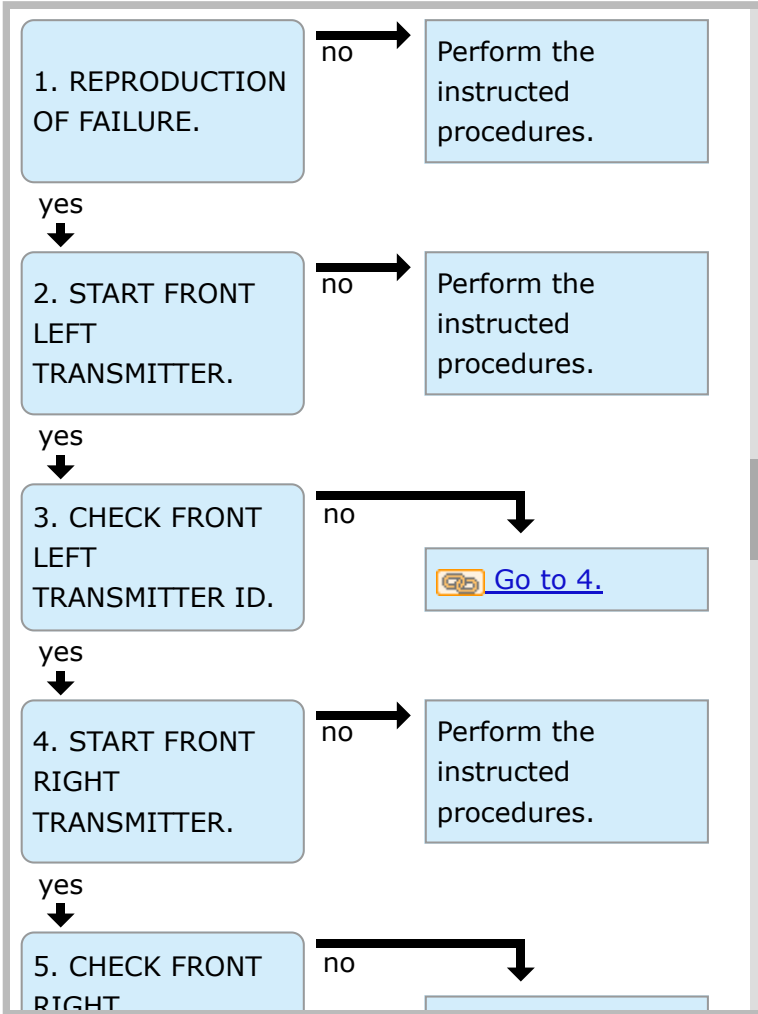
Note:

Refer to DTC C2224 for diagnostic procedure.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC C2224 TRANSMITTER 4 PRESSURE DATA ABNORMAL.](#)

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2224 TRANSMITTER 4 PRESSURE DATA ABNORMAL

CAUTION/NOTE INTRO




Caution:
When driving vehicle to perform dr there should be always 2 persons (checker) to check.

START

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2321 TRANSMITTER 1 FUNCTION CODE ABNORMAL


Note:

Refer to DTC C2324 for diagnostic procedure.  Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2324 TRANSMITTER 4 FUNCTION CODE ABNORMAL.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2322 TRANSMITTER 2 FUNCTION CODE ABNORMAL


Note:

Refer to DTC C2324 for diagnostic procedure.  Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2324 TRANSMITTER 4 FUNCTION CODE ABNORMAL.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2323 TRANSMITTER 3 FUNCTION CODE ABNORMAL

Note:

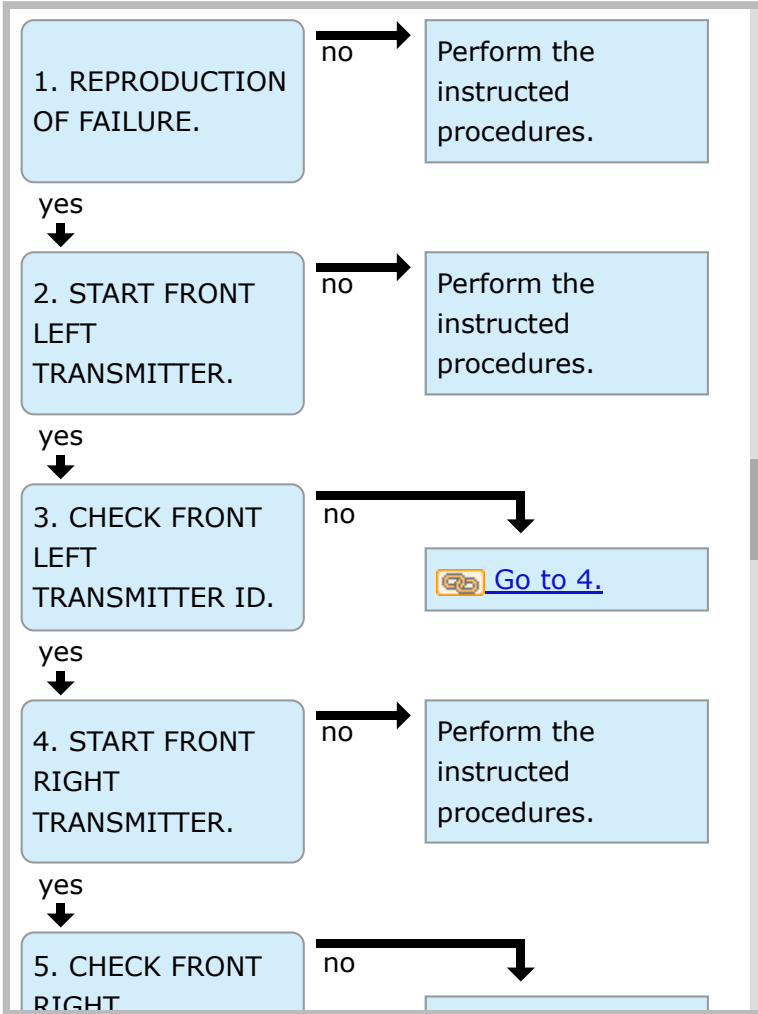
Refer to DTC C2324 for diagnostic procedure.  Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2324 TRANSMITTER 4 FUNCTION CODE ABNORMAL.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2324 TRANSMITTER 4 FUNCTION CODE ABNORMAL

CAUTION/NOTE

INTRO




Caution:
When driving vehicle to perform dr there should be always 2 persons (checker) to check.

START

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2421 TRANSMITTER 1 BATTERY VOLTAGE LOW


Note:

Refer to DTC C2424 for diagnostic procedure.  Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2424 TRANSMITTER 4 BATTERY VOLTAGE LOW.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2422 TRANSMITTER 2 BATTERY VOLTAGE LOW


Note:

Refer to DTC C2424 for diagnostic procedure.  Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2424 TRANSMITTER 4 BATTERY VOLTAGE LOW.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2423 TRANSMITTER 3 BATTERY VOLTAGE LOW

Note:

Refer to DTC C2424 for diagnostic procedure.  Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2424 TRANSMITTER 4 BATTERY VOLTAGE LOW.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2424 TRANSMITTER 4 BATTERY VOLTAGE LOW


DTC DETECTING CONDITION:

Low battery signals received 20 times from each transmitter.

Trouble symptom:


Tire pressure warning light blinks 25 times and then illuminates.

1. REPRODUCTION OF FAILURE.

1. Perform the drive test.
Drive the vehicle at 40 km/h (25 MPH) or faster for at least 10 minutes.
2. Read the DTC.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Is DTC displayed as current malfunction?

Yes

 [Go to 2.](#)


No

When DTC is displayed as "Past faults", the system has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, there may be temporary poor communication due to radio wave environment inside/outside the vehicle.

2. CHECK TRANSMITTER.


1. Replace all transmitters and register their IDs.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Register Transmitter \(ID\).](#)
2. Clear the memory and perform a driving test.

Is the fault eliminated?

Yes

Internal battery of the transmitter had worn out.

No

Replace the TPMS & keyless entry CM.  [Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.](#)

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2521 SPEED ABNORMAL

DTC DETECTING CONDITION:

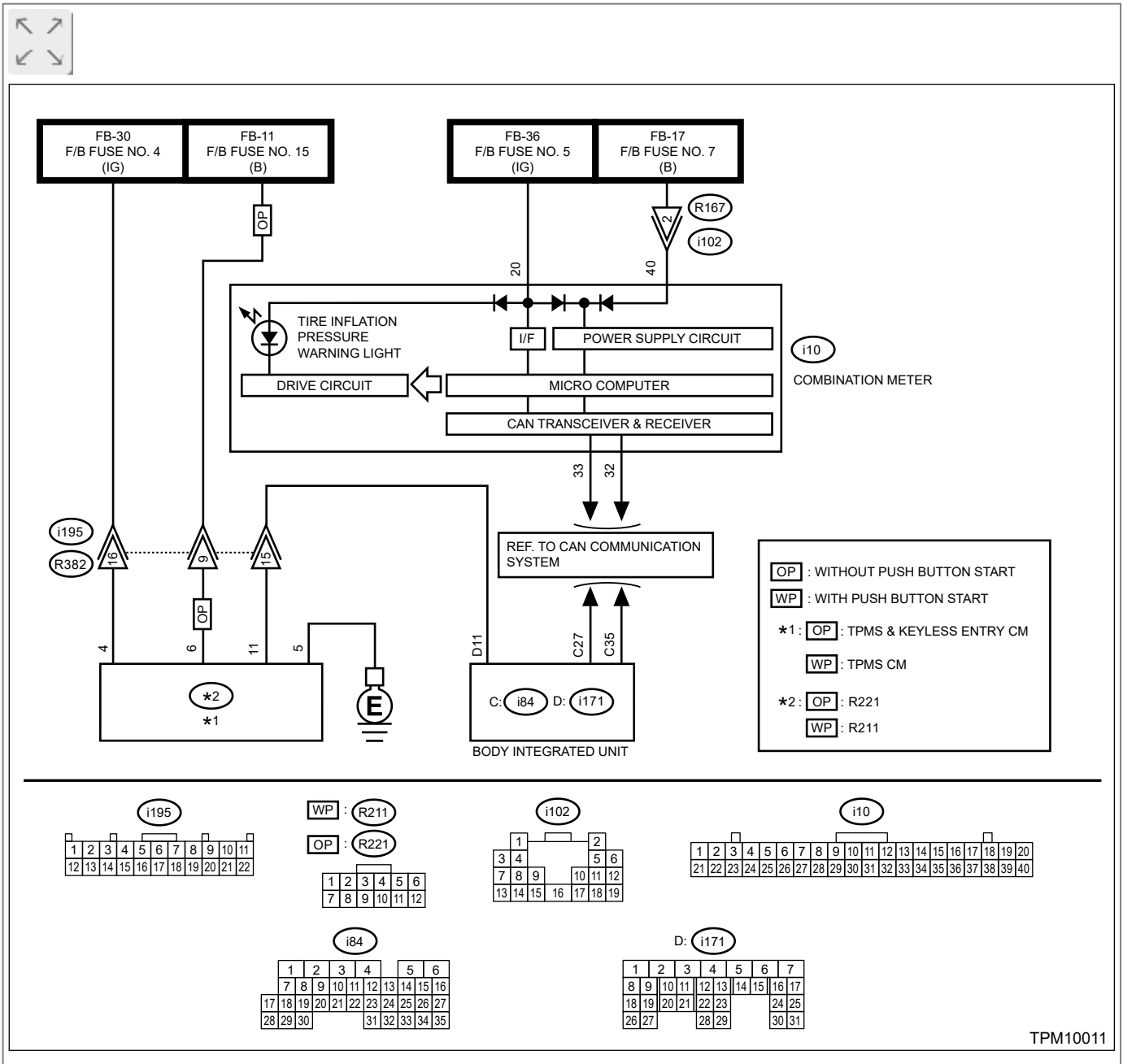
Vehicle speed function codes were received from the transmitter, but the vehicle speed signal was not input to the module.

Trouble symptom:

Tire pressure warning light blinks 25 times and then illuminates.

Wiring diagram:

Tire Pressure Monitoring System  [Ref. to WIRING SYSTEM>Tire Pressure Monitoring System>WIRING DIAGRAM.](#)



1. CHECK LAN COMMUNICATION.

Inspect LAN system. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

Is the check result OK?

Yes

[Go to 2.](#)

No

Repair it according to the diagnosis for LAN system.

2. CHECK HARNESS.

Measure the resistance between TPMS CM or TPMS & keyless entry CM and body integrated unit.

Connector & terminal

Without push button start

(R221) No. 11 – (i171) No. 11:

With push button start

(R211) No. 11 – (i171) No. 11:

Is the resistance less than 10 Ω ?

Yes

[Go to 3.](#)

No

Repair the harness.

3. CHECK CONNECTOR.

Check each connector.

Is there poor contact or any other faults?

Yes

Repair the connector.

No



Replace the TPMS CM or TPMS & keyless entry CM. [Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System>REMOVAL.](#)

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

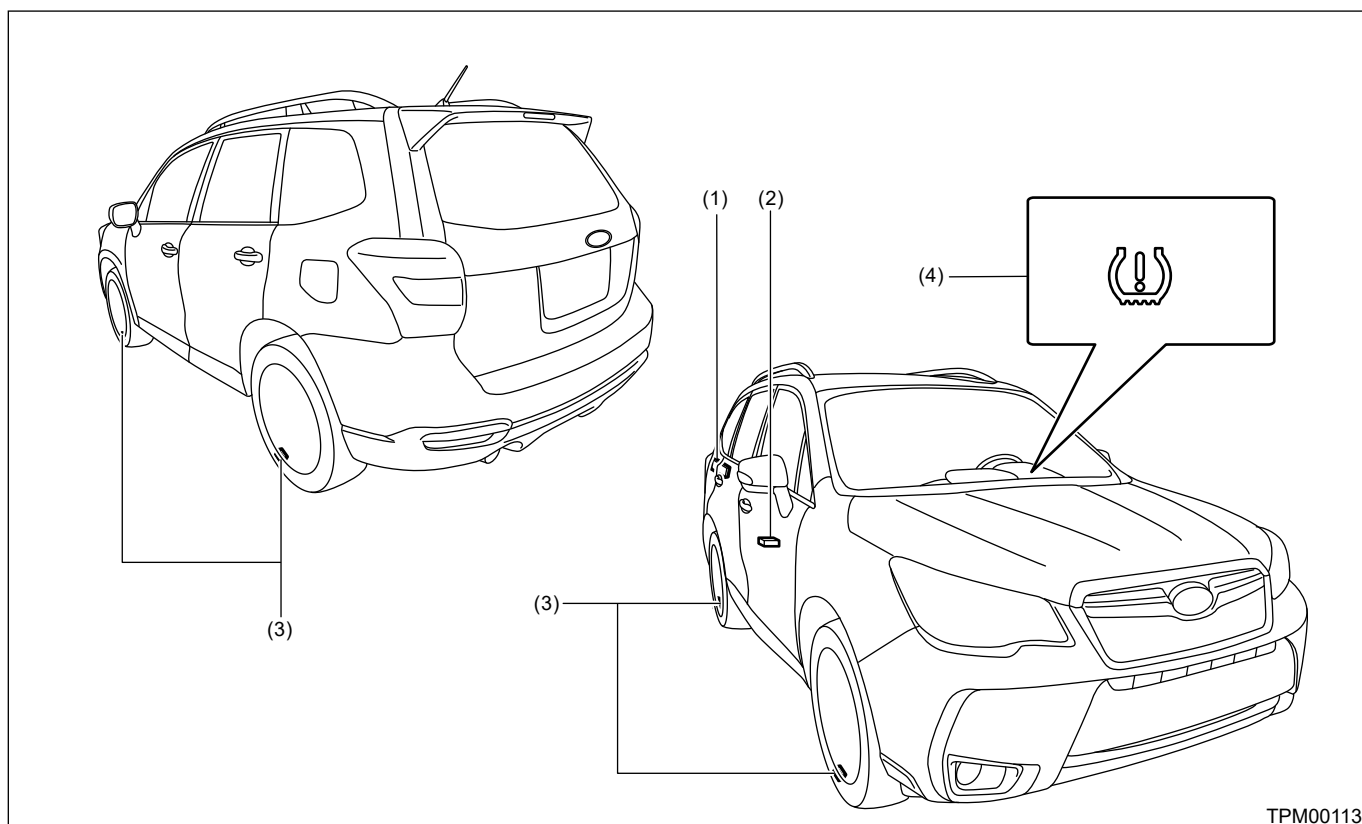
1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Tire Pressure Monitor], and then select [Enter].
5. On [Select Function] display, select [DTC].

Note:

- For detailed operation procedures, refer to “Application help”.
- For details concerning DTCs, refer to [List of Diagnostic Trouble Code \(DTC\)](#). 
[Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\)](#).
- All DTCs detected will be displayed.
- If a particular DTC is not properly stored in memory (due to a voltage drop of the TPMS & keyless entry CM or TPMS CM power supply, etc.) when a problem occurs, a DTC suffixed with a question mark appears on the Subaru Select Monitor display. This shows it may be an unreliable reading.
- When DTC is not displayed, check the indicator circuit and communication circuit.
 [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Tire Pressure Warning Light / Trouble Indicator Light Illumination Pattern](#).

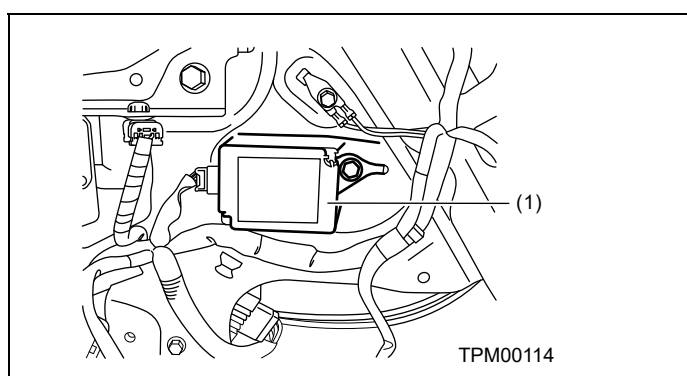
TIRE PRESSURE MONITOR(DIAGNOSTICS) > Electrical Component Location

LOCATION

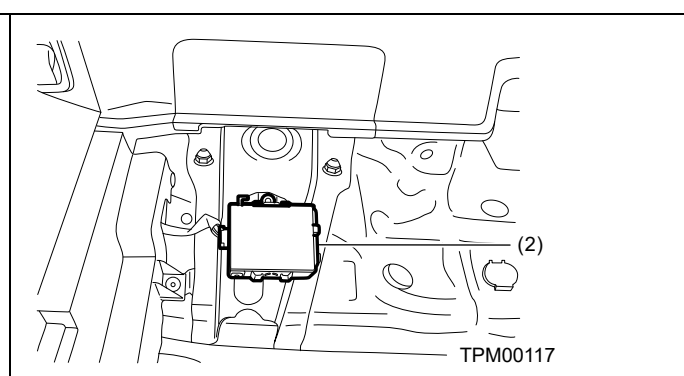


TPM00113

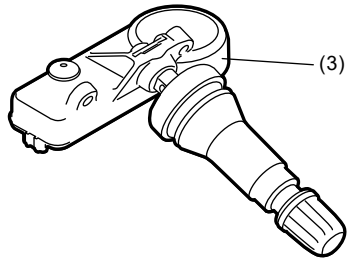
- (1) TPMS & keyless entry CM (model with keyless entry)
- (2) TPMS CM (model with keyless access)
- (3) Snap-in type transmitter
- (4) Tire pressure warning light



TPM00114



TPM00117



TPM00049

TIRE PRESSURE MONITOR(DIAGNOSTICS) > General Description

CAUTION


1. SRS AIRBAG SYSTEM

The airbag system wiring harness is routed near the TPMS CM or the TPMS & keyless entry CM connector.

Caution:

- Do not use electrical test equipment on any of the airbag system wiring harness circuits.
- Be careful not to damage the wiring harness of the airbag system, when servicing the TPMS CM or TPMS & keyless entry CM.

2. TPMS CM OR TPMS & KEYLESS ENTRY CM

- If the transmitter is replaced, ID registration for the transmitter is required.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Register Transmitter \(ID\)>OPERATION.](#)
- When adjusting tire pressure indoors in winter, there is a big temperature difference between the indoor facilities and outside. Once the car is outside where the temperature is lower, the air pressure in the tires will drop, causing the tire pressure warning light to illuminate, even if the pressure in the tires was adjusted to standard values indoors. To avoid this, it is necessary to adjust the tire pressure to the high side in consideration of the difference in temperature between inside and outside according to the following table.
- P225/55R18 (turbo model)

Temperature °C (°F)	Indoor temperature	15.5 (60)		
	Ambient air temperature	-1 (30)	-12 (10)	-23 (-10)
Air pressure kPa (psi)	Front	250 (36)	260 (38)	275 (40)
	Rear	240 (35)	255 (37)	270 (39)

- P225/55R18 (non-turbo model)

Temperature °C (°F)	Indoor temperature	15.5 (60)		
	Ambient air temperature	-1 (30)	-12 (10)	-23 (-10)

Air pressur e kPa (psi)	Front	240 (35)	255 (37)	270 (39)
	Rear	230 (33)	240 (35)	255 (37)

- P225/60R17

Tempe rature °C (°F)	Indoor temper ature	15.5 (60)		
	Ambie nt air temper ature	-1 (30)	-12 (10)	-23 (-10)
Air pressur e kPa (psi)	Front	230 (33)	240 (35)	255 (37)
	Rear	220 (32)	235 (34)	250 (36)

TIRE PRESSURE MONITOR(DIAGNOSTICS) > General Description



INSPECTION

Before performing diagnosis, check the following item which might affect the quality of the tire pressure monitoring system.

1. TIRES

- Inspect that the tire pressure is within the specification while the tire is cool. (Refer to Tire Caution Label.)
- Check the tires for damage or the insertion of foreign matters.


2. BATTERY

Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DQ\)>Battery.](#)  [Ref. to STARTING/CHARGING SYSTEMS\(H4DOTC\)>General Description.](#)

TIRE PRESSURE MONITOR(DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>STSSM4</p>	<p>— (Newly adopted tool)</p>	<p>SUBARU SELECT MONITOR 4</p>	<p>Used for setting of each function and troubleshooting for electrical system.</p> <p>Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".</p>

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Transmitter registration tool	Used to register the transmitter ID. Manufacturer: Kent-Moore Item number: J45295
DST-i	Used together with Subaru Select Monitor 4.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > General Diagnostic Table

INSPECTION

Symptoms		Faulty parts
Tire pressure warning light illuminates.	Tire pressure is reduced.	<ul style="list-style-type: none"> • Improper tire pressure adjustment • Punctured tire
Tire pressure warning light blinks 25 times and then illuminates.	Tire pressure monitoring system has malfunction.	<ul style="list-style-type: none"> • Air pressure sensor malfunction • Air pressure sensor is out of battery. • Defective TPMS CM or TPMS & keyless entry CM • Defective vehicle harness • Defective combination meter
Tire pressure is dropping but the warning light does not illuminate.	Tire pressure warning light does not illuminate.	<ul style="list-style-type: none"> • Air pressure sensor malfunction • Defective TPMS CM or TPMS & keyless entry CM • Defective combination meter







TIRE PRESSURE MONITOR(DIAGNOSTICS) > Inspection Mode








PROCEDURE








Reproduce the malfunction occurrence condition as much as possible. Drive the vehicle at 40 km/h (25 MPH) or faster for at least ten minutes.


TIRE PRESSURE MONITOR(DIAGNOSTICS) > List of Diagnostic Trouble Code (DTC)

LIST

DTC	Item	Contents of diagnosis	Note
C2021	TIRE 1 AIR PRESSURE LOW (NORMAL MODE)	Tire pressure of tire 1 is reduced.	 Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2021 TIRE 1 AIR PRESSURE LOW (NORMAL MODE) .
C2022	TIRE 2 AIR PRESSURE LOW (NORMAL MODE)	Tire pressure of tire 2 is reduced.	 Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2022 TIRE 2 AIR PRESSURE LOW (NORMAL MODE) .
C2023	TIRE 3 AIR PRESSURE LOW (NORMAL MODE)	Tire pressure of tire 3 is reduced.	 Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2023 TIRE 3 AIR PRESSURE LOW (NORMAL MODE) .
C2024	TIRE 4 AIR PRESSURE LOW (NORMAL MODE)	Tire pressure of tire 4 is reduced.	 Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2024 TIRE 4 AIR PRESSURE LOW (NORMAL MODE) .
C2121	TRANSMITTER 1 NO DATA	Data cannot be received from transmitter 1.	 Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2121 TRANSMITTER 1 NO DATA .
C2122	TRANSMITTER 2 NO DATA	Data cannot be received from transmitter 2.	 Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2122 TRANSMITTER 2 NO DATA .

C212 3	TRANSMITTER 3 NO DATA	Data cannot be received from transmitter 3.	 Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2123 TRANSMITTER 3 NO DATA.
C212 4	TRANSMITTER 4 NO DATA	Data cannot be received from transmitter 4.	 Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2124 TRANSMITTER 4 NO DATA.
C222 1	TRANSMITTER 1 PRESSURE DATA ABNORMAL	Transmitter 1 data contents are abnormal.	 Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2221 TRANSMITTER 1 PRESSURE DATA ABNORMAL.
C222 2	TRANSMITTER 2 PRESSURE DATA ABNORMAL	Transmitter 2 data contents are abnormal.	 Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2222 TRANSMITTER 2 PRESSURE DATA ABNORMAL.
C222 3	TRANSMITTER 3 PRESSURE DATA ABNORMAL	Transmitter 3 data contents are abnormal.	 Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2223 TRANSMITTER 3 PRESSURE DATA ABNORMAL.
C222 4	TRANSMITTER 4 PRESSURE DATA ABNORMAL	Transmitter 4 data contents are abnormal.	 Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2224 TRANSMITTER 4 PRESSURE DATA ABNORMAL.
C232 1	TRANSMITTER 1 FUNCTION CODE ABNORMAL	Function code has error.	 Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2321

			TRANSMITTER 1 FUNCTION CODE ABNORMAL.
C232 2	TRANSMITTER 2 FUNCTION CODE ABNORMAL	Function code has error.	 Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2322 TRANSMITTER 2 FUNCTION CODE ABNORMAL.
C232 3	TRANSMITTER 3 FUNCTION CODE ABNORMAL	Function code has error.	 Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2323 TRANSMITTER 3 FUNCTION CODE ABNORMAL.
C232 4	TRANSMITTER 4 FUNCTION CODE ABNORMAL	Function code has error.	 Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2324 TRANSMITTER 4 FUNCTION CODE ABNORMAL.
C242 1	TRANSMITTER 1 BATTERY VOLTAGE LOW	Transmitter battery voltage is low.	 Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2421 TRANSMITTER 1 BATTERY VOLTAGE LOW.
C242 2	TRANSMITTER 2 BATTERY VOLTAGE LOW	Transmitter battery voltage is low.	 Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2422 TRANSMITTER 2 BATTERY VOLTAGE LOW.
C242 3	TRANSMITTER 3 BATTERY VOLTAGE LOW	Transmitter battery voltage is low.	 Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2423 TRANSMITTER 3 BATTERY VOLTAGE LOW.
C242	TRANSMITTER 4 BATTERY	Transmitter battery voltage is	 Ref. to TIRE PRESSURE

4	VOLTAGE LOW	low.	MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2424 TRANSMITTER 4 BATTERY VOLTAGE LOW.
C252 1	SPEED ABNORMAL	Vehicle speed signal is not input to the control module when the vehicle speed is 6 km/h (3.7 MPH) or more.	 Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2521 SPEED ABNORMAL.


TIRE PRESSURE MONITOR(DIAGNOSTICS) > Register Transmitter (ID)

OPERATION

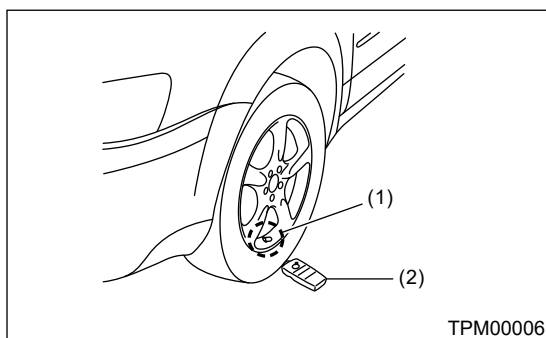
Perform the registration procedure of the transmitter in the following cases:

- Transmitter is replaced.
- TPMS CM or TPMS & keyless entry CM is replaced.

Note:

- **If registration of the transmitter ID is not possible after two attempts, replace the TPMS CM or TPMS & keyless entry CM.  [Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.](#)**
- **During the registration, turn the ignition switch to OFF and end the Subaru Select Monitor. Or if the registration is not performed for 5 minutes or more, the registration mode is cancelled.**
- **When rotating tires, there is no affect on the performance or functions of the tire pressure monitoring control module even if the transmitter (ID) is not registered, however, the tire position displayed on the Subaru Select Monitor will be incorrect.**

1. Adjust all tire pressures to the specifications.
2. Connect the Subaru Select Monitor and select [Diagnosis] on [Start] display.
3. On [Vehicle selection] display, input the target vehicle information and select [OK].
4. On [Main Menu] display, select [Each System].
5. On [Select System] display, select [Tire Pressure Monitor], and then select [Enter].
6. On [Select Function] display, select [Work Support].
7. On [Work Support] display, select [Transmitter ID regist].
8. When [ID registration mode When execute Registered ID is deleted Continue?] is displayed, select [OK].
9. Contact the transmitter registration tool to the side wall area near the air valve on the front left tire, and press the switch. The transmitter ID is sent to the TPMS CM or TPMS & keyless entry CM. (At this time, the tire pressure warning light blinks to confirm that the registration has started.)





- (1) Air valve (transmitter)
- (2) Transmitter registration tool

Note:

- **The registration order of transmitter ID is not specified.**

- **The transmitter registration tool is used by touching the side wall area near the transmitter.**
- **When registration of each tire is completed, [ID registration completed] is displayed on the Select Monitor screen.**
- **If registration procedure stop in the halfway (turning ignition switch to OFF, wrong registration order, etc), proceed from step 5).**

- 10.** When ID registration is completed, the tire pressure warning light remains lit for approximately 2 seconds, to end the registration. Switch the screen to [Data Monitor] of Subaru Select Monitor.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Data Monitor.](#)
- 11.** Check the transmitter ID that was registered, then perform a driving test.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Inspection Mode.](#)

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Subaru Select Monitor

INSPECTION

Detecting condition:

Defective harness connector

Trouble symptom:


Communication is impossible between the TPMS CM or TPMS & keyless entry CM and the Subaru Select Monitor.

1. CHECK IGNITION SWITCH.



Is the ignition switch ON?

Yes

 [Go to 2.](#)

No

Turn the ignition switch to ON, and select the [Tire Pressure Monitor] using the Subaru Select Monitor.


2. CHECK BATTERY.



Check the battery voltage.

Is the voltage 11 V or more?

Yes

 [Go to 3.](#)

No

Charge or replace the battery.

3. CHECK BATTERY TERMINAL.




Check the battery terminal.

Is the check result OK?

Yes

Replace or tighten the battery terminal.

No

 [Go to 4.](#)

4. CHECK SUBARU SELECT MONITOR COMMUNICATION.


1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check whether communication to other systems can be executed normally.

Is communication for initializing with other systems possible?

Yes

 [Go to 6.](#)

No


 [Go to 5.](#)

5. CHECK SUBARU SELECT MONITOR COMMUNICATION.

Connect the Subaru Select Monitor to another vehicle.

Is the communication for initializing with the connected vehicle possible?

Yes

Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No


Replace or repair the Subaru Select Monitor.

6. CHECK BODY INTEGRATED UNIT COMMUNICATION.


1. Connect the Subaru Select Monitor to the target vehicle.
2. On [Each System] display, select [Body Control].

Is communication for initializing possible?

Yes

Perform the diagnosis for DTC U1500.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC U1500 KEYLESS UART COM. MALFUNCTION.](#)

No

Perform the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Subaru Select Monitor

OPERATION

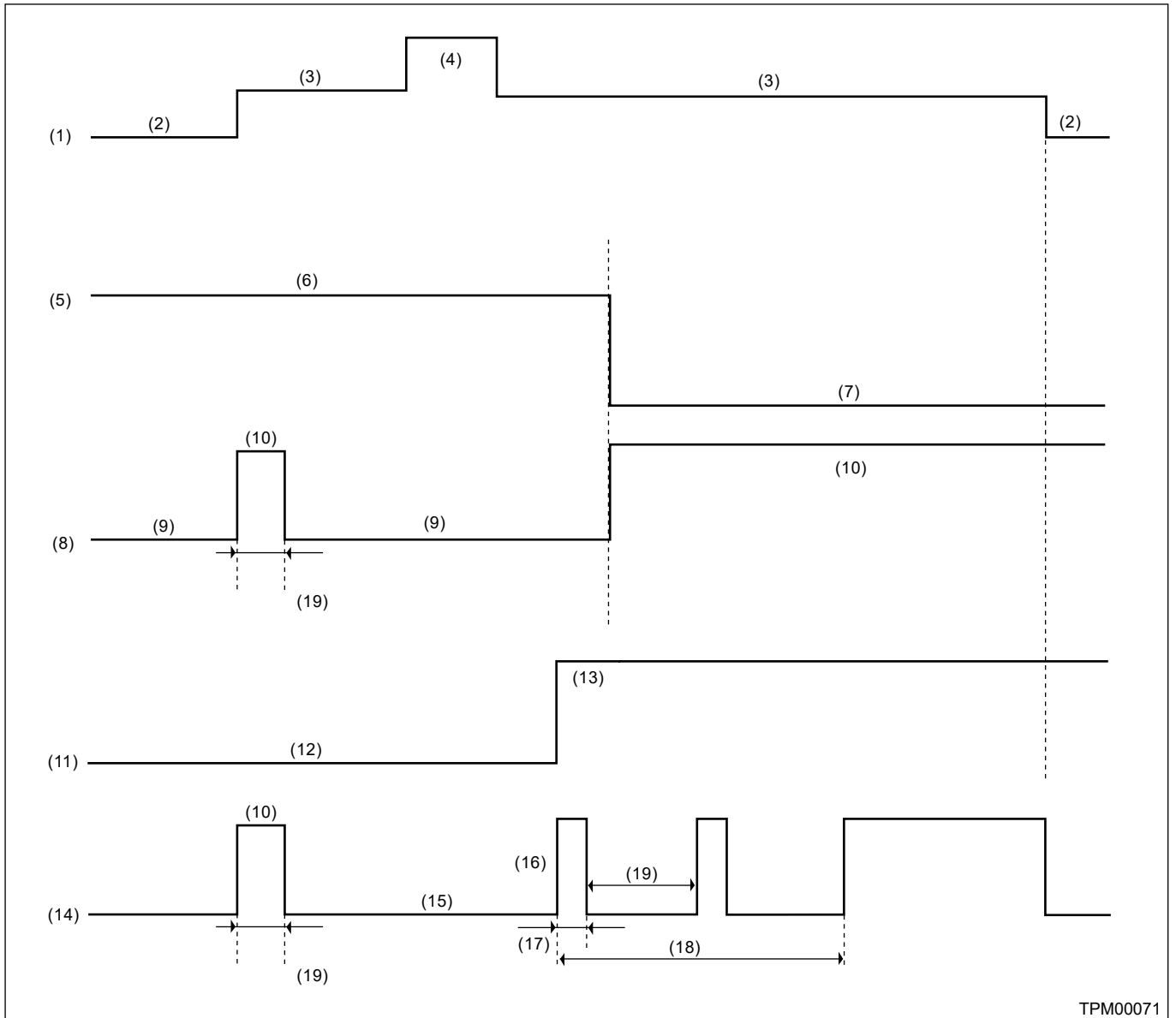
For detailed operation procedures, refer to "Application help".

Note:

If TPMS CM or TPMS & keyless entry CM cannot communicate with Subaru Select Monitor, check the communication circuit.  Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Subaru Select Monitor>INSPECTION.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Tire Pressure Warning Light / Trouble Indicator Light Illumination Pattern


INSPECTION




TPM00071

- | | | |
|---------------------------------------|--|----------------------|
| (1) Ignition switch | (8) Tire inflation pressure warning light (pressure condition) | (15) Light OFF |
| (2) OFF | (9) Light OFF | (16) Blink |
| (3) ON | (10) Light ON | (17) 1 second |
| (4) Start | (11) System status | (18) Blinks 25 times |
| (5) Tire inflation pressure condition | (12) Normal | (19) 2 seconds |
| (6) Meet the specification | (13) Malfunction | |
| (7) Less than standard value | (14) Tire inflation pressure warning light (system condition) | |

(For the pressure warning level, refer to "Data monitor".

 [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Data Monitor.](#))

- 1.** When the tire pressure warning light does not illuminate in accordance with this illumination pattern, there must be an electrical malfunction.
- 2.** If the tire pressure warning light does not go off, check the TPMS CM or TPMS & keyless entry CM / warning light circuit, and the combination meter circuit.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Tire Pressure Warning Light / Trouble Indicator Light Illumination Pattern>TIRE PRESSURE WARNING LIGHT DOES NOT COME OFF.](#)

Note:

If the problem is fixed while driving at approximately 40 km/h (25 MPH) after the tire pressure warning light blinks/lights, the warning light goes out and the tire pressure monitor system operates normally. (If there is a decrease in tire pressure, or a malfunction of the system, the malfunction history is displayed.)

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Tire Pressure Warning Light / Trouble Indicator Light Illumination Pattern

TIRE PRESSURE WARNING LIGHT DOES NOT COME OFF


Detecting condition:

- Defective combination meter
- Tires pressure drop
- Transmitter ID not registered

Trouble symptom:


Tire pressure warning light remains illuminating after engine starts.

1. CHECK DTC.


Connect the Subaru Select Monitor, and read the DTC.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?


Yes

Perform the diagnosis for the displayed DTCs.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


 [Go to 2.](#)

2. CHECK TRANSMITTER (ID).

Display the transmitter ID of the tire pressure monitor system.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Data Monitor.](#)

Is the transmitter ID registered?


Yes

 [Go to 3.](#)

No


Register the transmitter ID.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Register Transmitter \(ID\)>OPERATION.](#)

3. CHECK TRANSMITTER DATA OUTPUT.


1. Select Data monitor of the tire pressure monitor.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Data Monitor.](#)
2. Start the engine and check the tire pressure warning light output.

Is the warning light output ON?

Yes

Replace the TPMS CM or TPMS & keyless entry CM.  [Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System>REMOVAL.](#)

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter>REMOVAL.](#)

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Tire Pressure Warning Light / Trouble Indicator Light Illumination Pattern

TIRE PRESSURE WARNING LIGHT DOES NOT COME ON


Detecting condition:

Defective combination meter

Trouble symptom:


When the ignition switch is turned to ON, the tire pressure warning light does not turn on (for approx. 2 seconds).

1. CHECK DTC.

Connect the Subaru Select Monitor, and read the DTC.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?


Yes

Perform the diagnosis for the displayed DTCs.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


 [Go to 2.](#)

2. CHECK COMBINATION METER.


Perform the active test [TPMS warning] of combination meter.  [Ref. to COMBINATION METER \(DIAGNOSTICS\)>Active Test.](#)

Does the tire pressure warning light illuminate?

Yes

Replace the TPMS & keyless entry CM or TPMS CM.  [Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.](#)

No

Replace the combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.](#)

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Tire Pressure Warning Light / Trouble Indicator Light Illumination Pattern

TIRE PRESSURE WARNING LIGHT IS 25 TIMES BLINKING AND TURN ON


Detecting condition:

- Defective TPMS CM or TPMS & keyless entry CM
- Defective harness
- Transmitter is faulty.

Trouble symptom:


Every time the engine starts, tire pressure warning light blinks 25 times and then illuminates.

1. CHECK DTC.

Connect the Subaru Select Monitor, and read the DTC.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>Diagnostic Trouble Code \(DTC\).](#)

Are any DTCs displayed?


Yes

Perform the diagnosis for the displayed DTCs.  [Ref. to TIRE PRESSURE MONITOR\(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No


 [Go to 2.](#)

2. CHECK LAN COMMUNICATION.


Inspect LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure>PROCEDURE.](#)

Is the check result OK?

Yes

Perform the diagnosis for DTC U1500.  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC U1500 KEYLESS UART COM. MALFUNCTION.](#)


No

Repair it according to the diagnosis for LAN system.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

TRANSMISSION (DIAGNOSTICS) > Active Test

OPERATION

Caution:

- **Be sure to perform the active test while the engine is not running.**
- **After executing the active test, perform the memory clear.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Clear memory.](#)**

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Transmission].
5. On [Select Function] display, select [Active Test].

Item	Subaru Select Monitor display	Execution condition
Activating the actuator ON/OFF	F&R Clutch Solenoid	When all of the following conditions are met: <ul style="list-style-type: none">• P range• Ignition switch is ON (engine stops)• Battery voltage 10.9 V or more
	Secondary Solenoid	
	Primary Down Solenoid	
	Primary Up Solenoid	
	AWD Solenoid	
	Lock-up duty solenoid	
	Lock-Up ON/OFF Solenoid	

Note:

For detailed operation procedures, refer to "Application help".

TRANSMISSION (DIAGNOSTICS) > AT OIL TEMP Warning Light Display

INSPECTION

Diagnosis:

- CAN communication is lost with the combination meter.
- Combination meter malfunction
- TCM is in special control mode.
- AT learning is not finished.

Trouble symptom:

- When the ignition switch is turned to ON, the AT OIL TEMP light does not illuminate.
- AT OIL TEMP light remains lit after engine start.

1. CHECK TCM.

Check the DTC relating the TCM using the Subaru Select Monitor.

Is DTC U0155 or U0423 displayed?

Yes

Perform the self-diagnosis of combination meter.

No

 [Go to 2.](#)

2. CHECK TCM.

Check the DTC relating the TCM using the Subaru Select Monitor.

Are DTCs other than U0155 and U0423 displayed?

Yes

Perform the diagnosis according to DTC.

No

 [Go to 3.](#)

3. CHECK COMBINATION METER.

Check the DTC of combination meter.


Are any DTCs displayed?

Yes

Perform the diagnosis according to DTC.

No

No


 [Go to 4.](#)

4. CHECK AT OIL TEMP LIGHT.


Turn the ignition switch to ON.

Does AT OIL TEMP light illuminate and then go off in 2 seconds?

Yes

 [Go to 5.](#)

No


Perform the self-diagnosis of combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.](#)

5. CHECK AT OIL TEMP LIGHT.

Start the engine.

Does the AT OIL TEMP light go off?

Yes

Current condition is normal. Go back to Basic Diagnostic Procedure.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No

 [Go to 6.](#)

6. CHECK DTC.

Read the DTC relating the TCM using the Subaru Select Monitor.

Are any DTCs displayed?

Yes

Perform the diagnosis according to DTC.

No


 [Go to 7.](#)

7. CHECK TCM.


Read the data of [ATF Temperature Lamp] using Subaru Select Monitor.

Is "ON" displayed?

Yes

 [Go to 8.](#)

No

Perform the self-diagnosis of combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.](#)

8. CHECK TCM.

Read the data of [ATF Temp.] using Subaru Select Monitor.

Is the display 125°C or more?

Yes

 [Go to 9.](#)

No

Check the TCM.

9. CHECK ATF TEMPERATURE.

Check the real fluid temperature from the transmission case surface temperature.

Does it clearly differ from the [ATF Temp.] displayed on Subaru Select Monitor?

Yes

Perform the diagnosis according to DTC P0712 procedure. If there is no problem, perform the diagnosis according to DTC P0713.

No

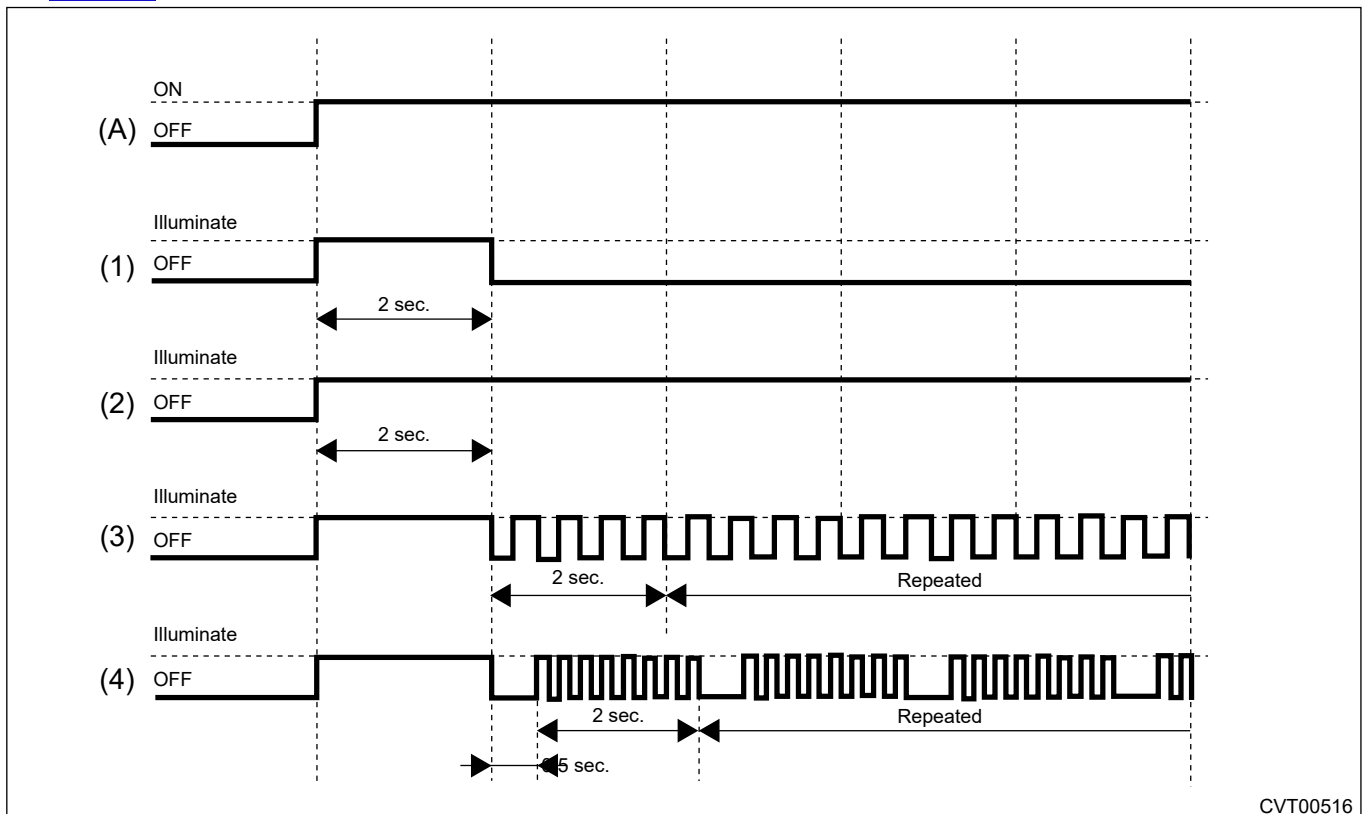
When ATF temperature can be judged as actually high, perform the diagnosis again after the ATF temperature lowers.

TRANSMISSION (DIAGNOSTICS) > AT OIL TEMP Warning Light Display

OPERATION

The AT OIL TEMP light illuminates or blinks, when the ATF temperature is high and malfunction occurs in CVT.

- At normal condition
After turning the ignition switch to ON, illuminates for 2 seconds then goes off.
- When ATF temperature is high
AT OIL TEMP light illuminates when the ATF temperature is abnormally high with the ignition switch ON.
- When malfunction is detected
AT OIL TEMP light blinks at 2 Hz when the TCM detects the malfunction of CVT with the ignition switch ON. In this case, inspect using "Diagnostic Procedure with Diagnostic Trouble Code (DTC)".
[🔗 Ref. to TRANSMISSION \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\).](#)
- When AT learning is not finished
AT OIL TEMP light repeats "Blinking at 4 Hz → Turning OFF" when the AT learning is not completed with the ignition switch ON. In this case, perform the "Learning". (During AT learning, the light blinks at 2 Hz or illuminates.) [🔗 Ref. to TRANSMISSION \(DIAGNOSTICS\)>Learning Control.](#)



CVT00516


(A) Ignition switch condition

(1) At normal condition

(3) When malfunction is detected

(4) When AT learning is not finished

(2) When ATF temperature is high

If the AT OIL TEMP light does not illuminate, or illumination patterns are not as above, check the AT OIL TEMP light circuit.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>AT OIL TEMP Warning Light Display>INSPECTION.](#)

TRANSMISSION (DIAGNOSTICS) > AWD Warning Light Display

INSPECTION

Diagnosis:

- CAN communication is lost with the combination meter.
- Combination meter malfunction
- TCM is in AWD special control mode.

Trouble symptom:

- When the ignition switch is turned to ON, the AWD light does not illuminate.
- AWD light remains lit after engine start.
- AWD light is blinking immediately after engine start.

1. CHECK TCM.


Check the DTC relating the TCM using the Subaru Select Monitor.

Is DTC U0155 or U0423 displayed?

Yes

Perform the self-diagnosis of combination meter.

No

 [Go to 2.](#)

2. CHECK TCM.


Check the DTC relating the TCM using the Subaru Select Monitor.

Are DTCs other than U0155 and U0423 displayed?

Yes

Perform the diagnosis according to DTC.

No

 [Go to 3.](#)

3. CHECK COMBINATION METER.

Check the DTC of combination meter.


Are any DTCs displayed?

Yes

Perform the diagnosis according to DTC.

No

No


 [Go to 4.](#)

4. CHECK AWD LIGHT.


Turn the ignition switch to ON.

Does AWD light illuminate and then go off in 2 seconds?

Yes

 [Go to 5.](#)

No


Perform the self-diagnosis of combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.](#)

5. CHECK AWD LIGHT.

Start the engine.

Does the AWD light go off?

Yes

Current condition is normal. Go back to Basic Diagnostic Procedure.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No

 [Go to 6.](#)

6. CHECK DTC.

Read the DTC relating the TCM using the Subaru Select Monitor.

Are any DTCs displayed?

Yes

Perform the diagnosis according to DTC.

No


 [Go to 7.](#)

7. CHECK AWD LIGHT.


Check the display of AWD light after engine start.

Is AWD light illuminating?

Yes

 [Go to 9.](#)

No

 [Go to 8.](#)

8. CHECK AWD LIGHT.


Check the display of AWD light after engine start.

Is AWD light blinking at 2 Hz?



Yes

 [Go to 10.](#)

No

 [Go to 11.](#)

9. CHECK AWD ON/OFF SWITCHING FUNCTION.

Using the Subaru Select Monitor, select [AWD ON/OFF switching mode] on the [Work Support] display, and check the current mode.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>AWD ON/OFF Switching Mode.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>AWD ON/OFF Switching Mode.](#)

Is the message [At present, the vehicle is in AWD. Switch to FF?] displayed?


Yes

 [Go to 11.](#)

No


If the message [At present, the vehicle is in FF. Switch to AWD?] is displayed, select "ON", and switch to AWD mode.

10. CHECK REAR DIFFERENTIAL.


Using the Subaru Select Monitor, select and check [Rear differential inspection mode] on the [Work Support] display.  [Ref. to DIFFERENTIALS>Rear Differential Inspection Mode.](#)

Does AWD light go off after inspection is finished normally?


Yes

Current condition is normal. Go back to Basic Diagnostic Procedure.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

No

 [Go to 11.](#)

11. CHECK COMBINATION METER.

Perform the self-diagnosis of combination meter.  [Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.](#)

Is there any trouble with the combination meter?

Yes

Repair the combination meter.


No

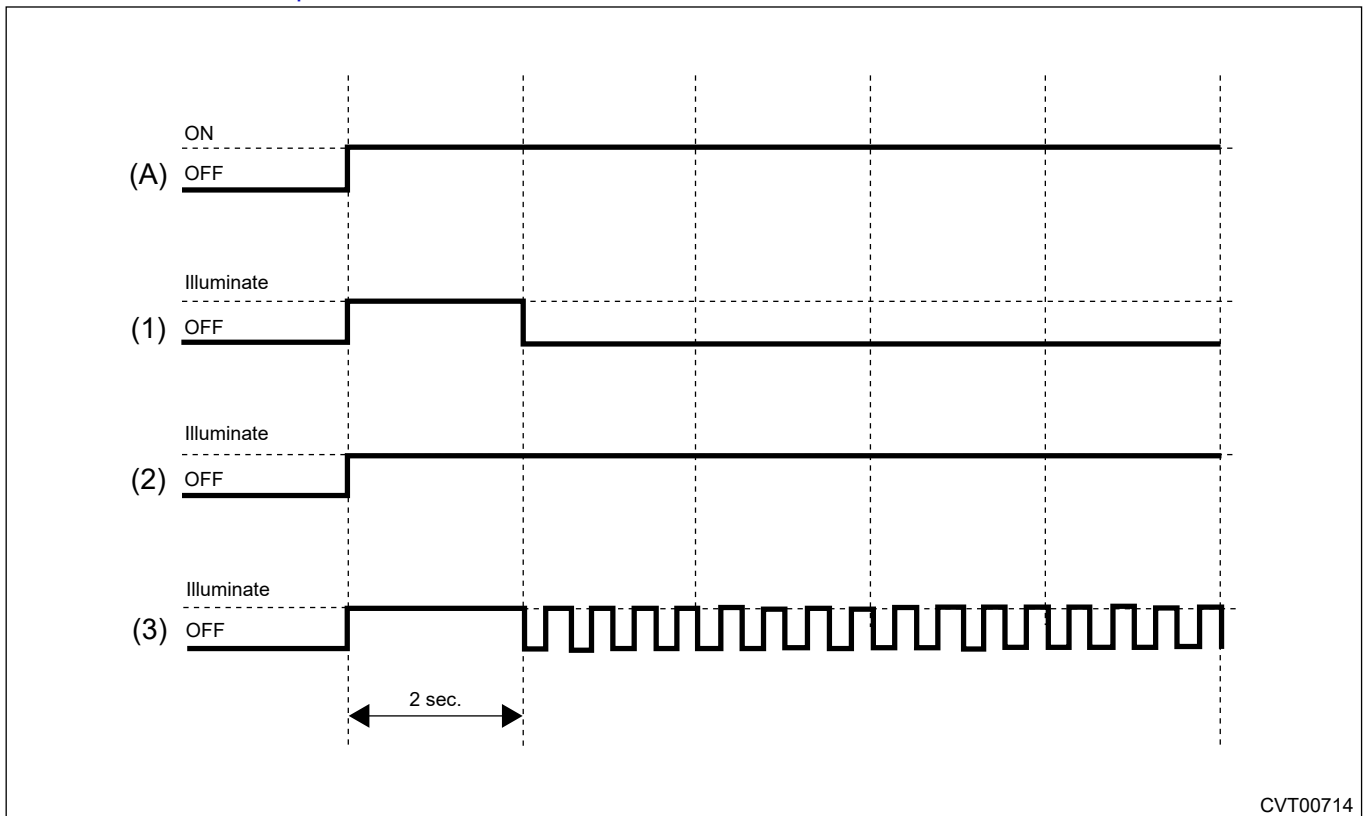
Check the TCM.

TRANSMISSION (DIAGNOSTICS) > AWD Warning Light Display

OPERATION

AWD light illuminates or blinks, when the AWD is in special control condition and AWD has malfunction.

- At normal condition
After turning the ignition switch to ON, illuminates for 2 seconds then goes off.
- When FF mode is selected
AWD light illuminates when the AWD ON/OFF switching function is set to "FF mode" with the ignition switch ON.
- When malfunction is detected
AWD light blinks at 2 Hz when any of the following malfunctions are detected with the ignition switch ON.
 1. When tire with different diameter is installed, or air pressure of any of four wheels is excessively low.
 2. When "Rear differential inspection mode" is judged as NG  [Ref. to DIFFERENTIALS>Rear Differential Inspection Mode.](#)




(A) Ignition switch condition

(1) At normal condition

(2) When FF mode is selected

(3) When malfunction is detected

If the AWD light does not illuminate, or illumination patterns are not as above, check the AWD light circuit.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>AWD Warning Light Display>INSPECTION.](#)

PROCEDURE

1. CHECK PRE-INSPECTION.



1. Ask the customer when and how the trouble occurred using the interview check list.

[Ref. to TRANSMISSION \(DIAGNOSTICS\)>Check List for Interview.](#)

2. Before performing diagnostics, check the following items which might affect CVT problems.

- General inspection [Ref. to TRANSMISSION \(DIAGNOSTICS\)>General Description>INSPECTION.](#)
- Disconnection of harness connector
- Visual check for harness damage
- Oil leakage
- Stall speed test [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Stall Test.](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Stall Test.](#)
- Secondary pressure test [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Secondary Pressure \(Line Pressure\) Test.](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Secondary Pressure \(Line Pressure\) Test.](#)
- Transfer clutch pressure test [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transfer Clutch Pressure Test.](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transfer Clutch Pressure Test.](#)
- Time lag test [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Time Lag Test.](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Time Lag Test.](#)
- Road test [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Road Test.](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Road Test.](#)
- Inhibitor switch [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Inhibitor Switch.](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Inhibitor Switch.](#)

Is the check result OK?

Yes

[Go to 2.](#)

No

Repair the items which may be affecting the CVT trouble.

2. CHECK AT OIL TEMP LIGHT.



Turn the ignition switch to ON and wait for at least 2 seconds.

Does the AT OIL TEMP light illuminate?

Yes

 [Go to 3.](#)

No

Check the AT OIL TEMP light.

3. CHECK AT OIL TEMP LIGHT.

Start the engine and wait for 2 seconds or more.

Does the AT OIL TEMP light blink?

Yes

 [Go to 4.](#)


No

 [Go to 5.](#)

4. CHECK DTC DISPLAY.

Read the DTC.

Note:

If the communication function of Subaru Select Monitor cannot be executed normally, check the communication circuit.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Diagnostic Procedure for Subaru Select Monitor Communication>COMMUNICATION FOR INITIALIZING IMPOSSIBLE.](#)


Is DTC displayed on Subaru Select Monitor?

Yes

Record the DTC, time stamp and freeze frame data.

 [Go to 6.](#)


Note:

- **For the time stamp, refer to LAN section.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>General Description>CAUTION > TIME STAMP.](#)**
- **Depending on DTCs, time stamp may not be stored.**



No

 [Go to 5.](#)

5. PERFORM GENERAL DIAGNOSTICS.

1. Inspect using "Diagnostic Procedure without Diagnostic Trouble Code (DTC)".  [Ref.](#)

[to TRANSMISSION \(DIAGNOSTICS\)>Diagnostic Procedure without Diagnostic Trouble Code \(DTC\).](#)

2. Inspect using "Diagnostics with Phenomenon".  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Diagnostics with Phenomenon.](#)
3. Perform the Inspection Mode.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Inspection Mode.](#)
4. Read the DTC.

Is DTC displayed on Subaru Select Monitor?

Yes


 [Go to 6.](#)

No


Finish the diagnosis.


6. PERFORM DIAGNOSIS.



1. Inspect by referring to "Diagnostic Procedure with Diagnostic Trouble Code (DTC)".  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\).](#)


Note:

For the DTC table, refer to "List of Diagnostic Trouble Code (DTC)".  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

2. Repair the trouble cause.
3. Clear the memory.
4. Perform the Inspection Mode.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Inspection Mode.](#)
5. Read the DTC.

Is DTC displayed on Subaru Select Monitor?

Yes

Inspect by referring to "Diagnostic Procedure with Diagnostic Trouble Code (DTC)".  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\).](#)

No

Finish the diagnosis.

TRANSMISSION (DIAGNOSTICS) > Check List for Interview

CHECK

Check the following items when a problem has occurred.

Note:

Use copies of this page for interviewing customers.



Customer's name			
Date of purchase			
Date of repair			
Transmission model	Transmission	Chassis number	
Odometer reading	km (miles)		
Frequency	<input type="checkbox"/> Continuous <input type="checkbox"/> Intermittent (<input type="checkbox"/> times/day)		
Weather	<input type="checkbox"/> Fine <input type="checkbox"/> Cloudy <input type="checkbox"/> Rainy <input type="checkbox"/> Snowy <input type="checkbox"/> Other ()		
Place	<input type="checkbox"/> Highland <input type="checkbox"/> Suburbs <input type="checkbox"/> Inner city <input type="checkbox"/> Uphill <input type="checkbox"/> Downhill <input type="checkbox"/> Rough road <input type="checkbox"/> Other ()		
Ambient air temperature	<input type="checkbox"/> Hot <input type="checkbox"/> Warm <input type="checkbox"/> Cool <input type="checkbox"/> Cold		
Vehicle speed	km/h (MPH)		
AT OIL TEMP light	<input type="checkbox"/> Blinks continuously	<input type="checkbox"/> Does not blink	
Select lever position	<input type="checkbox"/> P <input type="checkbox"/> R <input type="checkbox"/> N <input type="checkbox"/> D <input type="checkbox"/> Manual mode <input type="checkbox"/> L		
Driving condition	<input type="checkbox"/> Not affected <input type="checkbox"/> At racing <input type="checkbox"/> While decelerating	<input type="checkbox"/> At starting <input type="checkbox"/> While accelerating <input type="checkbox"/> While turning (<input type="checkbox"/> RH / <input type="checkbox"/> LH)	<input type="checkbox"/> While idling <input type="checkbox"/> When cruising (Vehicle speed km/h) <input type="checkbox"/> Immediately after starting the engine
Manual mode	<input type="checkbox"/> ON <input type="checkbox"/> OFF		
Symptoms	<input type="checkbox"/> Vehicle does not move (<input type="checkbox"/> Any position <input type="checkbox"/> Particular position)		
	<input type="checkbox"/> Vehicle does not move (no load racing condition as in N range)		
	<input type="checkbox"/> Vehicle does not move (engine speed does not increase, felt as stall condition)		
	<input type="checkbox"/> Noise or vibration (Describe concretely:)		
	<input type="checkbox"/> Shock felt at N → D selection (<input type="checkbox"/> seconds after shifting, when engine cold or after warm-up)		
<input type="checkbox"/> Shock felt at N → R selection (<input type="checkbox"/> seconds after shifting, when			

engine cold or after warm-up)

Shifting is wrong

(Describe concretely:

)

Shock or judder during driving

Fails to accelerate

Engine speed increases abruptly during driving

Shock or judder during standing start

Select lever does not move

Other

()

TRANSMISSION (DIAGNOSTICS) > Clear memory

OPERATION

- 1.** On [Start] display, select [Diagnosis].
- 2.** On [Vehicle selection] display, enter vehicle information and select [OK].
- 3.** On [Main Menu] display, select [Each System].
- 4.** On [Select System] display, select [Transmission].
- 5.** On [Select Function] display, select [DTC].
- 6.** On [DTC] display, select [Clear memory].

Note:

For detailed operation procedures, refer to “Application help”.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

COMMUNICATION FOR INITIALIZING IMPOSSIBLE

Diagnosis:

Defective harness connector


Trouble symptom:

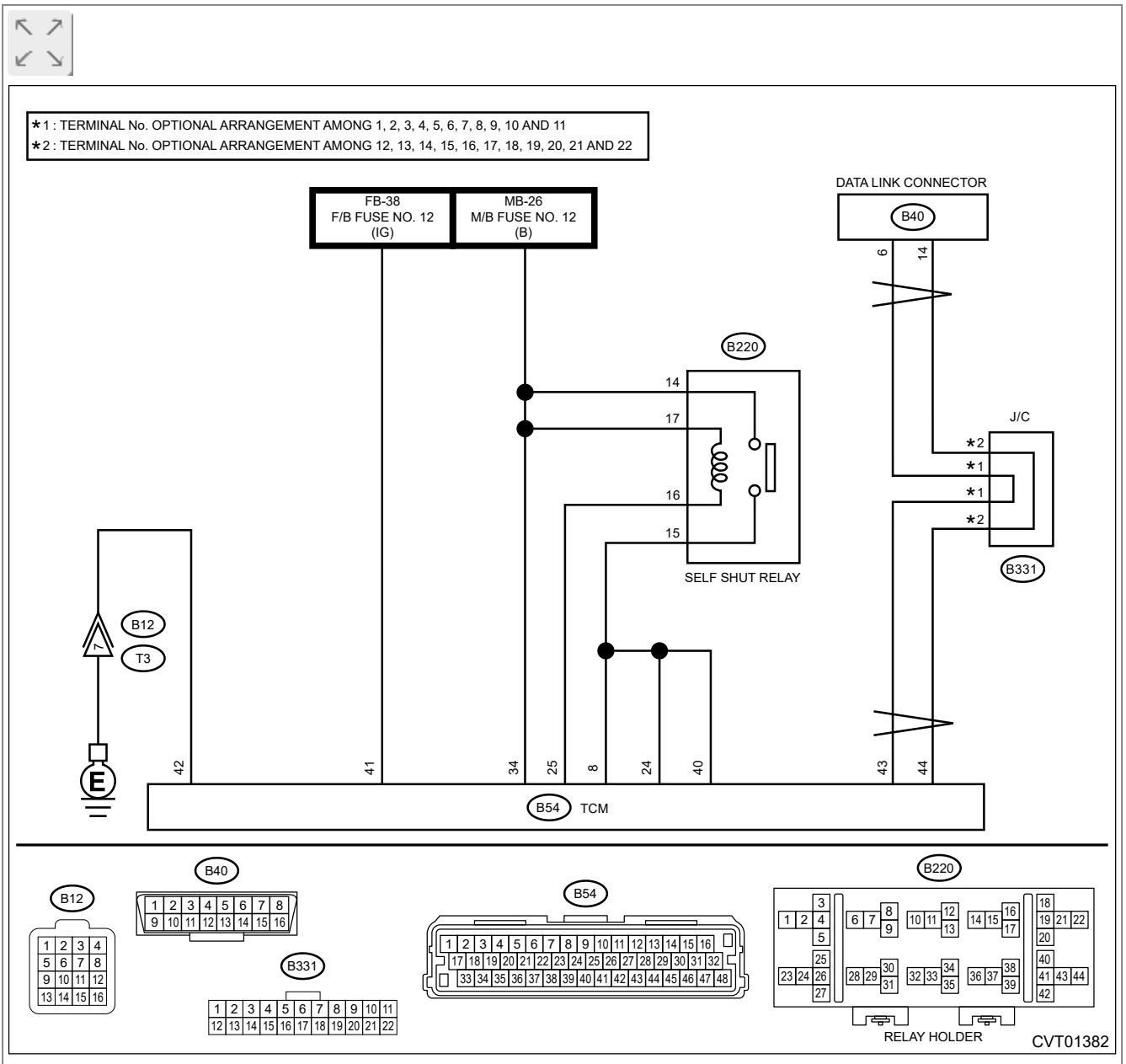
Subaru Select Monitor communication failure

Caution:

Use the check board when measuring the TCM terminal voltage and resistance.

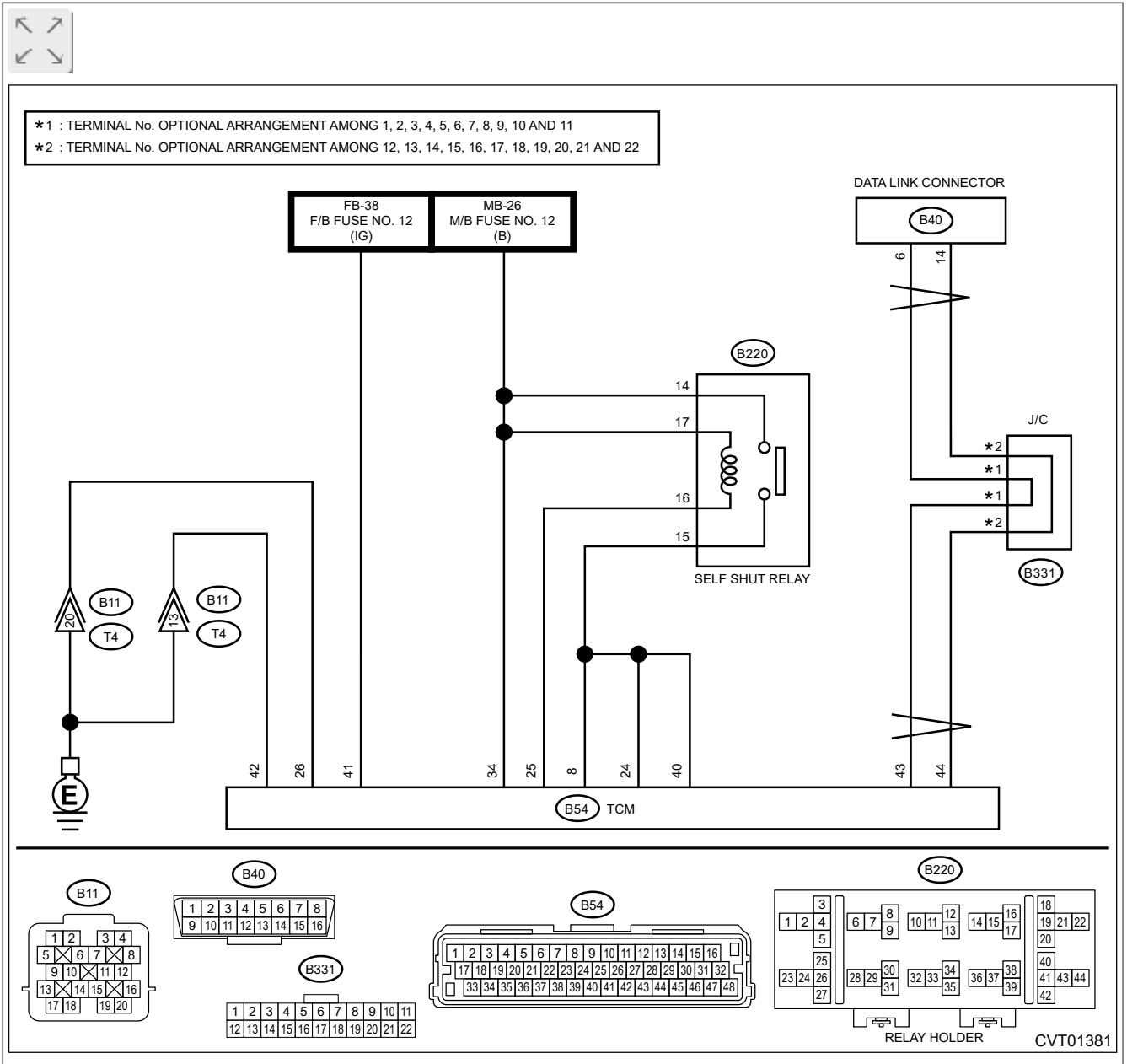
Wiring diagram:

- Non-turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model

CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)




1. CHECK IGNITION SWITCH.



Is the ignition switch ON?

Yes

 [Go to 2.](#)

No

Turn the ignition switch to ON, and select the transmission using the Subaru Select Monitor.

2. CHECK BATTERY.



1. Turn the ignition switch to OFF.
2. Measure the battery voltage.

Is the voltage 11 V or more?

Yes

[Go to 3.](#)

No

Charge or replace the battery.

3. CHECK BATTERY TERMINAL.



Is there poor contact at battery terminal?

Yes

Replace or tighten the battery terminal.

No

[Go to 4.](#)

4. CHECK INSTALLATION OF TCM CONNECTOR.



Turn the ignition switch to OFF.

Is the TCM connector inserted into the TCM until the clamp locks?

Yes

[Go to 5.](#)

No

Insert the TCM connector to TCM.

5. CHECK LAN SYSTEM.



Perform the diagnosis for LAN system. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

Is there any fault in LAN system?

Yes

Perform the diagnosis according to DTC for LAN system. [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 6.](#)

6. CHECK SUBARU SELECT MONITOR COMMUNICATION.



1. Turn the ignition switch to ON.
2. Check whether communication to transmission system can be executed normally.

Is the [Select Function] display displayed?

Yes

Check DTC of TCM. [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Read Diagnostic Trouble Code \(DTC\).](#)

No

[Go to 7.](#)

7. CHECK POWER SUPPLY CIRCUIT.



1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Turn the ignition switch to ON. (Engine OFF)
4. Measure the ignition power supply voltage between TCM connector and chassis ground.

Connector & terminal

(B54) No. 34 (+) — Chassis ground (-):

(B54) No. 8 (+) — Chassis ground (-):

(B54) No. 24 (+) — Chassis ground (-):

(B54) No. 41 (+) — Chassis ground (-):

(B54) No. 40 (+) — Chassis ground (-):

Is the voltage 10 — 13 V?

Yes

[Go to 8.](#)

No

Repair the open circuit of harness between TCM and battery.

8. CHECK HARNESS CONNECTOR BETWEEN TCM AND CHASSIS GROUND.



1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between TCM connector and chassis ground.

Connector & terminal

(B54) No. 42 — Chassis ground:

Is the resistance less than 10 Ω ?

[Go to 9.](#)

Yes

No

Repair the open circuit of the TCM ground circuit and poor contact of connector.

9. CHECK POOR CONTACT OF CONNECTOR.



Is there poor contact of control module power supply, ground circuit and data link connector?

Yes

Repair the connector.

No

Check the TCM.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0500 VEHICLE SPEED SENSOR "A" CIRCUIT

DTC detecting condition:

Immediately at fault recognition


Trouble symptom:

VDC does not operate.

1. CHECK DTC.

Read the DTC of VDC system using the Subaru Select Monitor.

Are any DTCs displayed?

Yes Perform the diagnosis according to DTC.  [Ref. to BRAKE CONTROL \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)

No Repair the poor contact of connector and harness between VDCCM&H/U and wheel speed sensor.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of VDC wheel speed sensor.
- Judge as NG when the wheel speed sensor normal status signal from VDC is cleared.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	≥10.9 V

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Vehicle speed (front wheel) from vehicle dynamics control (VDC) module Note: The VDC controller detects malfunction if one of the speed sensors does not output a signal and the other vehicle speed sensor output signal is above 7.46 MPH	≥ 186.4 MPH

Time needed for diagnosis: 2.5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0601 INTERNAL CONTROL MODULE MEMORY CHECKSUM ERROR

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

TCM ROM malfunction

1. CHECK DTC.

1. Perform the memory clear using the Subaru Select Monitor. [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Clear memory.](#)
2. Read the DTC.

Is DTC P0601 displayed?

Yes Replace the TCM. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No Current condition is normal. Check for interference from noise, etc.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction in ROM area of the TCM.
- Judge as NG when the consistency in the ROM area is lost.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 9 V

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Checksum (ROM)	Error

Time needed for diagnosis: Immediately

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

TCM RAM malfunction

1. CHECK DTC.

1. Perform the memory clear using the Subaru Select Monitor. [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Clear memory.](#)
2. Read the DTC.

Is DTC P0604 displayed?

Yes Replace the TCM. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No Current condition is normal. Check for interference from noise, etc.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction in RAM area of the TCM.
- Judge as NG if an attempt to write to RAM area failed.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Writing-check (RAM) Note: This check is carried out about the RAM only used for CAN communication.	Error

Time needed for diagnosis: Immediately

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P062F INTERNAL CONTROL MODULE EEPROM ERROR


DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:



TCM EEPROM malfunction

1. CHECK DTC. ▼

1. Perform the memory clear using the Subaru Select Monitor.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Clear memory.](#)
2. Read the DTC.

Is DTC P062F displayed?

Yes

Replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

Current condition is normal. Check for interference from noise, etc.

1. OUTLINE OF DIAGNOSIS

Diagnosis 1

- Detect the malfunction in EEPROM area of the TCM.
- Judge as NG if an attempt to write to EEPROM area failed.

Diagnosis 2

- Detect the malfunction in EEPROM area of the TCM.
- Judge as NG when the consistency in the EEPROM area is lost.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Diagnosis 1	
12 V battery system voltage	≥ 9 V
Diagnosis 2	
12 V battery system voltage	≥ 9 V

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

--	--

Malfunction Criteria	Threshold Value
Diagnosis 1	
Writing-check (EEPROM)	Error
Diagnosis 2	
Checksum (EEPROM)	Error

Time needed for diagnosis: Immediately

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0705 TRANSMISSION RANGE SENSOR "A" CIRCUIT (PRNDL INPUT)

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:


- Shift characteristics are erroneous.
- The range position of the select lever and the position of shift indicator display do not match.

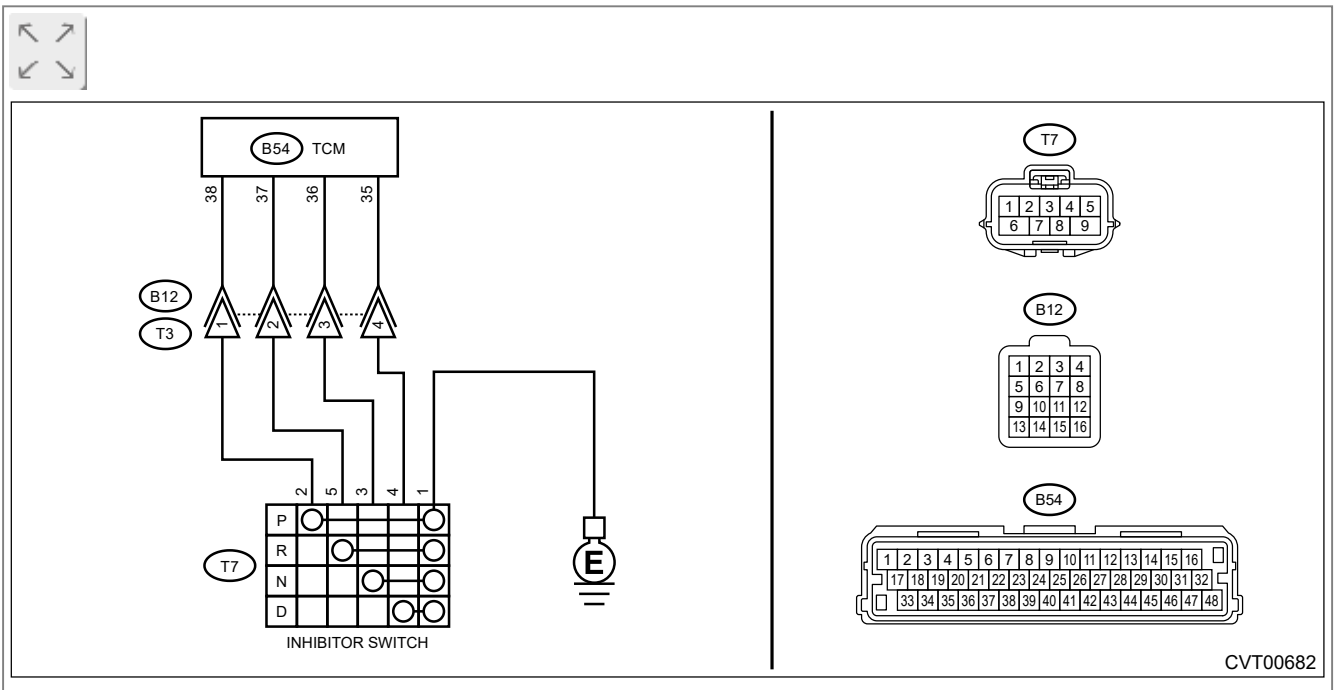
Caution:

Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

Wiring diagram:

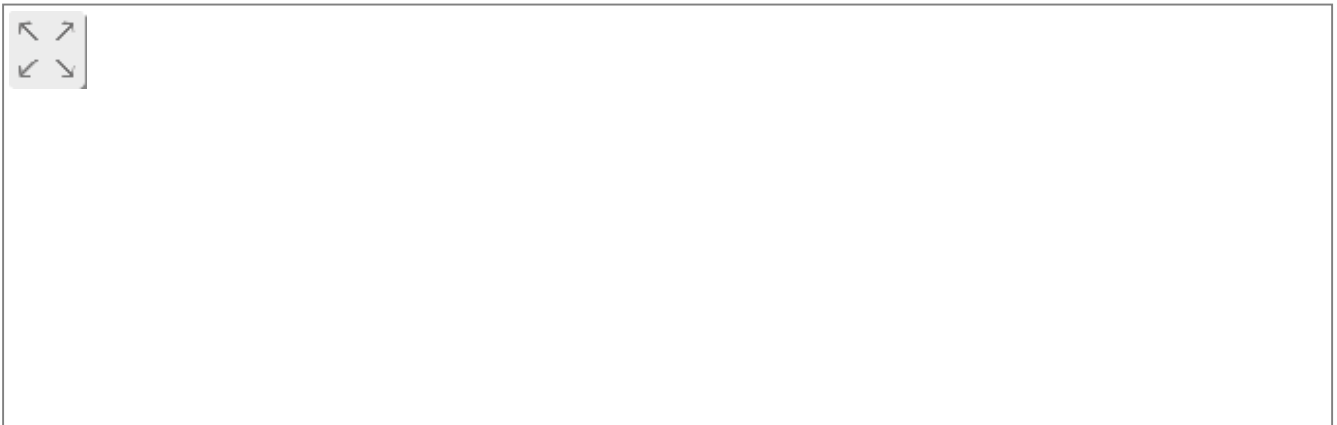
- Non-turbo model

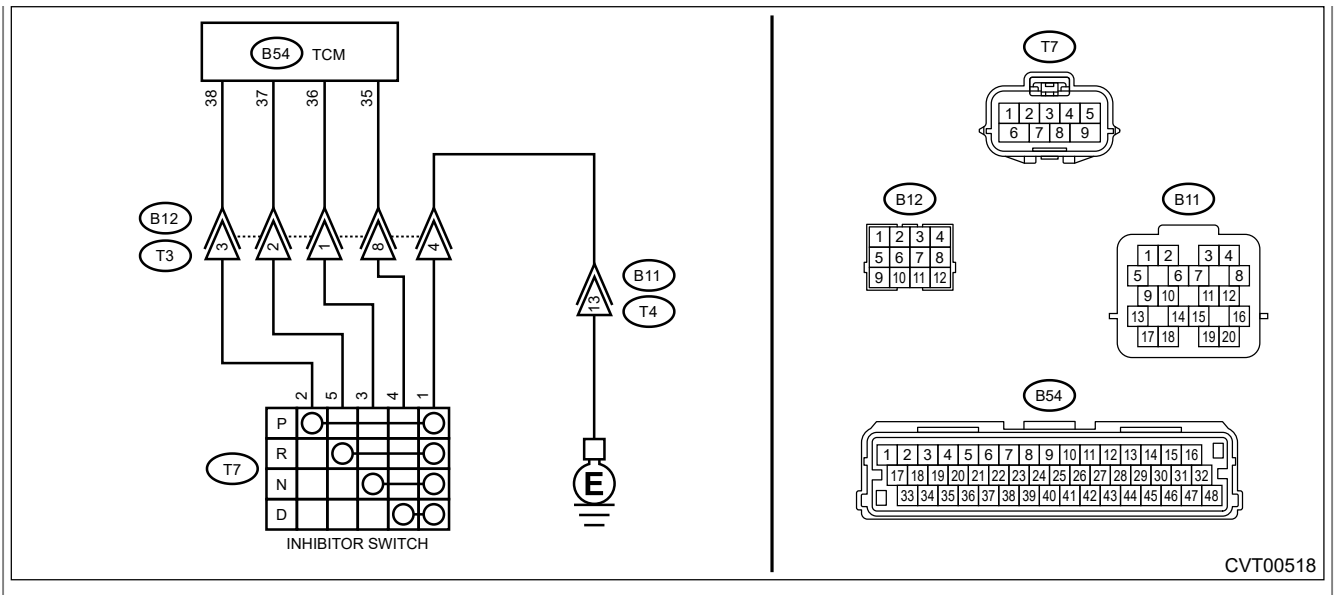
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model

CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK INPUT SIGNAL FOR TCM.

1. Turn the ignition switch to ON.
2. Move the select lever to each range, read the data of [P Range], [R Range Signal], [N Range] and [D Range Signal] using the Subaru Select Monitor.

Is display "OFF" for the range other than corresponding range?

Yes

[Go to 5.](#)

No

[Go to 2.](#)

2. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(B54) No. 38 — Chassis ground:

(B54) No. 37 — Chassis ground:

(B54) No. 36 — Chassis ground:

(B54) No. 35 — Chassis ground:

Is each resistance 1 MΩ or more?

Yes

[Go to 3.](#)

No

Repair the short circuit of body harness.

3. CHECK HARNESS.



1. Disconnect the inhibitor switch connector.
2. Measure the resistance between transmission connector and chassis ground.

Connector & terminal

Non-turbo model

(T3) No. 1 — Chassis ground:

(T3) No. 2 — Chassis ground:

(T3) No. 3 — Chassis ground:

(T3) No. 4 — Chassis ground:

Turbo model

(T3) No. 3 — Chassis ground:

(T3) No. 2 — Chassis ground:

(T3) No. 1 — Chassis ground:

(T3) No. 8 — Chassis ground:

Is each resistance 1 MΩ or more?

Yes

 [Go to 4.](#)

No

Repair the short circuit of transmission harness.

4. CHECK INHIBITOR SWITCH.



Move the select lever to each range, and measure the resistance between inhibitor switch terminals.

Terminals

No. 2 — No. 1:

No. 5 — No. 1:

No. 3 — No. 1:



No. 4 — No. 1:

Is the resistance other than corresponding range 1 MΩ or more?

Yes

 [Go to 5.](#)

No

Replace the inhibitor switch.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Inhibitor Switch.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Inhibitor Switch.](#)

5. CHECK FOR POOR CONTACT.





Is there poor contact between TCM, inhibitor switch, transmission ground?

Yes

Repair the poor contact.

No

Replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of Range Switch.
- Judge as NG if more than one input of Range Switch are detected.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Engine speed	≥ 400 rpm

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Two or more transmission range switches ON Note: "Transmission range switch ON" is defined as Transmission range switch input voltage ≤1.7 V	True

Time needed for diagnosis: 3 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0708 TRANSMISSION RANGE SENSOR "A" CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition


Trouble symptom:

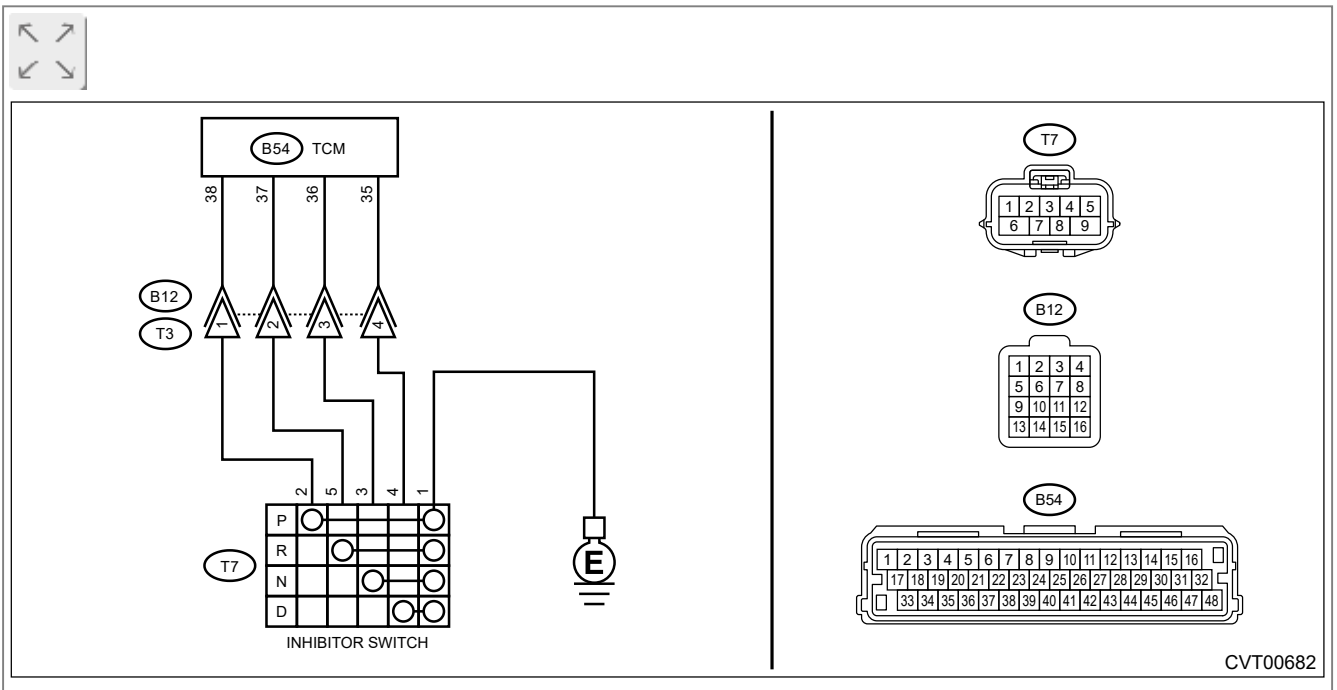
- Shift characteristics are erroneous.
- The range position of the select lever and the position of shift indicator display do not match.

Caution:

Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

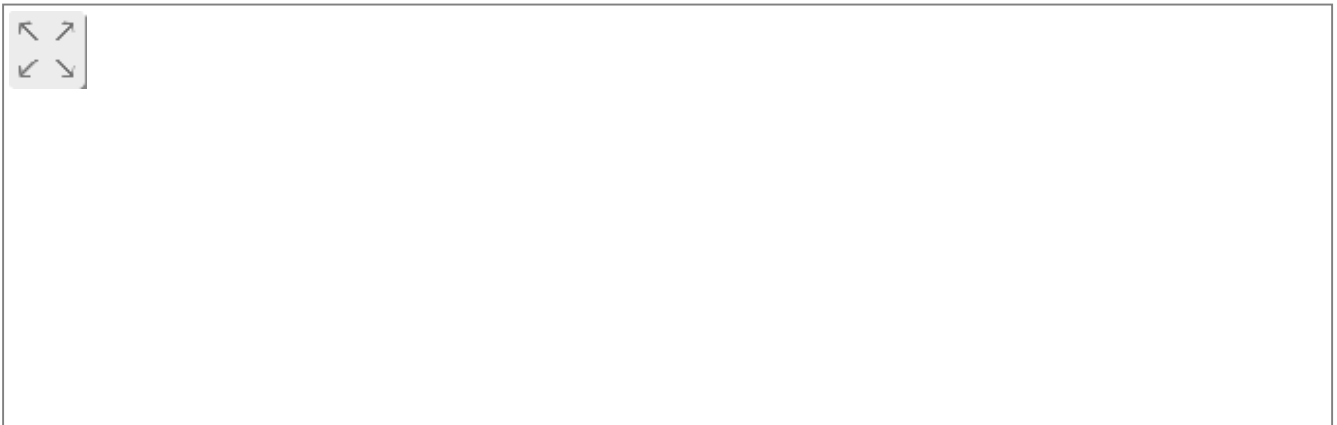
Wiring diagram:

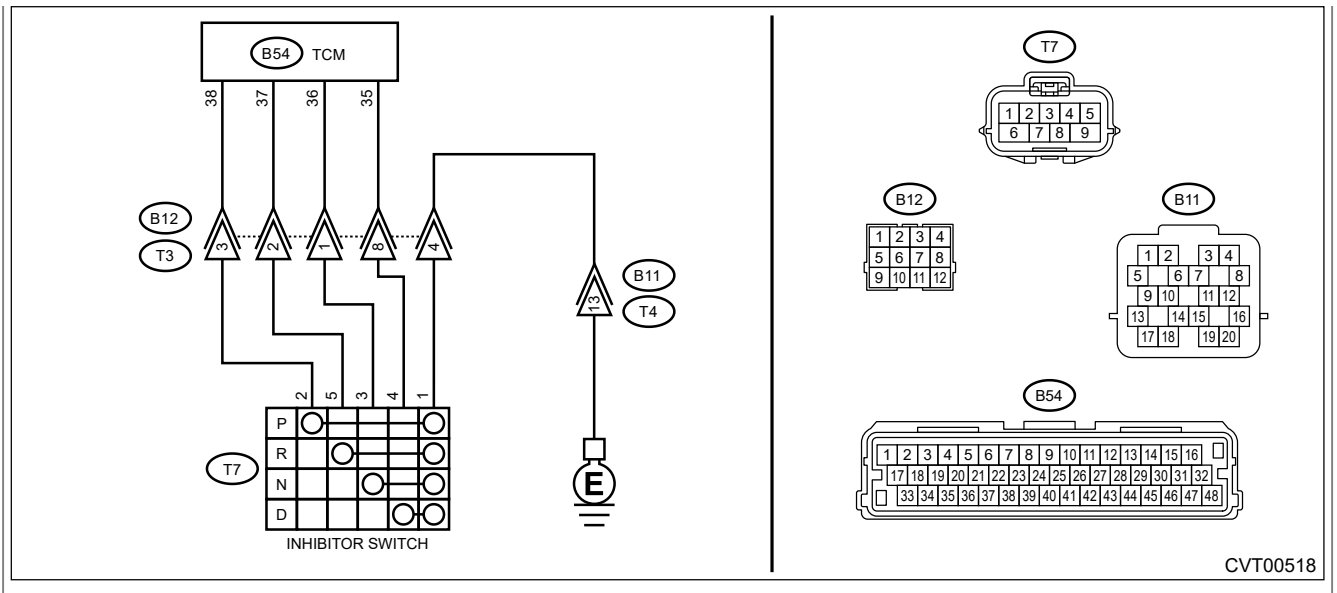
- Non-turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model

CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





CVT00518

1. CHECK INPUT SIGNAL FOR TCM.

1. Turn the ignition switch to ON.
2. Move the select lever to each range, read the data of [P Range], [R Range Signal], [N Range] and [D Range Signal] using the Subaru Select Monitor.

Is the display of the corresponding range "ON"?

Yes

[Go to 7.](#)

No

[Go to 2.](#)

2. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Measure the resistance of harness between TCM connector and transmission connector.

Connector & terminal

Non-turbo model

- (B54) No. 38 — (B12) No. 1:
- (B54) No. 37 — (B12) No. 2:
- (B54) No. 36 — (B12) No. 3:
- (B54) No. 35 — (B12) No. 4:

Turbo model

- (B54) No. 38 — (B12) No. 3:
- (B54) No. 37 — (B12) No. 2:
- (B54) No. 36 — (B12) No. 1:

(B54) No. 35 — (B12) No. 8:

Is each resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit of body harness.

3. CHECK HARNESS.



Measure the resistance of harness between inhibitor switch connector and transmission ground.

Connector & terminal

(T7) No. 1 — Transmission ground:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Repair the open circuit of harness.

4. CHECK HARNESS.



1. Disconnect the inhibitor switch connector.
2. Measure the resistance between transmission connector and inhibitor switch connector.

Connector & terminal

Non-turbo model

(T3) No. 1 — (T7) No. 2:

(T3) No. 2 — (T7) No. 5:

(T3) No. 3 — (T7) No. 3:

(T3) No. 4 — (T7) No. 4:

Turbo model

(T3) No. 3 — (T7) No. 2:


(T3) No. 2 — (T7) No. 5:

(T3) No. 1 — (T7) No. 3:

(T3) No. 8 — (T7) No. 4:

Is each resistance less than 1 Ω ?

Yes

 [Go to 5.](#)

No

Repair the open circuit of transmission harness.

5. CHECK INHIBITOR SWITCH.



Move the select lever to each range, and measure the resistance between inhibitor switch terminals.

Terminals

- No. 2 — No. 1:
- No. 5 — No. 1:
- No. 3 — No. 1:
- No. 4 — No. 1:

Is the resistance of the corresponding range less than 1 MΩ?

Yes

[Go to 6.](#)

No

Replace the inhibitor switch. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Inhibitor Switch.](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Inhibitor Switch.](#)

6. CHECK HARNESS.



1. Turn the ignition switch to ON.
2. Measure the voltage between each connector and chassis ground.

Connector & terminal

Transmission connector (B12 side)

Non-turbo model

- (B12) No. 1 (+) — Chassis ground (–):
- (B12) No. 2 (+) — Chassis ground (–):
- (B12) No. 3 (+) — Chassis ground (–):
- (B12) No. 4 (+) — Chassis ground (–):

Turbo model

- (B12) No. 3 (+) — Chassis ground (–):
- (B12) No. 2 (+) — Chassis ground (–):
- (B12) No. 1 (+) — Chassis ground (–):
- (B12) No. 8 (+) — Chassis ground (–):

Transmission connector (T7 side)

- (T7) No. 2 (+) — Chassis ground (–):
- (T7) No. 5 (+) — Chassis ground (–):
- (T7) No. 3 (+) — Chassis ground (–):
- (T7) No. 4 (+) — Chassis ground (–):

Is each voltage less than 1 V?

Yes

[Go to 7.](#)

No

Repair the harness which outputs 1 V or more.

7. CHECK FOR POOR CONTACT.



Is there poor contact between TCM, inhibitor switch, transmission ground?

Yes

Repair the poor contact.

No

Replace the TCM. Ref. to [CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\)](#). Ref. to [CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\)](#).

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of Range Switch.
- Judge as NG if there is no input from all Range Switches.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Vehicle speed (calculated from measured output shaft speed)	≥ 6 MPH

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
All transmission range switches OFF Note: "Transmission range switch OFF" is defined as Transmission range switch input voltage ≥ 3.4 V	True

Time needed for diagnosis: 3 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0711 TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:



Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Excessive shift shock
- Shift characteristics malfunction

Note:

For the diagnostic procedure, perform the diagnosis according to DTC P0712 and P0713.

 [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0712 TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT LOW.](#)  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0713 TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT HIGH.](#)

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

Diagnosis 1

- Detect the malfunction of the transmission oil temperature sensor characteristics (stuck to low temperature side).
- Judge as NG if the amount of oil temperature change since ignition ON is equal to or below the predetermined value.

Diagnosis 2

- Detect the malfunction of the transmission oil temperature sensor characteristics (stuck to high temperature side).
- Judge as NG when the difference of engine coolant temperature and CVT oil temperature exceeds the predetermined value both when starting engine and when driving.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
Diagnosis 1	
12 V battery system voltage	≥ 10 V
Engine speed (The timer is held when the following conditions are not satisfied.)	> 600 rpm
Transmission range	Drive
Vehicle speed (calculated from measured secondary pulley shaft speed sensor)	≥21.9 MPH
Diagnosis 2	
12 V battery system voltage	≥ 10 V
Soak time (received from ECM)	≥ 21600 s
(Engine speed for time)	≥ 400 rpm ≥ 300 s
Note:	

The monitor detects TFT sensor stuck high after the elapse of 300 seconds required for ECT sensor diagnosis. It is necessary to avoid misdiagnosis of P0711 caused by a malfunctioning ECT sensor.

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Diagnosis 1	
Absolute change of measured Transmission fluid temperature sensor input voltage	≤0.049 V
Transmission fluid temperature	< 20 degC
Diagnosis 2	
Transmission fluid temperature at engine start – ECT at engine start	> 18°C

Time needed for diagnosis:

- **Diagnosis 1:** 600 s
- **Diagnosis 2:** Immediately

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

Diagnosis 1

- Detect the malfunction of the transmission oil temperature sensor characteristics (stuck to low temperature side).
- Judge as NG if the amount of oil temperature change since ignition ON is equal to or below the predetermined value.

Diagnosis 2

- Detect the malfunction of the transmission oil temperature sensor characteristics (stuck to high temperature side).
- Judge as NG when the difference of engine coolant temperature and CVT oil temperature exceeds the predetermined value both when starting engine and when driving.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
Diagnosis 1	
12 V battery system voltage	≥ 10 V
Engine speed (The timer is held when the following conditions are not satisfied.)	> 600 rpm
Transmission range	Drive
Vehicle speed (calculated from measured output shaft speed sensor)	≥21.9 MPH

Diagnosis 2	
12 V battery system voltage	≥ 10 V
Soak time (received from ECM)	≥ 21600 s
(Engine speed for time) Note: The monitor detects TFT sensor stuck high after the elapse of 300 seconds required for ECT sensor diagnosis. It is necessary to avoid misdiagnosis of P0711 caused by a malfunctioning ECT sensor.	≥ 400 rpm ≥ 300 s

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Diagnosis 1	
Absolute change of measured Transmission fluid temperature sensor input voltage	< 0.049 V
Transmission fluid temperature	< 20 degC
Diagnosis 2	
Transmission fluid temperature at engine start – ECT at engine start	> 18°C

Time needed for diagnosis:

- **Diagnosis 1:** 600 s
- **Diagnosis 2:** Immediately

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0712 TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:


- Excessive shift shock
- Shift characteristics malfunction

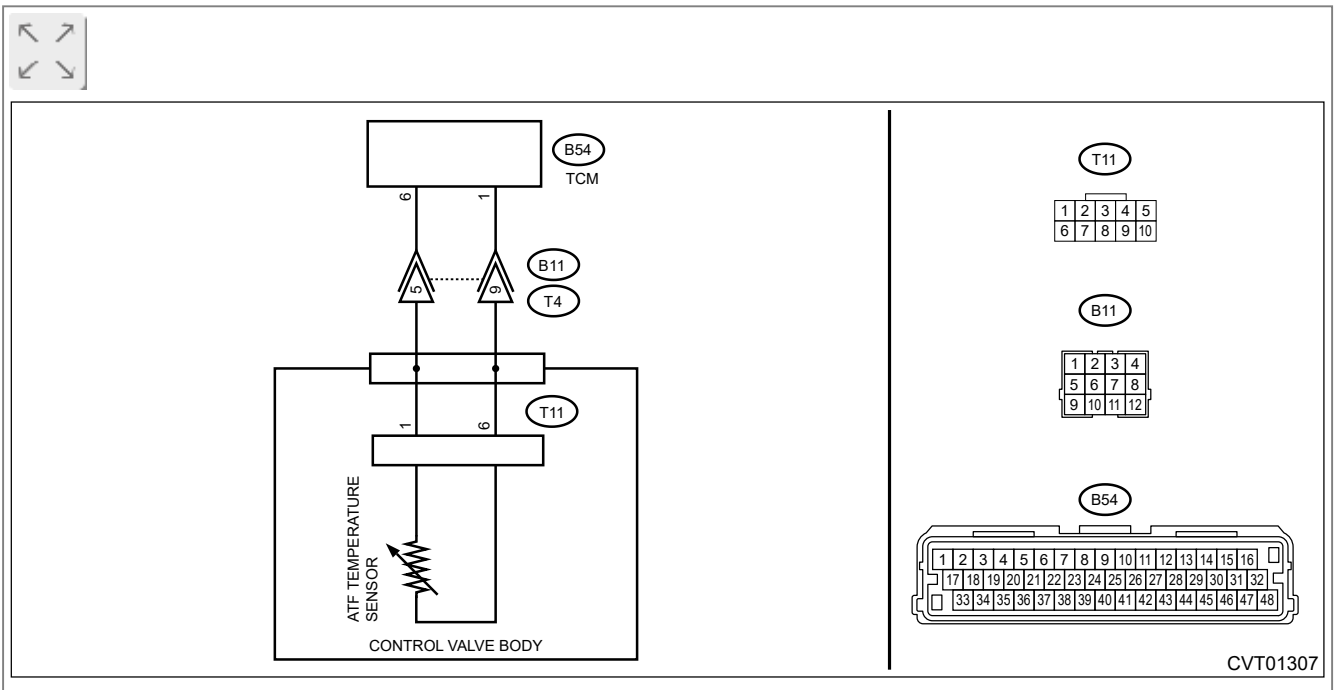
Caution:

Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

Wiring diagram:

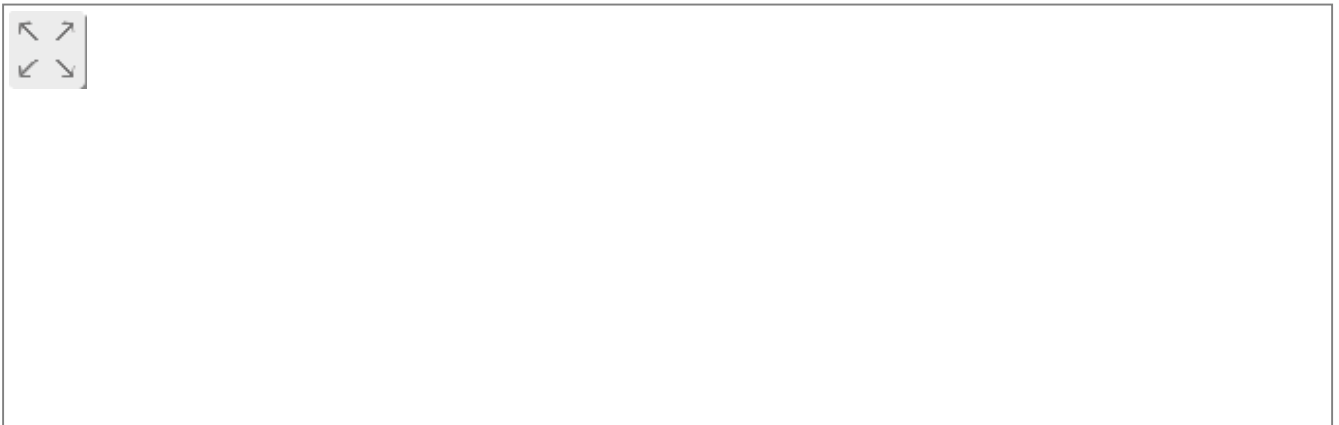
- Non-turbo model

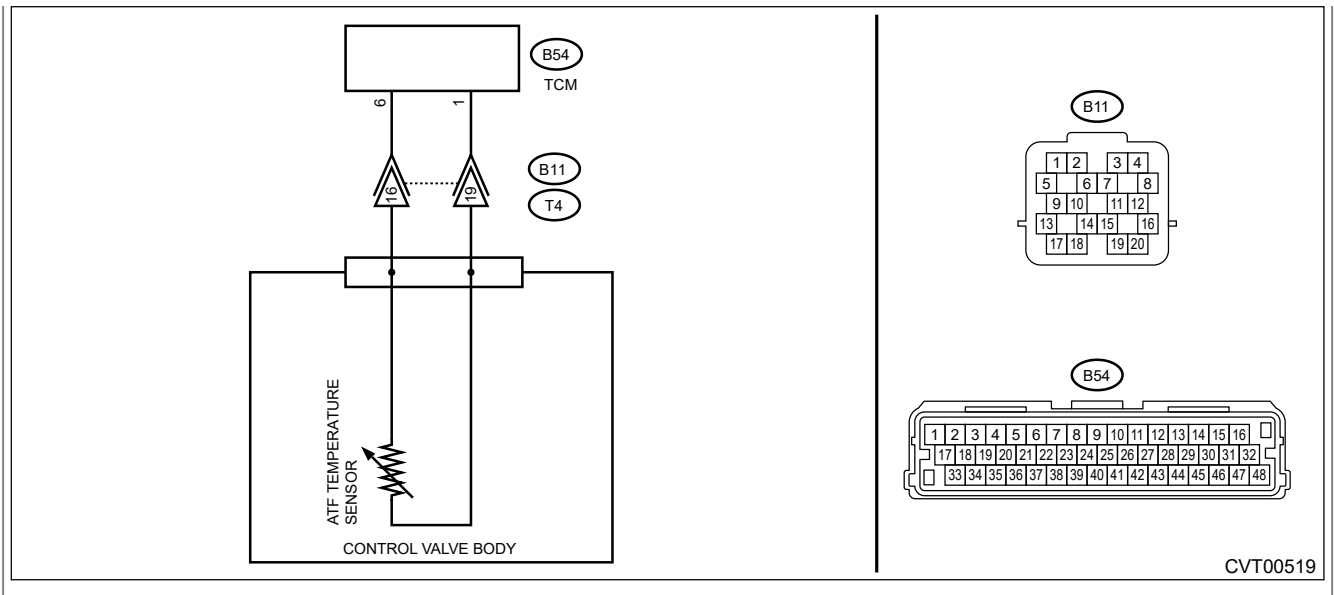
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model

CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Measure the resistance of harness between TCM connector and chassis ground.

Connector & terminal

(B54) No. 1 — Chassis ground:

(B54) No. 6 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

[Go to 4.](#)

No

[Go to 2.](#)

2. CHECK HARNESS.

1. Disconnect the transmission connector.
2. Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model

(T4) No. 5 — Transmission body:

(T4) No. 9 — Transmission body:

Turbo model

(T4) No. 16 — Transmission body:


(T4) No. 19 — Transmission body:

Is the resistance 1 M Ω or more?

Yes

Repair the short circuit of body harness.

No

 [Go to 3.](#)

3. CHECK HARNESS INSIDE TRANSMISSION.

Caution:

Start work after ATF cools down.

1. Remove the following parts.
 - Transmission valve cover (non-turbo model)
 - Transmission oil pan (turbo model)
2. Check for the harness pinch, damage.

Is there any fault in the harness?

Yes

Replace the transmission harness.

No

 [Go to 4.](#)

4. CHECK ATF TEMPERATURE SENSOR.

Measure the resistance between transmission connector terminals.

Connector & terminal

Non-turbo model

(T11) No. 1 — No. 6:

Turbo model

(T4) No. 16 — No. 19:



Note:

Perform the measurements using multiple oil temperatures.

Is resistance as follows?



- Non-turbo model
 - Fluid temperature 0°C → Approx. 6.0 kΩ
 - Fluid temperature 20°C → Approx. 2.5 kΩ
 - Fluid temperature 80°C → Approx. 330 Ω
- Turbo model
 - Fluid temperature 0°C → Approx. 6.2 kΩ
 - Fluid temperature 20°C → Approx. 2.6 kΩ
 - Fluid temperature 80°C → Approx. 370 Ω

Yes

Replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to](#)

[CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

Replace the control valve body.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect the ground short circuit of transmission oil temperature sensor.
- Judge as NG if the voltage detected by the transmission oil temperature sensor is lower than the predetermined value.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	$\geq 9 \text{ V}$

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured Transmission fluid temperature sensor input voltage	$< 0.117 \text{ V}$
(Transmission fluid temperature)	$(> 146 \text{ degC})$

Time needed for diagnosis: 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect the ground short circuit of transmission oil temperature sensor.
- Judge as NG if the voltage detected by the transmission oil temperature sensor is lower than the predetermined value.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	$\geq 9 \text{ V}$

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured Transmission fluid temperature sensor input voltage	$< 0.132 \text{ V}$
(Transmission fluid temperature)	$(> 150 \text{ degC})$

Time needed for diagnosis: 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0713 TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Excessive shift shock
- Shift characteristics malfunction

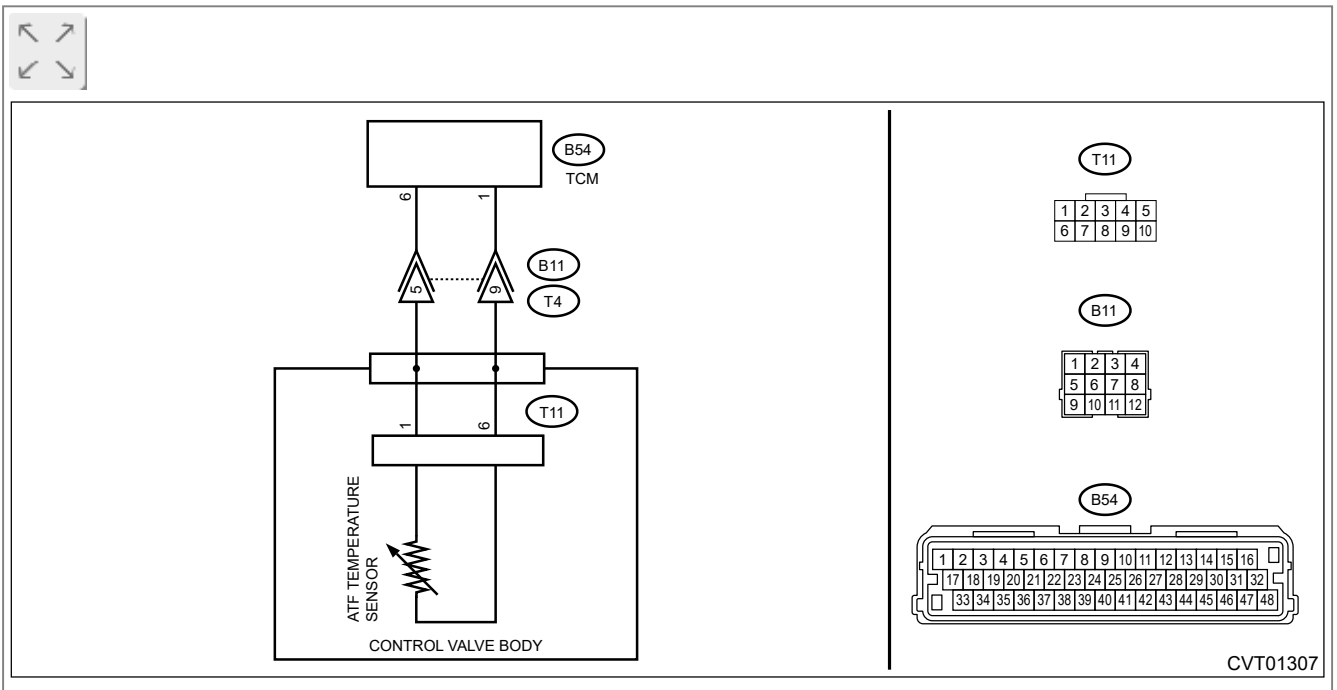
Caution:

Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

Wiring diagram:

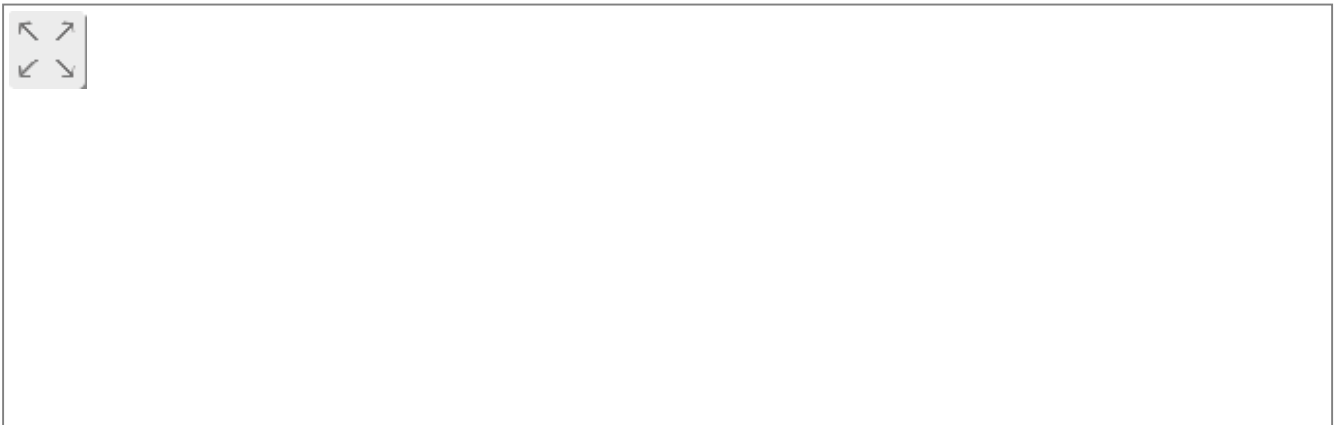
- Non-turbo model

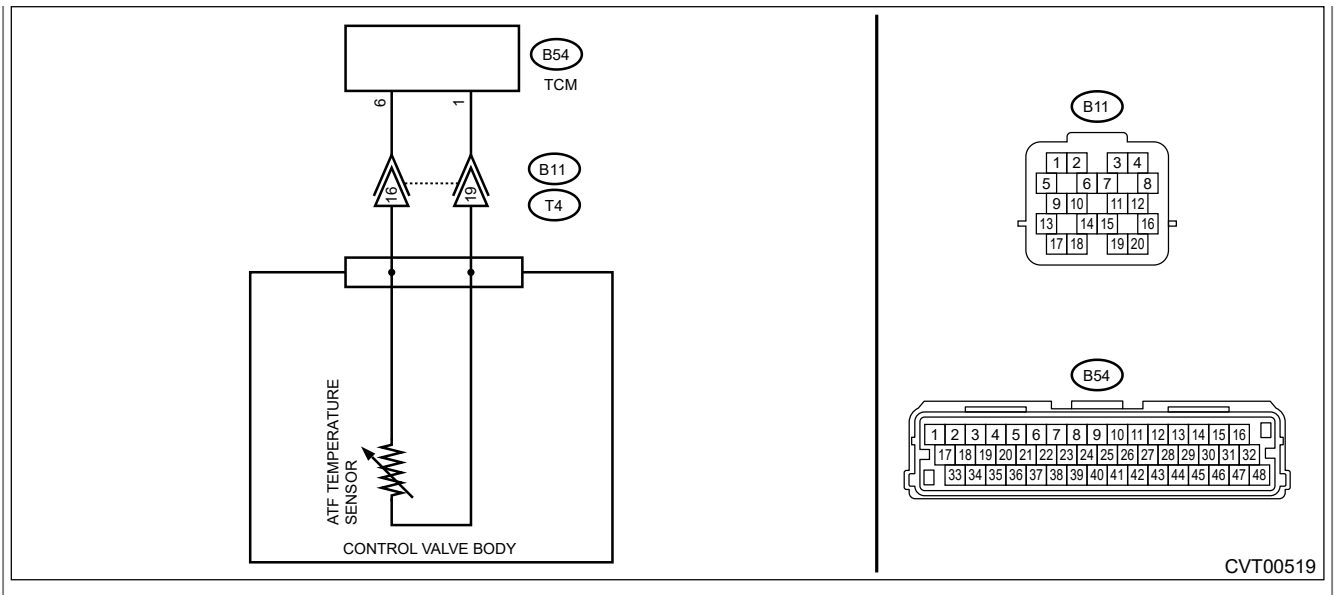
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model

CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between TCM connectors.

Connector & terminal


(B54) No. 6 (+) – (B54) No. 1 (-):

Is the voltage 5 V or more?

Yes

Repair the short circuit of harness.

No

 [Go to 2.](#)

2. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the transmission connector.
3. Measure the resistance between TCM connector and transmission connectors.

Connector & terminal

Non-turbo model

(B54) No. 6 – (B11) No. 5:

(B54) No. 1 – (B11) No. 9:

Turbo model

(B54) No. 6 – (B11) No. 16:

(B54) No. 1 – (B11) No. 19:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit of body harness.

3. CHECK ATF TEMPERATURE SENSOR.

Measure the resistance between transmission connector terminals.

Connector & terminal

Non-turbo model

(T4) No. 5 — No. 9:

Turbo model

(T4) No. 16 — No. 19:

Is the resistance 1 M Ω or more?

Yes

- Non-turbo model

 [Go to 4.](#)

- Turbo model

Repair the open circuit of transmission harness.

No

 [Go to 5.](#)

4. CHECK HARNESS.

Caution:

Start work after ATF cools down.

1. Remove the transmission valve cover.
2. Measure the resistance between transmission connector and control valve body connector.

Connector & terminal

(T4) No. 5 — (T11) No. 1:

(T4) No. 9 — (T11) No. 6:

Is the resistance less than 1 Ω ?

Yes

Repair the open circuit of transmission harness on the control valve side.

No

Repair the open circuit of transmission harness on the outside of the transmission.

5. CHECK ATF TEMPERATURE SENSOR.

1. Connect all connectors.
2. Start the engine.
3. Warm up until the ATF temperature exceeds 50°C (122°F).
4. Turn the ignition switch to OFF.
5. Disconnect the transmission connector.
6. Measure the resistance between transmission connector terminals.

Connector & terminal

Non-turbo model

(T4) No. 5 — No. 9:

Turbo model

(T4) No. 16 — No. 19:

Is resistance as follows?

- Non-turbo model

650 — 990 Ω


- Turbo model

730 — 1120 Ω

Yes

 [Go to 6.](#)

No

 [Go to 8.](#)

6. CHECK ATF TEMPERATURE SENSOR.



Measure the resistance between transmission connector terminals.

Connector & terminal

Non-turbo model

(T4) No. 5 — No. 9:

Turbo model



(T4) No. 16 — No. 19:

Does the resistance value increase gradually while the ATF temperature decreases?

Yes

 [Go to 7.](#)

No

Replace the control valve body.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

7. CHECK INPUT SIGNAL FOR TCM.



1. Connect the transmission connector.


2. Turn the ignition switch to ON. (Do not start engine.)
3. Read the data of [ATF Temp.] using Subaru Select Monitor.

Does the ATF temperature gradually decrease?

Yes

Check for poor contact of the ATF temperature sensor and transmission connector harness, and repair the defective part.

No

 [Go to 8.](#)



8. CHECK FOR POOR CONTACT.

Is there poor contact of ATF temperature sensor circuit?

Yes

Repair the poor contact.

No

Replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect short circuit to power supply or open circuit of the transmission oil temperature sensor 5 V system.
- Judge as NG if the voltage detected by the transmission oil temperature sensor is higher than the predetermined value.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 9 V
Vehicle speed (calculated from measured secondary pulley shaft speed)	≥6.3 MPH
Above condition satisfied for	≥ 50 s

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured Transmission fluid temperature sensor input voltage	> 4.507 V
(Transmission fluid temperature)	(< - 52 degC)

Time needed for diagnosis: 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect short circuit to power supply or open circuit of the transmission oil temperature sensor 5 V system.
- Judge as NG if the voltage detected by the transmission oil temperature sensor is higher than the predetermined value.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	$\geq 9 \text{ V}$
Vehicle speed (calculated from measured output shaft speed)	$\geq 6.3 \text{ MPH}$
Above condition satisfied for	$\geq 50 \text{ s}$

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured Transmission fluid temperature sensor input voltage	$> 4.502 \text{ V}$
(Transmission fluid temperature)	$(< - 53 \text{ degC})$

Time needed for diagnosis: 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0716 INPUT/TURBINE SHAFT SPEED SENSOR "A" CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

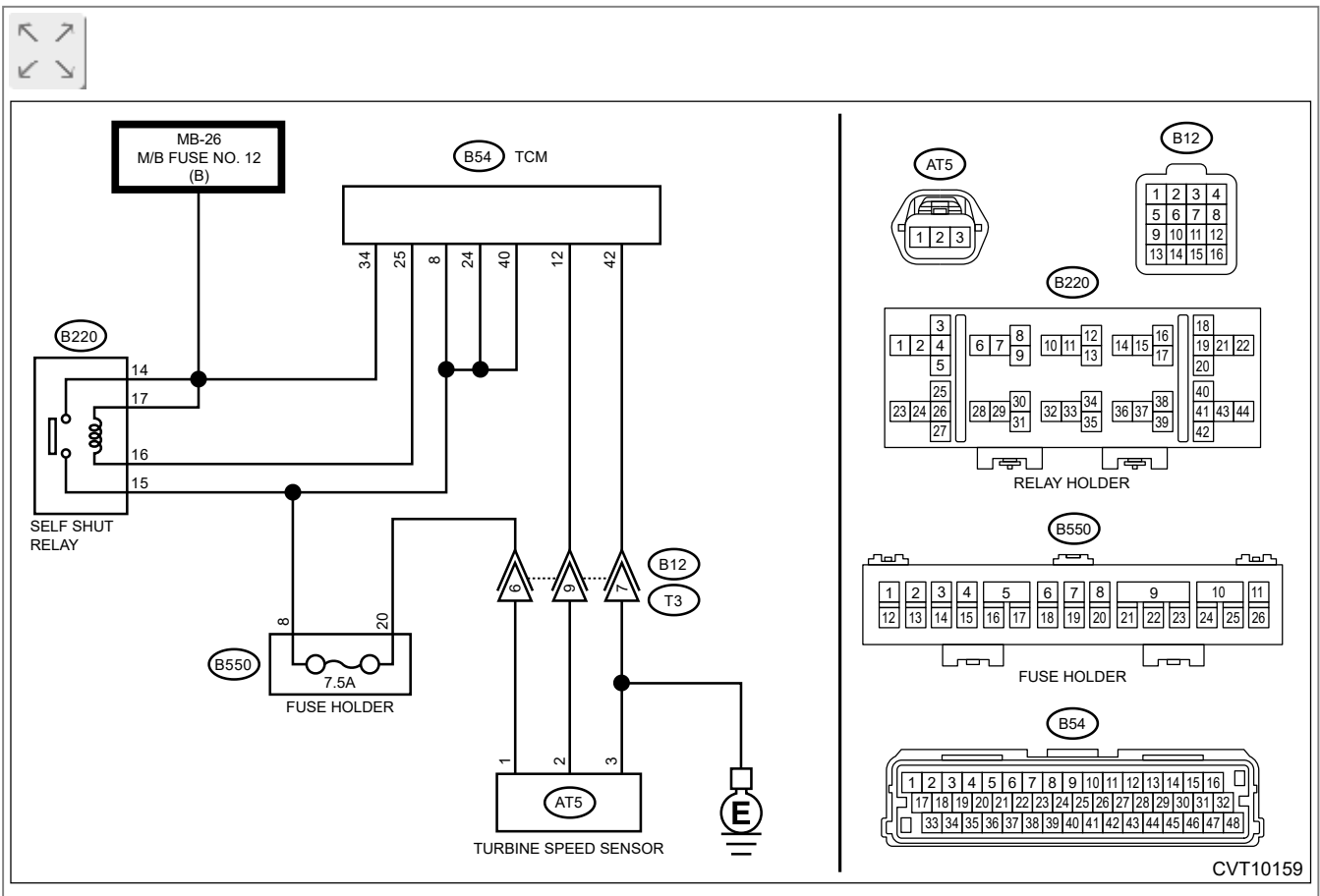
- Standing start problems
- Shock occurs when selecting shift position.

Caution:

Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

Wiring diagram:

CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)




1. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Remove the fuse (7.5 A) from the fuse holder.
3. Check the fuse.

Is the check result OK?



Yes

 [Go to 2.](#)

No

Replace the fuse. If the fuse blows out easily, repair the short circuit of harness.

2. CHECK HARNESS.



1. Disconnect the TCM connector.
2. Remove the self shut relay.
3. Measure the resistance between TCM connector and relay holder.

Connector & terminal

(B54) No. 25 — (B220) No. 16:


(B54) No. 8 — (B220) No. 15:

(B54) No. 24 — (B220) No. 15:

(B54) No. 40 — (B220) No. 15:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit of harness.

3. CHECK HARNESS.



Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(B54) No. 25 — Chassis ground:

(B54) No. 8 — Chassis ground:

(B54) No. 24 — Chassis ground:

(B54) No. 40 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair the short circuit of harness.

4. CHECK RELAY POWER SUPPLY.



Measure the voltage between relay holder and chassis ground.


Connector & terminal

(B220) No. 14 (+) — Chassis ground (-):

(B220) No. 17 (+) — Chassis ground (—):

Is the voltage 10 V or more?

Yes

 [Go to 5.](#)

No

Repair the open or short circuit of harness.

5. CHECK SELF SHUT RELAY.




Measure the resistance between self shut relay terminals.

Terminals

No. 16 — No. 17:

Is the resistance 110 — 140 Ω ?

Yes

 [Go to 6.](#)

No

Replace the self shut relay.

6. CHECK SELF SHUT RELAY.



Measure the resistance between self shut relay terminals.

Terminals

No. 14 — No. 15:

Is the resistance 1 M Ω or more?

Yes

 [Go to 7.](#)

No

Replace the self shut relay.

7. CHECK INPUT SIGNAL FOR TCM.



1. Connect the TCM connector.
2. Install the self shut relay.
3. Read the data of [Control Module Voltage] using Subaru Select Monitor.


Is [Control Module Voltage] 10 V or more?

Yes

Current condition is normal. Check for poor contact in connectors or harnesses,

and repair the defective part.

No

 [Go to 8.](#)

8. CHECK HARNESS.



1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Measure the resistance between TCM connector and transmission connectors.

Connector & terminal


(B54) No. 12 — (B12) No. 9:

(B54) No. 42 — (B12) No. 7:

(B550) No. 20 — (B12) No. 6:

Is the resistance less than 1 Ω ?

Yes

 [Go to 9.](#)

No

Repair the open circuit of harness.

9. CHECK HARNESS.




Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(B54) No. 12 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 10.](#)

No

Repair the short circuit of harness.

10. CHECK HARNESS.



Measure the resistance between relay holder and fuse holder.

Connector & terminal

(B220) No. 15 — (B550) No. 8:

Is the resistance less than 1 Ω ?

 [Go to 11.](#)

Yes

No

Repair the open circuit of harness.

11. CHECK TRANSMISSION HARNESS.


1. Install the fuse.
2. Connect the TCM connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between transmission connector terminals.

Connector & terminal

(B12) No. 6 (+) — Chassis ground (-):

Is the voltage 10 — 13 V?

Yes

 [Go to 12.](#)

No

Repair the open circuit of harness or poor contact of connector.

12. CHECK INPUT SIGNAL FOR TCM.


1. Turn the ignition switch to OFF.
2. Connect the transmission connector.
3. Lift up the vehicle.
4. Start the engine.
5. Read the data of [Turbine Revolution Speed] using Subaru Select Monitor.

Does the value of [Turbine Revolution Speed] change according to the engine speed?

Yes

Current condition is normal. Repair the poor contacts of harnesses of turbine speed sensor and transmission connector.

No

 [Go to 13.](#)

13. CHECK TRANSMISSION HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the transmission connector.
3. Disconnect the turbine speed sensor connector.
4. Measure the resistance between transmission connector and turbine speed sensor connector.

Connector & terminal


(T3) No. 6 – (AT5) No. 1:

(T3) No. 7 – (AT5) No. 3:

(T3) No. 9 – (AT5) No. 2:

Is the resistance less than 1 Ω ?

Yes

 [Go to 14.](#)

No

Replace the transmission harness.

14. CHECK TURBINE SPEED SENSOR HARNESS.

Measure the resistance between transmission connector and chassis ground.


Connector & terminal

(T3) No. 6 – Chassis ground:

(T3) No. 9 – Chassis ground:

Is the resistance 1 M Ω or more?



Yes

 [Go to 15.](#)

No


Repair the short circuit of harness.

15. CHECK TURBINE SPEED SENSOR.

1. Turn the ignition switch to OFF.
2. Replace the turbine speed sensor.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Turbine Speed Sensor.](#)
3. Clear the memory.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Clear memory.](#)
4. Read the DTC.

Is DTC P0716 displayed?

Yes


 [Go to 16.](#)

No

The original turbine speed sensor is defective.


16. CHECK SELF SHUT RELAY.

1. Turn the ignition switch to OFF.

2. Replace the self shut relay.
3. Clear the memory.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Clear memory.](#)
4. Read the DTC.

Is DTC P0716 displayed?

Yes

Replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)

No

The original self shut relay is defective.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of turbine speed sensor characteristics.
- Judge as NG if the turbine speed against the engine speed is outside the possible range considering the hardware capabilities.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Engine speed	≥ 400 rpm

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured turbine shaft speed	< Table 1 rpm

Table 1

Engine speed (rpm)	3700	3227	2755	2282	1856	1519	1213	956
Measured turbine shaft speed (rpm)	0	500	1000	1500	2000	2500	3000	3500

Engine speed (rpm)	786	713	651	601	569	544	520
Measured turbine shaft speed (rpm)	4000	4500	5000	5500	6000	6500	7000

Time needed for diagnosis: 10 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0717 INPUT/TURBINE SHAFT SPEED SENSOR "A" CIRCUIT NO SIGNAL

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- No lock-up occurs.
- Shock occurs when selecting shift position.
- Shift control malfunction

1. CHECK DTC.

Read the DTC using Subaru Select Monitor.

Besides DTC P0717, is DTC P0500 displayed?

Yes

Perform the diagnosis according to DTCs other than P0717.

No

Perform the diagnosis according to DTC P0716. [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0716 INPUT/TURBINE SHAFT SPEED SENSOR "A" CIRCUIT RANGE/PERFORMANCE.](#)

1. OUTLINE OF DIAGNOSIS

- Detect the no input signal from the turbine speed sensor.
- Judge as NG if there is no input signal from the turbine speed sensor, while the primary speed sensor on the same shaft has the input signal with the forward/reverse clutch engaged.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Engine speed	≥ 400 rpm
Transmission range	Drive or Reverse
Measured primary pulley shaft speed	≥ 500 rpm

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured turbine shaft speed	0 rpm

Time needed for diagnosis: 0.6 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0719 BRAKE SWITCH "B" CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition


Trouble symptom:

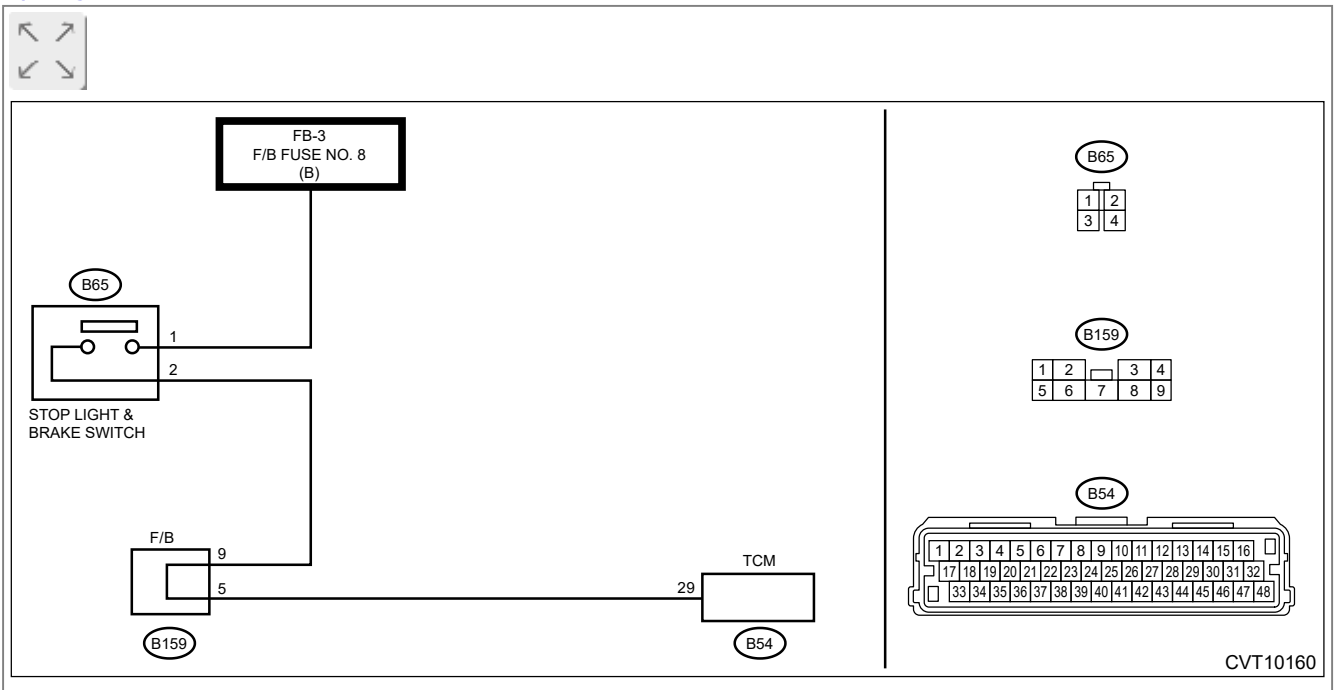
Gear is not shifted down when climbing a hill or driving down a hill.


Caution:

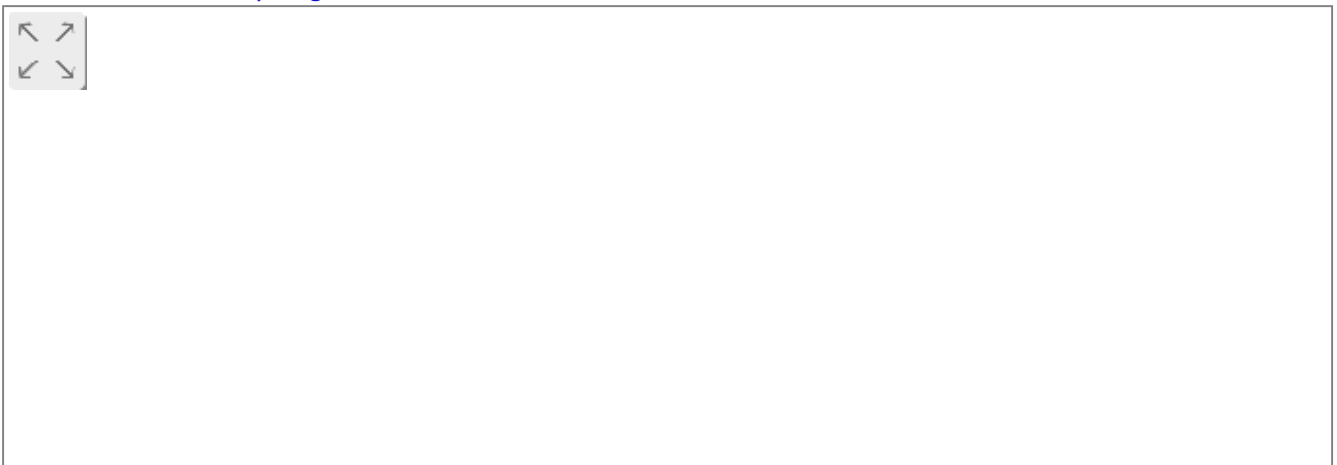
Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

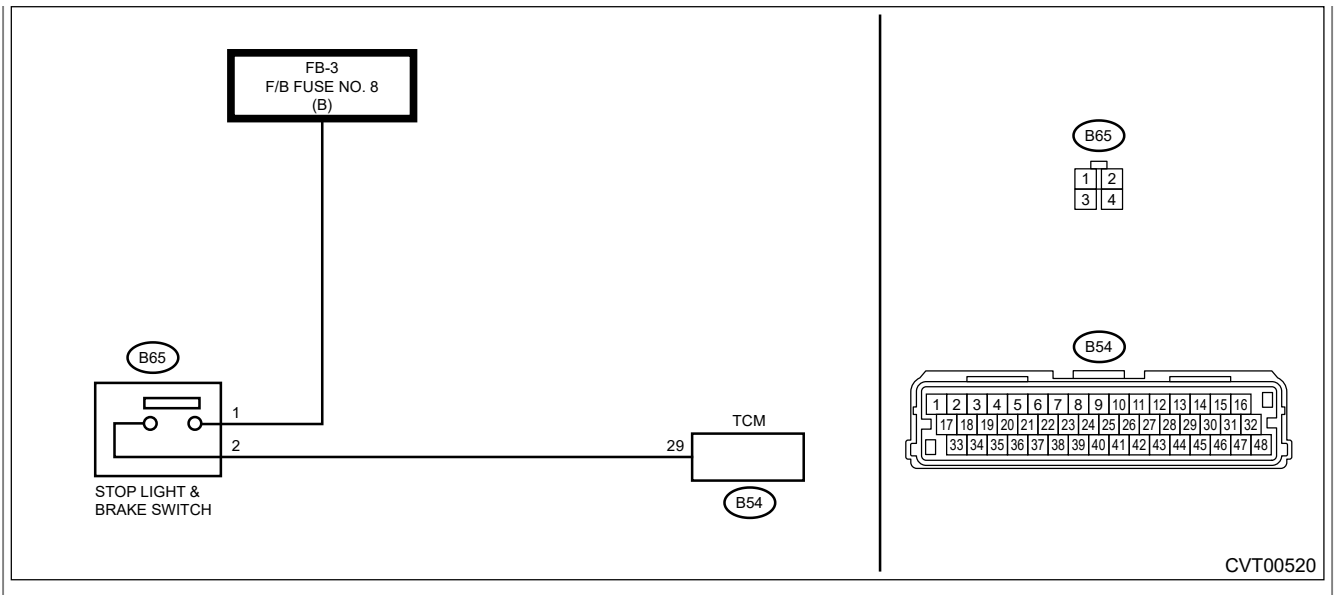
Wiring diagram:

- Non-turbo model (without EyeSight and X mode)
Stop light system  [Ref. to WIRING SYSTEM>Stop Light System>WIRING DIAGRAM > WITHOUT EyeSight AND X MODE.](#)



- Except for non-turbo model (without EyeSight and X mode)
Stop light system  [Ref. to WIRING SYSTEM>Stop Light System>WIRING DIAGRAM > EXCEPT FOR MODEL WITHOUT EyeSight AND X MODE.](#)





1. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Remove the fuse (No. 8).
3. Check the fuse.

Is the check result OK?

Yes

[Go to 2.](#)

No

Replace the fuse (No. 8). If the new fuse (No. 8) has blown out easily, repair the short circuit of harness between fuse (No. 8) and stop light switch.

2. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the stop light switch connector.
4. Measure the resistance between TCM connector and stop light switch connector.

Connector & terminal

(B54) No. 29 — (B65) No. 2:

Is the resistance less than 1 Ω ?

Yes

[Go to 3.](#)

No

Repair the open circuit of harness.

3. CHECK HARNESS.



Measure the resistance between the stop light switch connector and fuse (No. 8).

Connector & terminal

(B65) No. 1 — fuse (No. 8):

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Repair the open circuit of harness.

4. CHECK INPUT SIGNAL FOR TCM.



1. Install the fuse (No. 8).
2. Connect the stop light switch connector.
3. Depress the brake pedal.
4. Measure the voltage between TCM connector and chassis ground.

Connector & terminal

(B54) No. 29 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 5.](#)

No

Replace the stop light switch.  [Ref. to BRAKE>Stop Light Switch.](#)

5. CHECK INPUT SIGNAL FOR TCM.




1. Connect the TCM connector.
2. With brake pedal depressed, read the data of [Stop Light Switch] using Subaru Select Monitor.

Is "ON" displayed?

Yes

Current condition is normal. Check for poor contact in connectors or harnesses, and repair the defective part.

No

 [Go to 6.](#)

6. CHECK FOR POOR CONTACT.





Is there poor contact in the input signal circuit of stop light switch?

Yes

Repair the poor contact.

No

Replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

1. OUTLINE OF DIAGNOSIS

- Detect no input from the brake signal.
- Judge as NG if a predetermined number of deceleration occurs while the cruise control is set to OFF and the brake is OFF.

2. EXECUTION CONDITION

Models with EyeSight

Secondary Parameters	Execution condition
EyeSight adaptive cruise control	OFF

Models without EyeSight

Secondary Parameters	Execution condition
None	

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Number of times that vehicle speed changes from 30 km/h to 1 km/h while the brake SW is OFF	> 10 count

Time needed for diagnosis: Immediately

Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0720 OUTPUT SHAFT SPEED SENSOR CIRCUIT

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

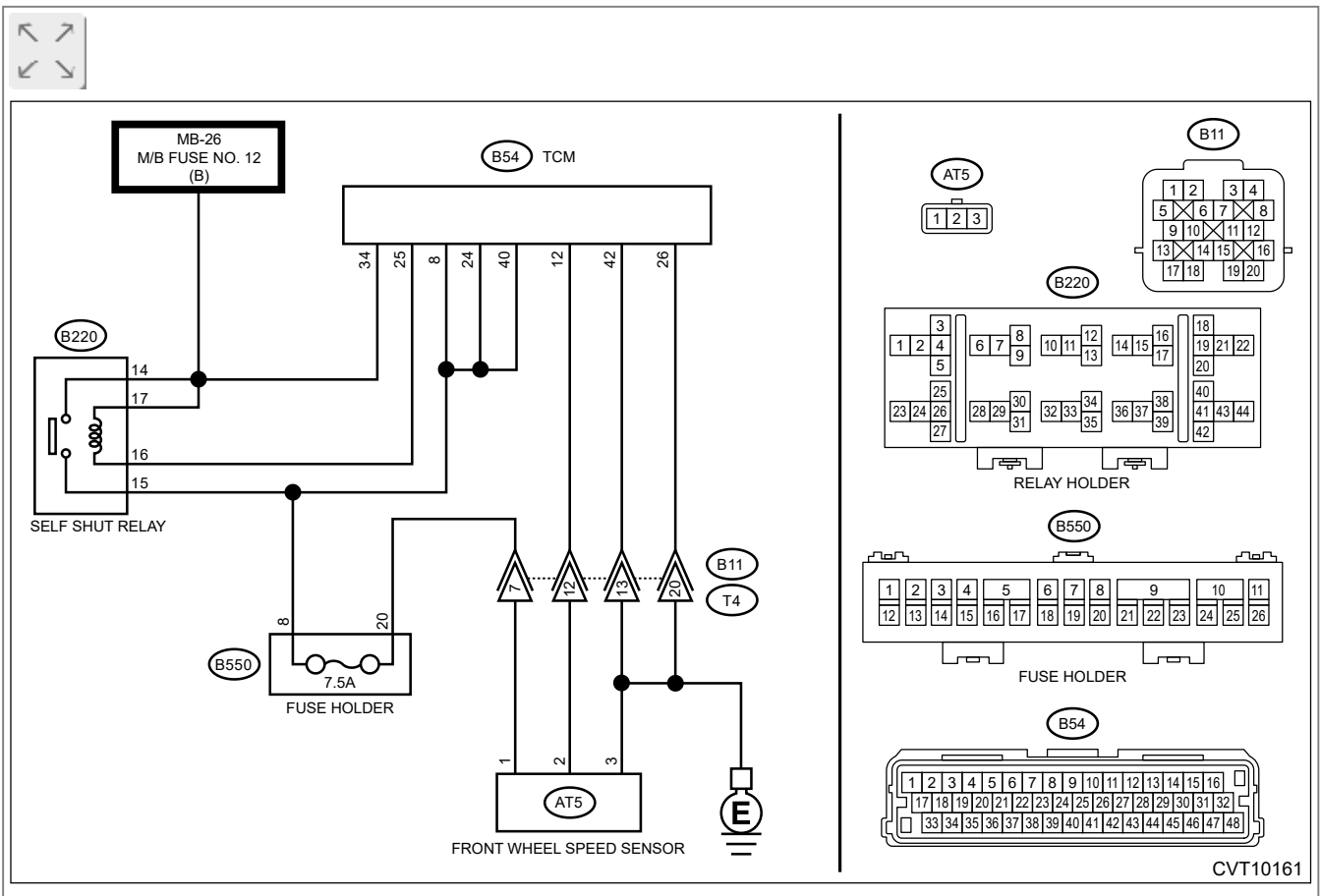
- Shock occurs when selecting shift position.
- Shift control malfunction

Caution:

Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

Wiring diagram:

CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)




1. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Remove the fuse (7.5 A) from the fuse holder.
3. Check the fuse.

Is the check result OK?



Yes

 [Go to 2.](#)

No

Replace the fuse. If the fuse blows out easily, repair the short circuit of harness.

2. CHECK HARNESS.



1. Disconnect the TCM connector.
2. Remove the self shut relay.
3. Measure the resistance between TCM connector and relay holder.

Connector & terminal

(B54) No. 25 — (B220) No. 16:


(B54) No. 8 — (B220) No. 15:

(B54) No. 24 — (B220) No. 15:

(B54) No. 40 — (B220) No. 15:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit of harness.

3. CHECK HARNESS.



Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(B54) No. 25 — Chassis ground:


(B54) No. 8 — Chassis ground:

(B54) No. 24 — Chassis ground:

(B54) No. 40 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair the short circuit of harness.

4. CHECK RELAY POWER SUPPLY.



Measure the voltage between relay holder and chassis ground.


Connector & terminal

(B220) No. 14 (+) — Chassis ground (-):

(B220) No. 17 (+) — Chassis ground (—):

Is the voltage 10 V or more?

Yes

 [Go to 5.](#)

No

Repair the open or short circuit of harness.

5. CHECK SELF SHUT RELAY.




Measure the resistance between self shut relay terminals.

Terminals

No. 16 — No. 17:

Is the resistance 110 — 140 Ω ?

Yes

 [Go to 6.](#)

No

Replace the self shut relay.

6. CHECK SELF SHUT RELAY.



Measure the resistance between self shut relay terminals.

Terminals

No. 14 — No. 15:

Is the resistance 1 M Ω or more?

Yes

 [Go to 7.](#)

No

Replace the self shut relay.

7. CHECK INPUT SIGNAL FOR TCM.



1. Connect the TCM connector.
2. Install the self shut relay.
3. Read the data of [Control Module Voltage] using Subaru Select Monitor.

Is [Control Module Voltage] 10 V or more?

Yes

Current condition is normal. Check for poor contact in connectors or harnesses,

and repair the defective part.

No

 [Go to 8.](#)

8. CHECK HARNESS.



1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Measure the resistance between TCM connector and transmission connectors.

Connector & terminal

(B54) No. 12 — (B11) No. 12:


(B54) No. 26 — (B11) No. 20:

(B54) No. 42 — (B11) No. 13:

(B550) No. 20 — (B11) No. 7:

Is the resistance less than 1 Ω ?

Yes

 [Go to 9.](#)

No

Repair the open circuit of harness.

9. CHECK HARNESS.




Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(B54) No. 12 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 10.](#)

No

Repair the short circuit of harness.

10. CHECK HARNESS.




Measure the resistance between relay holder and fuse holder.

Connector & terminal

(B220) No. 15 — (B550) No. 8:

Is the resistance less than 1 Ω ?

Yes

 [Go to 11.](#)

No

Repair the open circuit of harness.

11. CHECK TRANSMISSION HARNESS.


1. Install the fuse.
2. Connect the TCM connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between transmission connector terminals.

Connector & terminal

(B11) No. 7 (+) — Chassis ground (-):

Is the voltage approx. 10 — 13 V?

Yes

 [Go to 12.](#)

No

Repair the open circuit of harness or poor contact of connector.

12. CHECK INPUT SIGNAL FOR TCM.

1. Turn the ignition switch to OFF.
2. Connect the transmission connector.
3. Lift up the vehicle.
4. Start the engine.
5. Slowly increase the speed to 30 km/h (19 MPH).
6. Read the data of [Front Wheel Speed] using Subaru Select Monitor.

Does the value of [Front Wheel Speed] change according to the engine speed?

Yes

Current condition is normal. Repair the poor contacts of harnesses of front wheel speed sensor and transmission connector.

No

 [Go to 13.](#)

13. CHECK TRANSMISSION HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the transmission connector.
3. Disconnect the front wheel speed sensor connector.
4. Measure the resistance between transmission connector and front wheel speed sensor


connector.

Connector & terminal

- (T4) No. 7 — (AT5) No. 1:
- (T4) No. 12 — (AT5) No. 2:
- (T4) No. 13 — (AT5) No. 3:
- (T4) No. 20 — (AT5) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 14.](#)

No

Replace the transmission harness.

14. CHECK FRONT WHEEL SPEED SENSOR HARNESS.


Measure the resistance between transmission connector and chassis ground.

Connector & terminal

- (T4) No. 7 — Chassis ground:
- (T4) No. 12 — Chassis ground:

Is the resistance 1 M Ω or more?



Yes

 [Go to 15.](#)

No


Repair the short circuit of harness.

15. CHECK FRONT WHEEL SPEED SENSOR.

1. Turn the ignition switch to OFF.
2. Replace the front wheel speed sensor.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Front Wheel Speed Sensor.](#)
3. Clear the memory.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Clear memory.](#)
4. Read the DTC.

Is DTC P0720 displayed?

Yes

 [Go to 16.](#)

No


The original front wheel speed sensor is defective.

16. CHECK SELF SHUT RELAY.

1. Turn the ignition switch to OFF.
2. Replace the self shut relay.
3. Clear the memory.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Clear memory.](#)
4. Read the DTC.

Is DTC P0720 displayed?

Yes

Replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

The original self shut relay is defective.

1. OUTLINE OF DIAGNOSIS

- Detect no input signal from the front wheel speed sensor.
- Judge as NG if there is no output from the front wheel speed sensor while the forward/reverse clutch is engaged and the wheel speed from VDC is equal to or higher than the predetermined value.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Vehicle speed (from vehicle dynamics control module)	≥ 3 MPH
Transmission range	Drive or Reverse

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured front output shaft speed	0 rpm

Time needed for diagnosis: 0.5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0721 OUTPUT SHAFT SPEED SENSOR CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Acceleration is poor during standing start.
- No lock-up occurs.
- The engine stalls when the vehicle is stopped.
- Shift control malfunction

1. CHECK DTC. ▼

Read the DTC using Subaru Select Monitor.

Besides DTC P0721, is DTC P0500 displayed?

Perform the diagnosis according to DTCs other than P0721.

Perform the diagnosis according to DTC P0720. [🔗 Ref. to TRANSMISSION \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0720 OUTPUT SHAFT SPEED SENSOR CIRCUIT.](#)

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of front wheel speed sensor characteristics.
- Judge as NG when the deviation between vehicle speed from VDC and front wheel speed sensor becomes equal to or larger than the predetermined value.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Vehicle speed (from vehicle dynamics control module)	≥ 12 MPH

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Vehicle speed (calculated from front output shaft speed) – Vehicle speed (from vehicle dynamics control module)	> 10 MPH

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0724 BRAKE SWITCH "B" CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition


Trouble symptom:

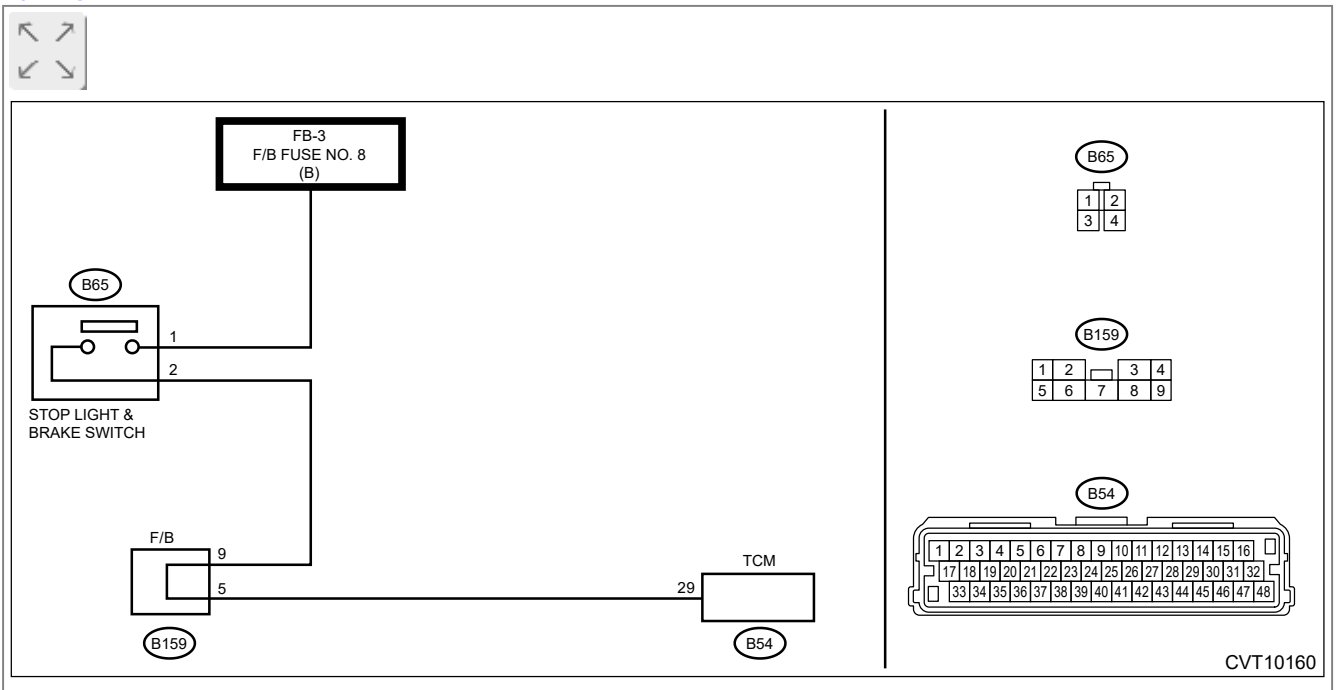
Gear is not shifted down when climbing a hill or driving down a hill.


Caution:

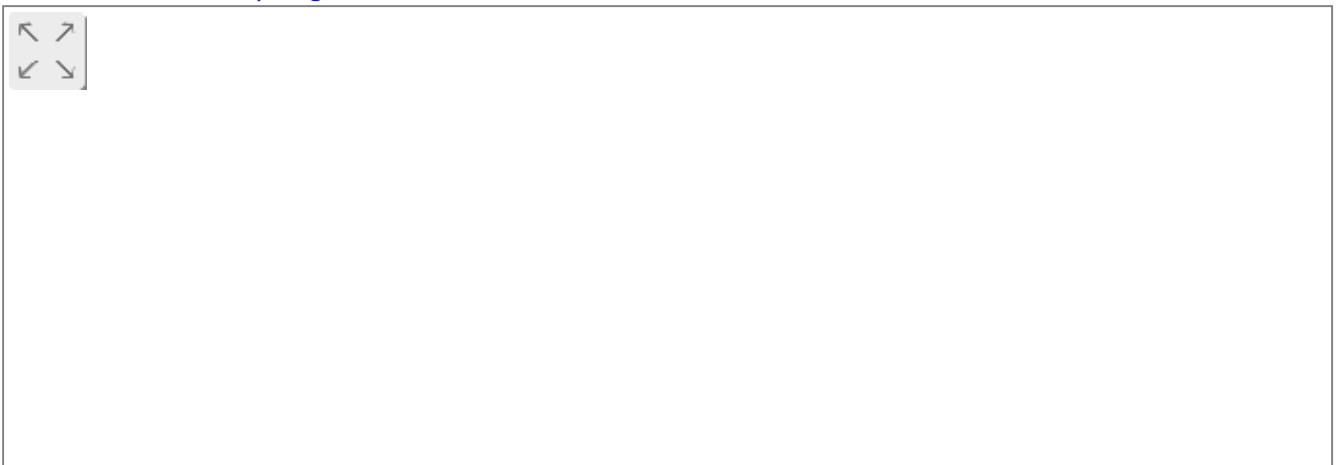
Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

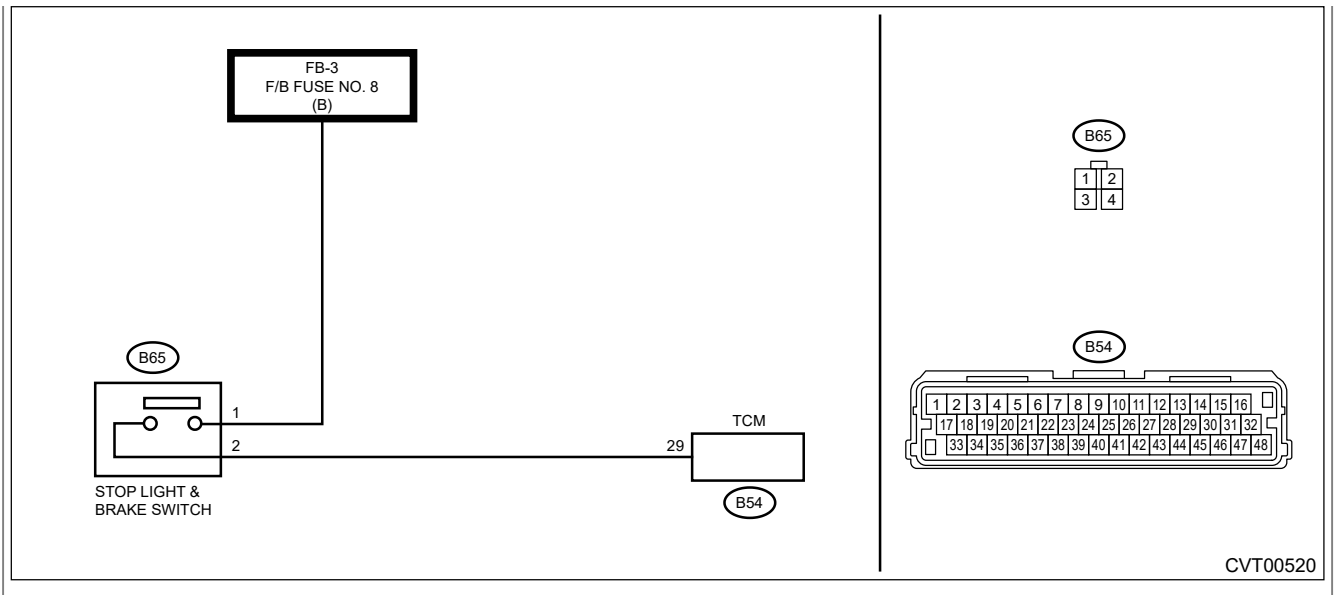
Wiring diagram:

- Non-turbo model (without EyeSight and X mode)
Stop light system  [Ref. to WIRING SYSTEM>Stop Light System>WIRING DIAGRAM > WITHOUT EyeSight AND X MODE.](#)



- Except for non-turbo model (without EyeSight and X mode)
Stop light system  [Ref. to WIRING SYSTEM>Stop Light System>WIRING DIAGRAM > EXCEPT FOR MODEL WITHOUT EyeSight AND X MODE.](#)





CVT00520

1. CHECK STOP LIGHT SWITCH. ▼

1. Turn the ignition switch to OFF.
2. Disconnect the stop light switch connector.
3. Measure the resistance between stop light switch.

Terminals

No. 1 — No. 2:

Is the resistance 1 MΩ or more?

Yes

[Go to 2.](#)

No

Replace the stop light switch. [Ref. to BRAKE>Stop Light Switch.](#)

2. CHECK HARNESS. ▼

1. Disconnect the TCM connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between TCM connector and chassis ground.

Connector & terminal

(B54) No. 29 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

Repair the short circuit of harness.

No

[Go to 3.](#)

3. CHECK INPUT SIGNAL FOR TCM.


1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Read the data of [Stop Light Switch] using Subaru Select Monitor.

Is "OFF" displayed?

Yes

Current condition is normal. Check for poor contact in connectors or harnesses, and repair the defective part.

No

 [Go to 4.](#)



4. CHECK FOR POOR CONTACT.

Is there poor contact in the input signal circuit of stop light switch?

Yes

Repair the poor contact.

No

Replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

1. OUTLINE OF DIAGNOSIS

- Detect the brake signal stuck to ON.
- Judge as NG if a predetermined number of acceleration occurs while the cruise control is set to OFF and the brake is ON.

2. EXECUTION CONDITION

Models with EyeSight

Secondary Parameters	Execution condition
EyeSight adaptive cruise control	OFF

Models without EyeSight

Secondary Parameters	Execution condition
None	

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

--	--

Malfunction Criteria	Threshold Value
Number of times that vehicle speed changes from 1 km/h to 30 km/h while the brake SW is ON	> 10 count

Time needed for diagnosis:Immediately

Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0730 INCORRECT GEAR RATIO

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Acceleration is poor during standing start.
- Shift control malfunction
- Engine speed increases abruptly.

1. CHECK TRANSMISSION FLUID.

Check the amount of ATF. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>ADJUSTMENT.](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>ADJUSTMENT.](#)

Is the check result OK?

Yes

[Go to 2.](#)

No

Adjust the amount of ATF. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>ADJUSTMENT.](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>ADJUSTMENT.](#)

2. CHECK TRANSMISSION FLUID.

Check the condition of ATF. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>CONDITION CHECK.](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>CONDITION CHECK.](#)

Is the check result OK?

Yes

[Go to 3.](#)

No

Check according to the "Corrective action" of ATF (CVTF) "CONDITION CHECK". [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>CONDITION CHECK.](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>CONDITION CHECK.](#)


3. CHECK INPUT SIGNAL FOR TCM.

1. Lift up the vehicle.


2. Start the engine.
3. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
4. Depress the brake pedal, and shift the select lever to "D" range.
5. Shift the select lever to "P" range.
6. Stabilize the engine speed at idle.
7. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor.

Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes

 [Go to 4.](#)

No

Perform the diagnosis according to DTC P0841.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0841 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT RANGE/PERFORMANCE.](#)

4. CHECK INPUT SIGNAL FOR TCM.

1. Set the select lever to "D" range.
2. Release the brake pedal to stabilize the engine speed and front wheel speed.
3. Read the data of [Actual Gear Ratio] using Subaru Select Monitor.

Is [Actual Gear Ratio] as follows?

- Non-turbo model
1.5 — 2.6
- Turbo model
2.0 — 2.4

Yes

 [Go to 5.](#)

No

 [Go to 6.](#)


5. CHECK INPUT SIGNAL FOR TCM.

1. Set the select lever to "D" range.
2. Slowly increase the speed to 40 km/h (25 MPH) and keep the constant speed.
3. Read the data of [Actual Gear Ratio] using Subaru Select Monitor.



Is [Actual Gear Ratio] as follows?

- Non-turbo model
0.5 — 0.9
- Turbo model
0.5 — 0.8


Yes

 [Go to 6.](#)

No



Replace the transmission assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

6. DRIVING CHECK BY INSPECTION MODE.

1. Turn the ignition switch to OFF.
2. Perform a drive check based on the "Inspection Mode".  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Inspection Mode.](#)

Does the AT OIL TEMP light blink and is DTC P0730 displayed?

Yes

Replace the transmission assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

No

Current condition is normal. It is possible that temporary poor contact occurs.

1. OUTLINE OF DIAGNOSIS

- Detect the abnormality in transmission gear ratio control function.
- Judge as NG if the discrepancy between the transmission target gear ratio (as internal data) and the actual gear ratio becomes the specified value or more. (Compare the value of "Gear Ratio Target × Secondary pulley speed ≈ Target primary speed equivalent value" with the value of primary pulley speed sensor.)

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Engine speed	≥ 400 rpm
Transmission range	Drive

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Target primary pulley shaft speed – Measured primary pulley shaft speed	≥ 600 rpm

(Commanded duty of shift up pressure control solenoid	≥ 90%
or	
Commanded duty of shift down pressure control solenoid)	≥ 90%

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0746 PRESSURE CONTROL SOLENOID "A" PERFORMANCE/STUCK OFF

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

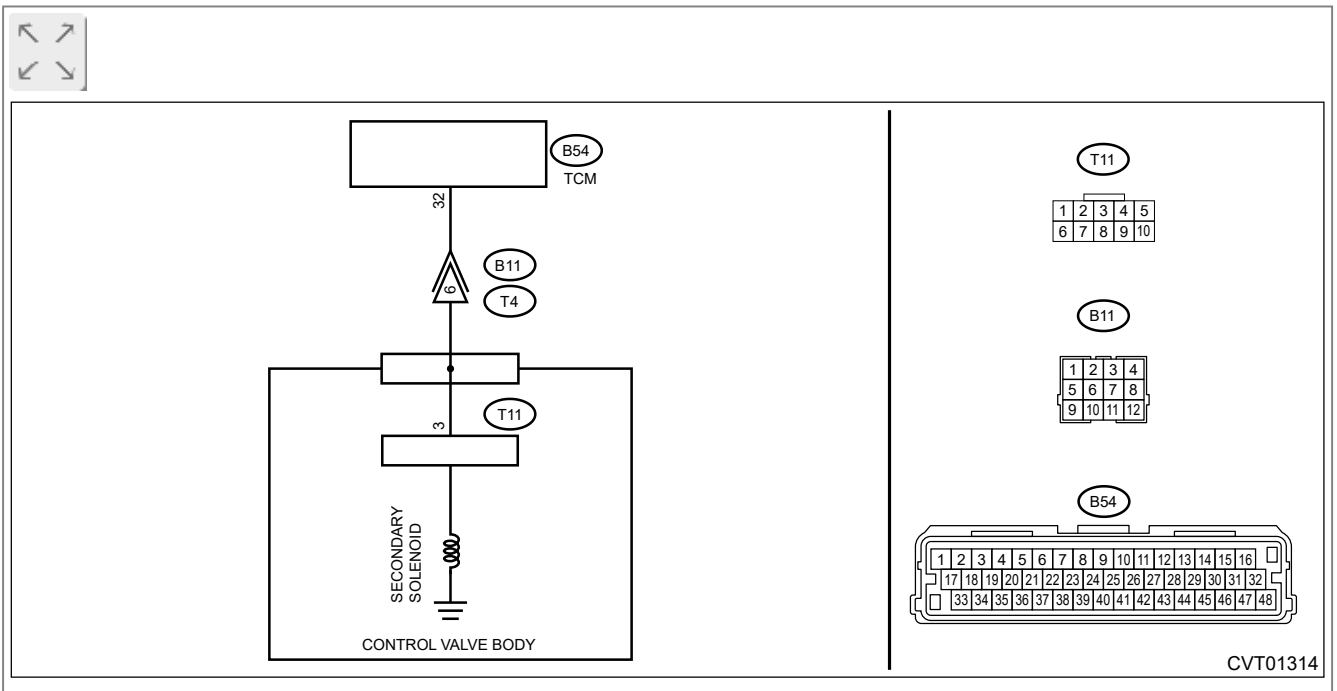
Trouble symptom:

- Shift control malfunction
- CVT chain slippage

Wiring diagram:

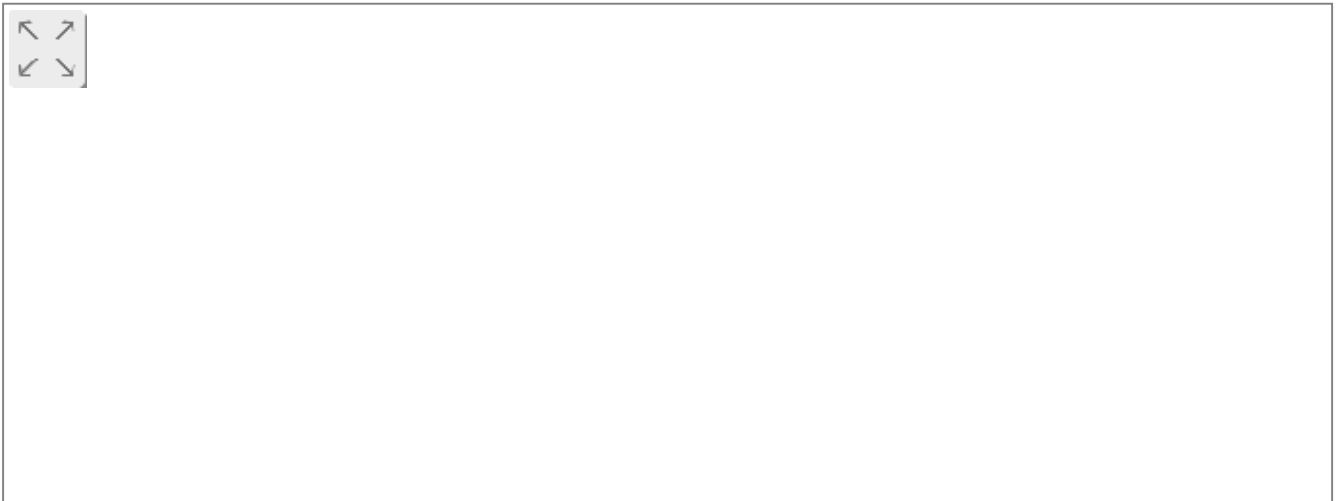
- Non-turbo model

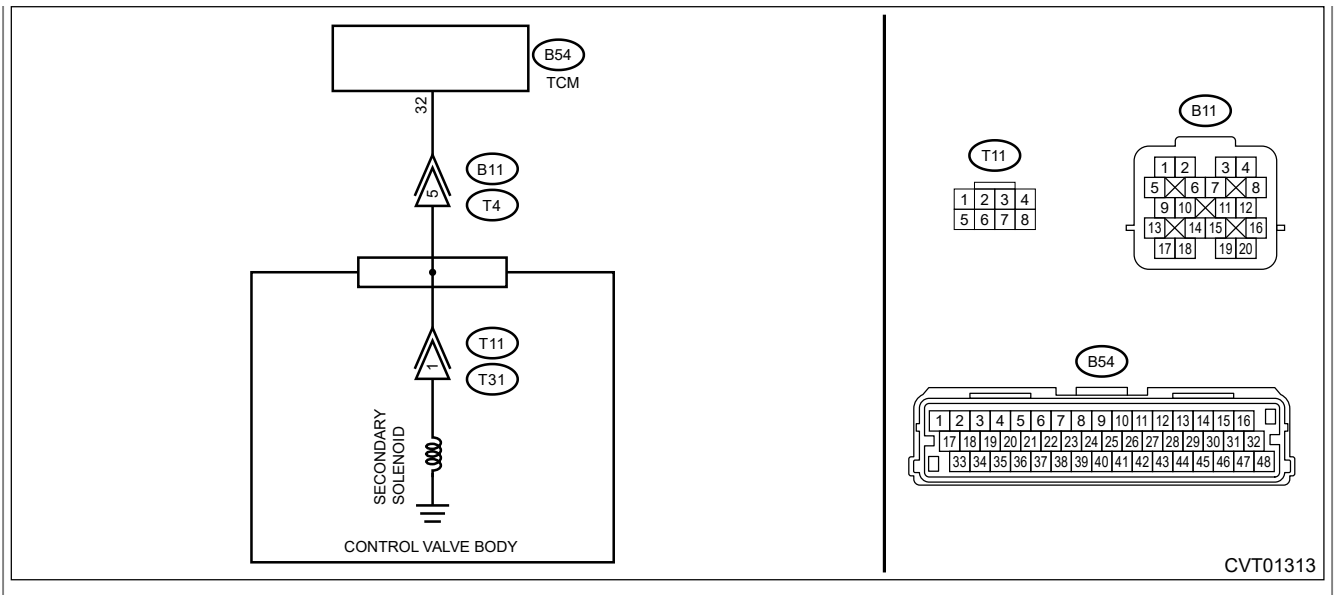
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model

CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK DTC.

Read the DTC using Subaru Select Monitor.

Besides DTC P0746, is any of the DTCs P0842, P0843, P0962 and P0963 displayed?

Yes

Perform the diagnosis according to DTCs other than P0746.

No

[Go to 2.](#)

2. CHECK SECONDARY SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform forced operation of the secondary solenoid. [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Active Test.](#)

Does the indication of 0 → 500 mA appear repeatedly during forced operation, and does operating sound emit during indicating 500 mA?

Yes

[Go to 5.](#)

No

[Go to 3.](#)

3. CHECK SECONDARY SOLENOID.

1. Turn the ignition switch to OFF.

2. Disconnect the transmission connector.
3. Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model

(T4) No. 6 — Transmission body:

Turbo model

(T4) No. 5 — Transmission body:

Is the resistance approximately 5 — 7 Ω ? (when cold)

Yes

 [Go to 7.](#)

No

 [Go to 4.](#)

4. CHECK HARNESS.



Check the transmission harness. (Open circuit, short circuit to power supply, short circuit to ground, and poor contact)

Is the check result OK?

Yes



 [Go to 7.](#)

No

Repair the harness.

5. CHECK TRANSMISSION FLUID.





1. Connect the transmission connector.
2. Check the amount of ATF.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>ADJUSTMENT.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>ADJUSTMENT.](#)

Is the check result OK?

Yes

 [Go to 6.](#)

No

Adjust the amount of ATF.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>ADJUSTMENT.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>ADJUSTMENT.](#)

6. CHECK TRANSMISSION FLUID.



Check the condition of ATF. [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>CONDITION CHECK.](#) [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>CONDITION CHECK.](#)

Is the check result OK?

Yes

[🔗 Go to 7.](#)

No

Check according to the "Corrective action" of ATF (CVTF) "CONDITION CHECK".
[🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>CONDITION CHECK.](#) [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>CONDITION CHECK.](#)

7. CHECK INPUT SIGNAL FOR TCM.

1. Lift up the vehicle.
2. Start the engine.
3. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
4. Depress the brake pedal, and shift the select lever to "D" range.
5. Shift the select lever to "P" range.
6. Stabilize the engine speed at idle.
7. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor.

Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes

[🔗 Go to 8.](#)

No

Replace the control valve body. [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#) [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

8. CHECK INPUT SIGNAL FOR TCM.

1. Keep the engine speed at 3000 rpm.
2. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor.

Is [Actual Secondary Pressure] higher than that of step 7? Does the value change according to the engine speed? And is the value 1.5 — 2.5 MPa?

Yes

[🔗 Go to 9.](#)

No

Replace the control valve body. [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#) [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

9. CHECK TCM INPUT SIGNAL (STALL TEST).



1. Apply the parking brake.
2. Set the select lever to "D" range.
3. Depress the brake pedal firmly.
4. Slowly open the accelerator fully, and stabilize the engine speed.
5. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor.

Caution:

Do not perform a stall test for over 5 seconds at a time.

Is [Actual Secondary Pressure] higher than that of step 8? Does the value change according to the engine speed? And is the value 4.5 – 6.0 MPa?

Yes

[Go to 10.](#)

No

Replace the control valve body. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

10. DRIVING CHECK BY INSPECTION MODE.



1. Turn the ignition switch to OFF.
2. Perform a drive check based on the "Inspection Mode". [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Inspection Mode.](#)

Does the AT OIL TEMP light blink and is DTC P0746 displayed?

Yes

Perform the secondary pressure test. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Secondary Pressure \(Line Pressure\) Test.](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Secondary Pressure \(Line Pressure\) Test.](#)

No

Current condition is normal. It is possible that temporary poor contact occurs.

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect the malfunction of transmission line pressure solenoid and hydraulic circuit (stuck to low pressure side).
- Judge as NG if the target line pressure – actual line pressure becomes the predetermined value or more, while the actual line pressure is equal to or more than the predetermined value.

2. EXECUTION CONDITION (NON-TURBO MODEL)

--	--

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Engine speed	≥ 1000 rpm
Measured line pressure control solenoid valve current	≤0.78 A

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured line pressure	< Map 1 kPa

Map 1

		Engine speed (rpm)						
		0	500	1000	1500	2000	2500	3000
Transmission fluid temperature (degC)	- 40	0	0	340	404	478	558	643
	- 20	0	0	340	404	478	558	643
	0	0	0	324	382	454	532	616
	20	0	0	366	425	490	565	649
	40	0	0	345	400	466	536	613
	60	0	0	341	389	447	512	591
	80	0	0	319	371	429	488	571
	100	0	0	298	356	412	476	551
	120	0	0	271	329	384	451	519
140	0	0	243	302	357	425	487	

		Engine speed (rpm)						
		3500	4000	4500	5000	5500	6000	6500
Transmission fluid temperature (degC)	- 40	751	883	1042	1167	1264	1292	1274
	- 20	751	883	1042	1167	1264	1342	1424
	0	722	840	991	1135	1240	1319	1395
	20	751	861	1000	1160	1258	1350	1417
	40	708	817	943	1103	1223	1312	1385
	60	677	779	906	1064	1187	1266	1339
	80	652	748	874	1000	1135	1223	1299
	100	629	719	831	947	1069	1181	1251
	120	593	678	780	880	990	1109	1171
140	557	637	728	813	911	1037	1090	

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect the malfunction of transmission line pressure solenoid and hydraulic circuit (stuck to low pressure side).
- Judge as NG if “Target line pressure – Actual line pressure” becomes the predetermined value or more, while the actual line pressure is equal to or more than the predetermined value.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Engine speed	≥ 1000 rpm
Measured line pressure control solenoid valve current	≤ 0.75 A

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured line pressure	< Map 2 kPa

Map 2: Command of the torque converter clutch circuit control solenoid output = ON

		Engine speed (rpm)						
		0	500	1000	1500	2000	2500	3000
Transmission fluid temperature (degC)	- 40	0	0	490	577	681	783	884
	- 20	0	0	490	577	681	783	884
	0	0	0	415	468	533	612	701
	20	0	0	399	454	515	569	642
	40	0	0	381	432	489	552	605
	60	0	0	225	280	338	407	465
	80	0	0	218	279	338	404	472
	100	0	0	195	276	320	381	448
	120	0	0	167	246	298	365	431
	140	0	0	170	252	308	365	436

		Engine speed (rpm)						
		3500	4000	4500	5000	5500	6000	6500
Transmission fluid temperature (degC)	- 40	1010	1114	1191	1273	1359	1419	1448
	- 20	1010	1114	1191	1273	1359	1419	1448
	0	802	933	1073	1183	1282	1374	1424
	20	726	832	965	1128	1257	1370	1459
	40	683	775	890	1039	1200	1318	1411
	60	525	618	728	873	1050	1196	1288
	80	517	599	707	849	1015	1163	1255
	100	509	576	669	796	931	1072	1195
	120	491	543	664	772	874	1000	1110

	140	482	547	635	723	845	947	1074
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Map 2: Command of the torque converter clutch circuit control solenoid output = OFF

		Engine speed (rpm)						
		0	500	1000	1500	2000	2500	3000
Transmission fluid temperature (degC)	- 40	0	0	493	578	690	783	887
	- 20	0	0	493	578	690	783	887
	0	0	0	376	440	517	597	699
	20	0	0	386	452	524	599	687
	40	0	0	359	422	492	566	648
	60	0	0	336	394	459	529	612
	80	0	0	327	386	451	517	601
	100	0	0	312	377	438	503	580
	120	0	0	303	367	430	493	566
	140	0	0	296	367	429	490	563

		Engine speed (rpm)						
		3500	4000	4500	5000	5500	6000	6500
Transmission fluid temperature (degC)	- 40	1020	1117	1196	1286	1378	1439	1477
	- 20	1020	1117	1196	1286	1378	1439	1477
	0	806	954	1099	1201	1301	1412	1498
	20	796	933	1095	1214	1317	1426	1532
	40	744	849	1032	1167	1285	1397	1483
	60	711	805	953	1115	1244	1345	1428
	80	676	779	906	1064	1213	1310	1391
	100	656	750	870	1014	1167	1261	1343
	120	644	728	835	970	1117	1233	1292
	140	638	717	812	928	1063	1182	1257

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0747 PRESSURE CONTROL SOLENOID "A" STUCK ON

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

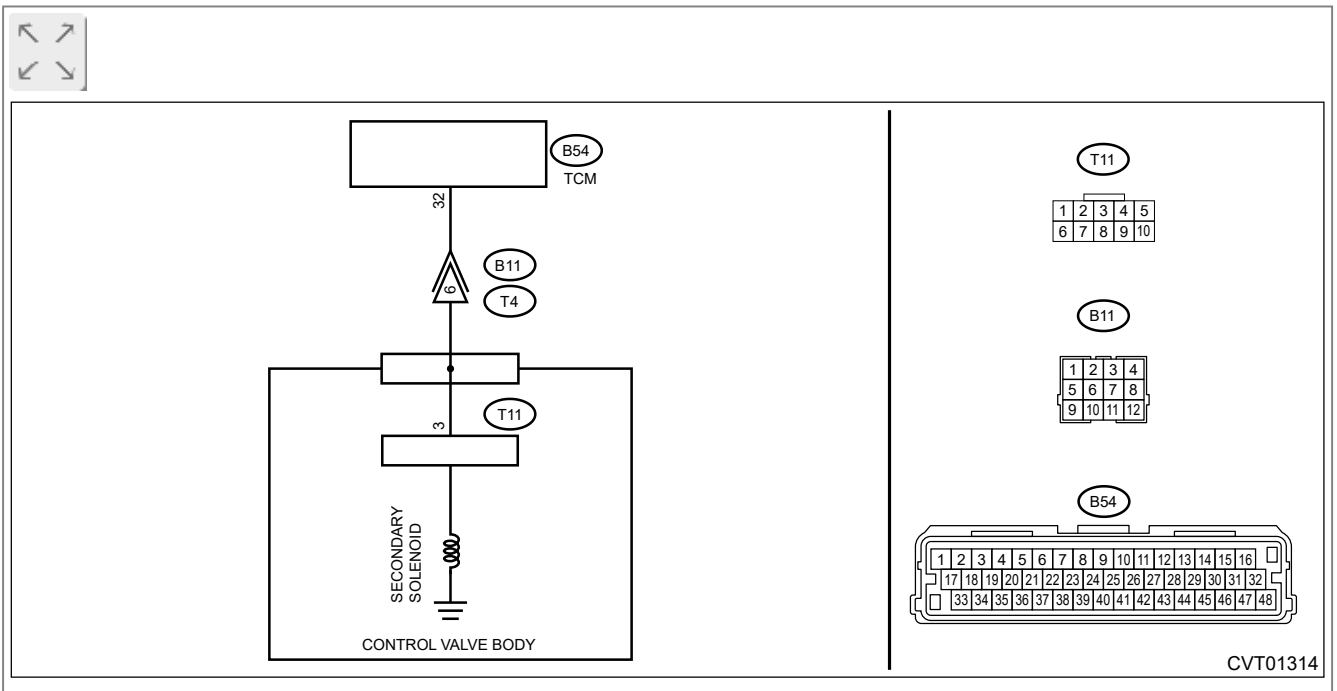
Trouble symptom:

- Acceleration is poor during standing start.
- Shift control malfunction

Wiring diagram:

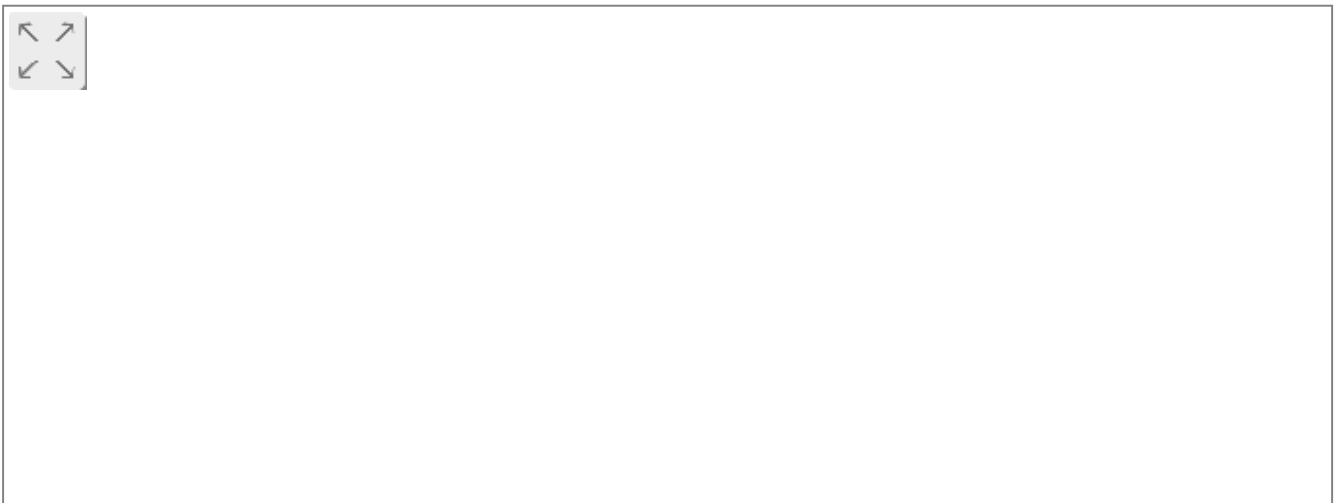
- Non-turbo model

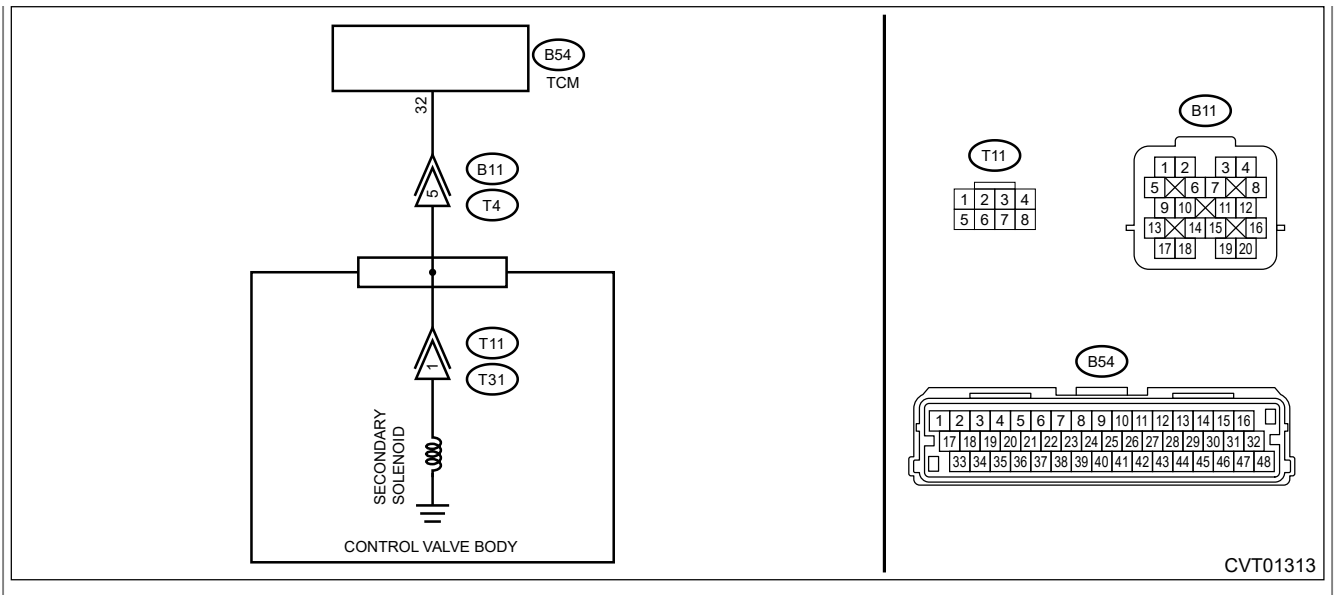
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model

CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK DTC.

Read the DTC using Subaru Select Monitor.

Besides DTC P0747, is any of the DTCs P0842, P0843, P0962 and P0963 displayed?

Yes

Perform the diagnosis according to DTCs other than P0747.

No

[Go to 2.](#)

2. CHECK SECONDARY SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform forced operation of the secondary solenoid. [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Active Test.](#)

Does the indication of 0 → 500 mA appear repeatedly during forced operation, and does operating sound emit during indicating 500 mA?

Yes

[Go to 5.](#)

No

[Go to 3.](#)

3. CHECK SECONDARY SOLENOID.

1. Turn the ignition switch to OFF.

2. Disconnect the transmission connector.
3. Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model

(T4) No. 6 — Transmission body:

Turbo model

(T4) No. 5 — Transmission body:

Is the resistance approximately 5 — 7 Ω ? (when cold)

Yes

 [Go to 7.](#)

No

 [Go to 4.](#)

4. CHECK HARNESS.



Check the transmission harness. (Open circuit, short circuit to power supply, short circuit to ground, and poor contact)

Is the check result OK?

Yes



 [Go to 7.](#)

No

Repair the harness.

5. CHECK TRANSMISSION FLUID.





1. Connect the transmission connector.
2. Check the amount of ATF.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>ADJUSTMENT.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>ADJUSTMENT.](#)

Is the check result OK?

Yes

 [Go to 6.](#)

No

Adjust the amount of ATF.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>ADJUSTMENT.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>ADJUSTMENT.](#)

6. CHECK TRANSMISSION FLUID.



Check the condition of ATF. [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>CONDITION CHECK.](#) [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>CONDITION CHECK.](#)

Is the check result OK?

Yes

[🔗 Go to 7.](#)

No

Check according to the "Corrective action" of ATF (CVTF) "CONDITION CHECK".
[🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>CONDITION CHECK.](#) [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>CONDITION CHECK.](#)

7. CHECK INPUT SIGNAL FOR TCM.

1. Lift up the vehicle.
2. Start the engine.
3. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
4. Depress the brake pedal, and shift the select lever to "D" range.
5. Shift the select lever to "P" range.
6. Stabilize the engine speed at idle.
7. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor.

Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes

[🔗 Go to 8.](#)

No

Replace the control valve body. [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#) [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

8. CHECK INPUT SIGNAL FOR TCM.

1. Keep the engine speed at 3000 rpm.
2. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor.

Is [Actual Secondary Pressure] higher than that of step 7? Does the value change according to the engine speed? And is the value 1.5 — 2.5 MPa?

Yes

[🔗 Go to 9.](#)

No

Replace the control valve body. [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#) [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

9. CHECK TCM INPUT SIGNAL (STALL TEST).



1. Apply the parking brake.
2. Set the select lever to "D" range.
3. Depress the brake pedal firmly.
4. Slowly open the accelerator fully, and stabilize the engine speed.
5. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor.

Caution:

Do not perform a stall test for over 5 seconds at a time.

Is [Actual Secondary Pressure] higher than that of step 8? Does the value change according to the engine speed? And is the value 4.5 – 6.0 MPa?

Yes

[Go to 10.](#)

No

Replace the control valve body. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

10. DRIVING CHECK BY INSPECTION MODE.



1. Turn the ignition switch to OFF.
2. Perform a drive check based on the "Inspection Mode". [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Inspection Mode.](#)

Does the AT OIL TEMP light blink and is DTC P0747 displayed?

Yes

Perform the secondary pressure test. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Secondary Pressure \(Line Pressure\) Test.](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Secondary Pressure \(Line Pressure\) Test.](#)

No

Current condition is normal. It is possible that temporary poor contact occurs.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of transmission line pressure solenoid and hydraulic circuit (stuck to high pressure side).
- Judge as NG if "Target line pressure – Actual line pressure" becomes the predetermined value or less, while the actual line pressure is equal to or more than the predetermined value.

2. EXECUTION CONDITION

--	--

Transmission fluid temperature (degC)	- 40	25600	25600	5752	5752	5712	5616	5531
	- 20	25600	25600	5752	5752	5712	5616	5531
	0	25600	25600	5510	5565	5605	5649	5701
	20	25600	25600	5414	5476	5537	5579	5617
	40	25600	25600	5359	5359	5445	5514	5567
	60	25600	25600	5312	5312	5401	5490	5545
	80	25600	25600	5312	5312	5401	5490	5545
	100	25600	25600	5343	5343	5343	5427	5499
	120	25600	25600	5140	5140	5140	5281	5348
	140	25600	25600	5277	5277	5277	5277	5372

		Engine speed (rpm)						
		3500	4000	4500	5000	5500	6000	6500
Transmission fluid temperature (degC)	- 40	5549	5556	5581	5612	5671	5706	5719
	- 20	5549	5556	5581	5612	5671	5706	5719
	0	5750	5801	5851	5911	5976	6026	6078
	20	5664	5710	5769	5822	5862	5927	5983
	40	5610	5659	5718	5777	5825	5873	5929
	60	5578	5621	5668	5718	5763	5813	5863
	80	5578	5621	5668	5718	5763	5813	5863
	100	5577	5609	5650	5694	5739	5796	5810
	120	5415	5450	5482	5523	5549	5585	5604
	140	5480	5530	5560	5596	5628	5608	5661

Map 1: Turbo model (Command of the torque converter clutch circuit control solenoid output = OFF)

		Engine speed (rpm)						
		0	500	1000	1500	2000	2500	3000
Transmission fluid temperature (degC)	- 40	25600	25600	6213	5778	5748	5640	5608
	- 20	25600	25600	6213	5778	5748	5640	5608
	0	25600	25600	5512	5563	5603	5644	5677
	20	25600	25600	5379	5438	5510	5562	5600
	40	25600	25600	5277	5277	5381	5470	5533
	60	25600	25600	5316	5316	5336	5431	5503
	80	25600	25600	5403	5403	5403	5444	5519
	100	25600	25600	5381	5381	5381	5381	5446
	120	25600	25600	5255	5255	5255	5255	5336
	140	25600	25600	5128	5128	5128	5128	5174

		Engine speed (rpm)						
		3500	4000	4500	5000	5500	6000	6500
Transmission fluid temperature (degC)	- 40	5590	5582	5599	5635	5689	5740	5824
	- 20	5590	5582	5599	5635	5689	5740	5824

0	5714	5758	5805	5881	5941	5998	6046
20	5644	5691	5739	5795	5850	5899	5958
40	5579	5629	5678	5737	5788	5844	5900
60	5552	5595	5648	5697	5747	5800	5854
80	5568	5617	5667	5709	5761	5833	5854
100	5524	5587	5615	5666	5725	5784	5798
120	5421	5473	5525	5570	5626	5636	5659
140	5269	5326	5361	5401	5434	5440	5470

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0751 SHIFT SOLENOID "A" PERFORMANCE/STUCK OFF

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

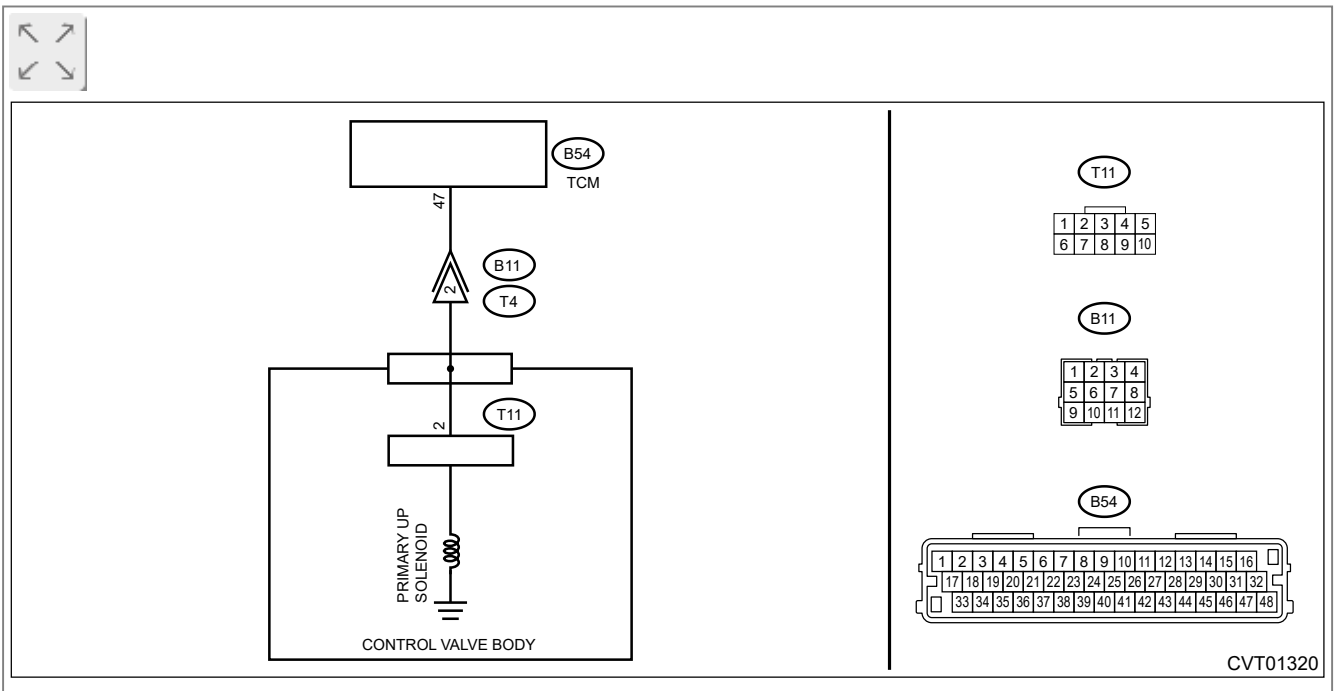
Trouble symptom:

- Shift control malfunction
- Engine speed increases abruptly.

Wiring diagram:

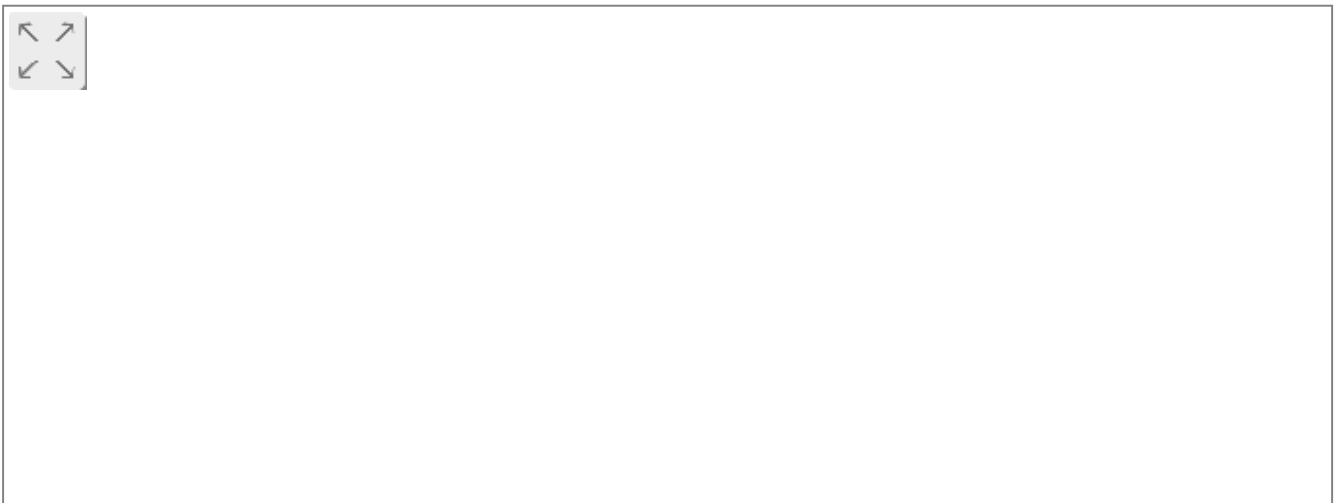
- Non-turbo model

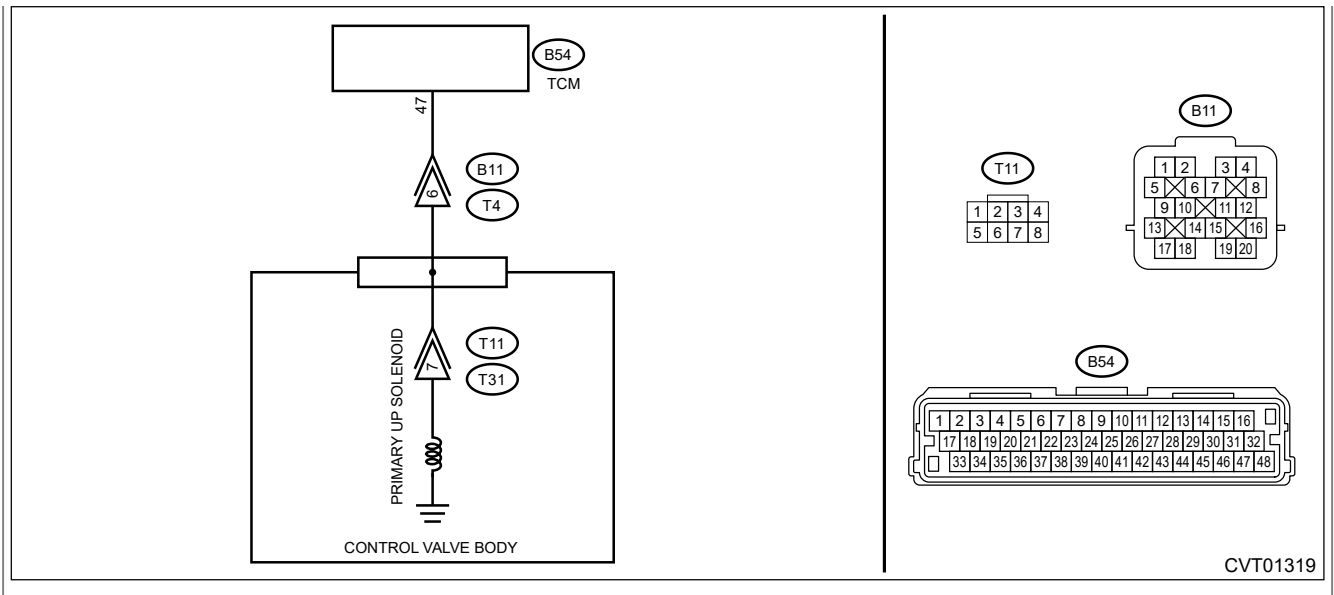
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model

CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK DTC.

Read the DTC using Subaru Select Monitor.

Besides DTC P0751, is any of the DTCs P0973, P0974, P0976, P0977, P2747 and P2751 displayed?

Yes

Perform the diagnosis according to DTCs other than P0751.

No

[Go to 2.](#)

2. CHECK PRIMARY UP SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform forced operation of the primary UP solenoid. [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Active Test.](#)

Does the indication of 0 → 50% appear repeatedly during forced operation, and does operating sound emit during indicating 50%?

Yes

[Go to 5.](#)

No

[Go to 3.](#)

3. CHECK PRIMARY UP SOLENOID.

1. Turn the ignition switch to OFF.
2. Disconnect the transmission connector.
3. Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model

(T4) No. 2 — Transmission body:

Turbo model

(T4) No. 6 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω ? (when cold)

Yes

 [Go to 7.](#)

No

 [Go to 4.](#)

4. CHECK HARNESS.



Check the transmission harness. (Open circuit, short circuit to power supply, short circuit to ground, and poor contact)

Is the check result OK?

Yes



 [Go to 7.](#)

No

Repair the harness.


5. CHECK TRANSMISSION FLUID.





1. Connect the transmission connector.
2. Check the amount of ATF.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>ADJUSTMENT.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>ADJUSTMENT.](#)

Is the check result OK?

Yes

 [Go to 6.](#)

No

Adjust the amount of ATF.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>ADJUSTMENT.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>ADJUSTMENT.](#)

6. CHECK TRANSMISSION FLUID.



Check the condition of ATF. [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>CONDITION CHECK.](#) [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>CONDITION CHECK.](#)

Is the check result OK?

Yes

[🔗 Go to 7.](#)

No

Check according to the "Corrective action" of ATF (CVTF) "CONDITION CHECK".
[🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>CONDITION CHECK.](#) [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>CONDITION CHECK.](#)

7. CHECK INPUT SIGNAL FOR TCM.

1. Lift up the vehicle.
2. Start the engine.
3. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
4. Depress the brake pedal, and shift the select lever to "D" range.
5. Shift the select lever to "P" range.
6. Stabilize the engine speed at idle.
7. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor.

Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes

[🔗 Go to 8.](#)

No

Replace the transmission assembly. [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#) [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

8. CHECK INPUT SIGNAL FOR TCM.

1. Set the select lever to "D" range.
2. Release the brake pedal to stabilize the engine speed and front wheel speed.
3. Read the data of [Actual Gear Ratio] using Subaru Select Monitor.



Is [Actual Gear Ratio] as follows?

- Non-turbo model
1.5 — 2.6
- Turbo model
2.0 — 2.4

Yes

 [Go to 9.](#)

No

Replace the transmission assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

9. CHECK INPUT SIGNAL FOR TCM.

1. Set the select lever to "D" range.
2. Slowly increase the speed to 40 km/h (25 MPH) and keep to a constant speed.
3. Read the data of [Actual Gear Ratio] using Subaru Select Monitor.

Is [Actual Gear Ratio] as follows?


- Non-turbo model

0.5 – 0.9



- Turbo model

0.5 – 0.8


Yes

 [Go to 10.](#)

No



Replace the transmission assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

10. DRIVING CHECK BY INSPECTION MODE.

1. Turn the ignition switch to OFF.
2. Perform a drive check based on the "Inspection Mode".  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Inspection Mode.](#)

Does the AT OIL TEMP light blink and is DTC P0751 displayed?

Yes

Replace the transmission assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

No

Current condition is normal. It is possible that temporary poor contact occurs.

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect the malfunction of shift-up fluid pressure control solenoid and hydraulic circuit characteristics (stuck to low pressure side).
- Judge as NG if the amount of gear rate change per second is equal to or larger than the predetermined value, even though the up-shift command is issued.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Engine speed	≥ 1000 rpm
Commanded duty of shift down pressure control solenoid	0%
Actual pulley ratio*	> 1.5 and < 2.549

* Actual pulley ratio: Measured primary pulley shaft speed / Measured secondary pulley shaft speed

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Actual pulley ratio change for 1 second	> -0.08
Commanded duty of shift up pressure control solenoid	≥ 90%

Time needed for diagnosis: 1 second

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect the malfunction of shift-up fluid pressure control solenoid and hydraulic circuit characteristics (stuck to low pressure side).
- Judge as NG if the amount of gear rate change per second is equal to or larger than the predetermined value, even though the up-shift command is issued.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Engine speed	≥ 1000 rpm
Commanded duty of shift down pressure control solenoid	0%
Actual pulley ratio*	> 1.5 and < 2.348

* Actual pulley ratio: Measured primary pulley shaft speed / Measured secondary pulley shaft speed

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Actual pulley ratio change for 1 second	> -0.08
Commanded duty of shift up pressure control solenoid	≥ 90%

Time needed for diagnosis: 1 second

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0752 SHIFT SOLENOID "A" STUCK ON

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

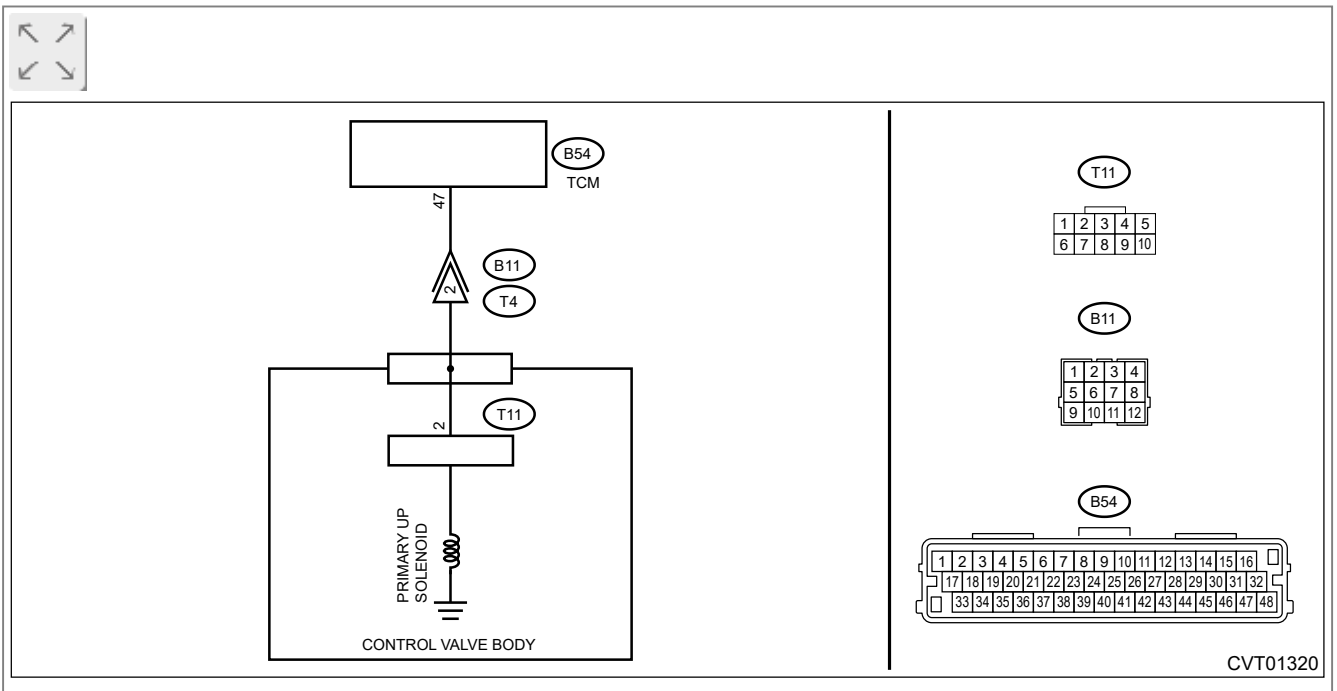
Trouble symptom:

- Acceleration is poor during standing start.
- Shift control malfunction

Wiring diagram:

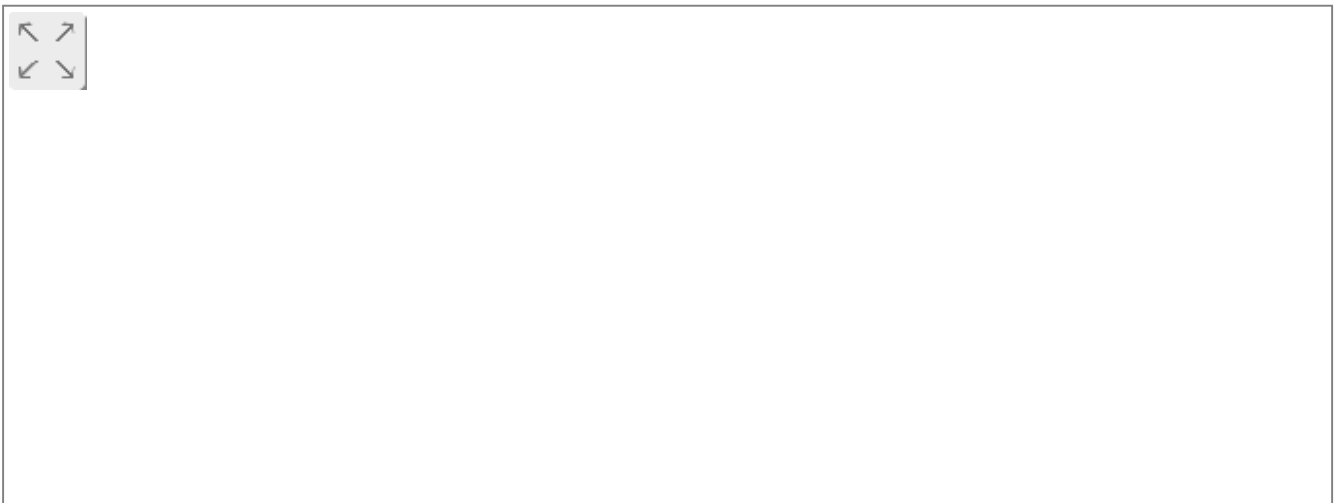
- Non-turbo model

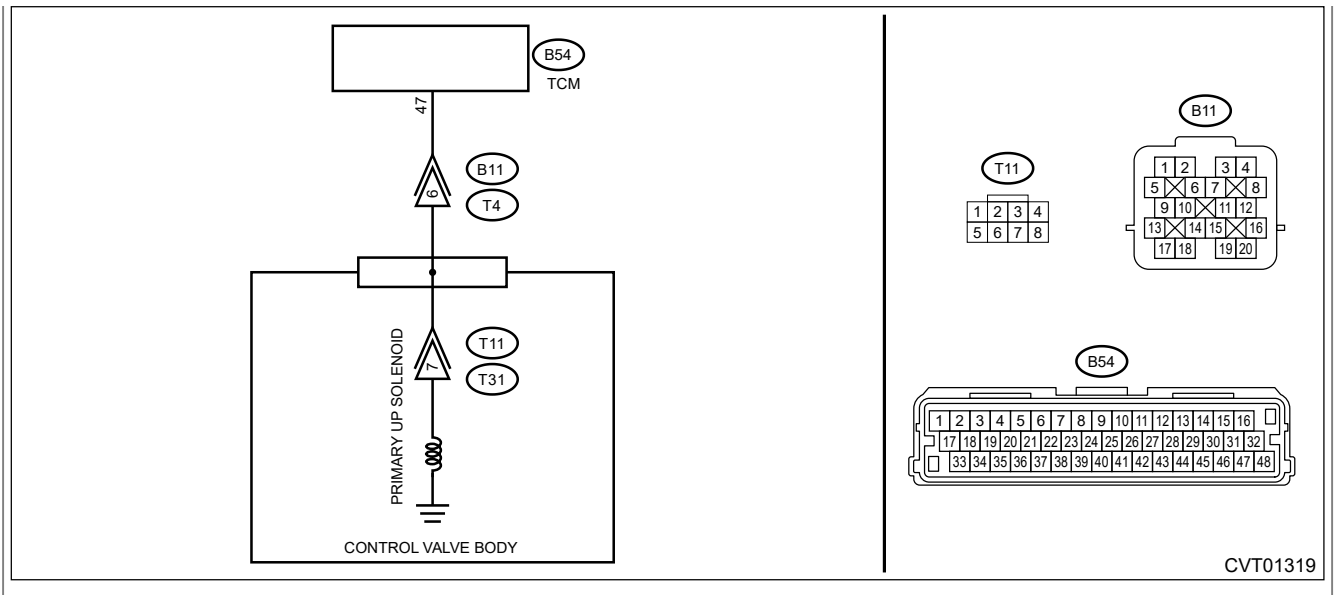
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model

CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK DTC.

Read the DTC using Subaru Select Monitor.

Besides DTC P0752, is any of the DTCs P0973, P0974, P0976, P0977, P2747 and P2751 displayed?

- Perform the diagnosis according to DTCs other than P0752.
- [Go to 2.](#)

2. CHECK PRIMARY UP SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform forced operation of the primary UP solenoid. [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Active Test.](#)

Does the indication of 0 → 50% appear repeatedly during forced operation, and does operating sound emit during indicating 50%?

- [Go to 5.](#)
- [Go to 3.](#)

3. CHECK PRIMARY UP SOLENOID.

1. Turn the ignition switch to OFF.
2. Disconnect the transmission connector.
3. Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model


(T4) No. 2 — Transmission body:

Turbo model


(T4) No. 6 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω ? (when cold)

Yes

 [Go to 7.](#)

No

 [Go to 4.](#)


4. CHECK HARNESS.



Check the transmission harness. (Open circuit, short circuit to power supply, short circuit to ground, and poor contact)

Is the check result OK?

Yes



 [Go to 7.](#)

No

Repair the harness.


5. CHECK TRANSMISSION FLUID.





1. Connect the transmission connector.
2. Check the amount of ATF.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>ADJUSTMENT.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>ADJUSTMENT.](#)

Is the check result OK?

Yes



 [Go to 6.](#)

No

Adjust the amount of ATF.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>ADJUSTMENT.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>ADJUSTMENT.](#)


6. CHECK TRANSMISSION FLUID.





Check the condition of ATF.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>CONDITION CHECK.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>CONDITION CHECK.](#)

Is the check result OK?

Yes

 [Go to 7.](#)

No

Check according to the "Corrective action" of ATF (CVTF) "CONDITION CHECK".
 [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>CONDITION CHECK.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>CONDITION CHECK.](#)

7. CHECK INPUT SIGNAL FOR TCM.



1. Lift up the vehicle.
2. Start the engine.
3. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
4. Depress the brake pedal, and shift the select lever to "D" range.
5. Shift the select lever to "P" range.
6. Stabilize the engine speed at idle.
7. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor.

Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes

 [Go to 8.](#)

No

Replace the transmission assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

8. CHECK INPUT SIGNAL FOR TCM.

1. Set the select lever to "D" range.
2. Release the brake pedal to stabilize the engine speed and front wheel speed.
3. Read the data of [Actual Gear Ratio] using Subaru Select Monitor.



Is [Actual Gear Ratio] as follows?

- Non-turbo model
1.5 — 2.6
- Turbo model
2.0 — 2.4

Yes

 [Go to 9.](#)

No

Replace the transmission assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

9. CHECK INPUT SIGNAL FOR TCM.

1. Set the select lever to "D" range.
2. Slowly increase the speed to 40 km/h (25 MPH) and keep to a constant speed.
3. Read the data of [Actual Gear Ratio] using Subaru Select Monitor.

Is [Actual Gear Ratio] as follows?


- Non-turbo model

0.5 – 0.9



- Turbo model

0.5 – 0.8


Yes

 [Go to 10.](#)

No



Replace the transmission assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

10. DRIVING CHECK BY INSPECTION MODE.

1. Turn the ignition switch to OFF.
2. Perform a drive check based on the "Inspection Mode".  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Inspection Mode.](#)

Does the AT OIL TEMP light blink and is DTC P0752 displayed?

Yes

Replace the transmission assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

No

Current condition is normal. It is possible that temporary poor contact occurs.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of shift-up fluid pressure control solenoid and hydraulic circuit characteristics (stuck to high pressure side).
- Judge as NG if the amount of gear rate change per second is within the predetermined value, even though the down-shift command is issued.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Engine speed	≥ 1000 rpm
Commanded duty of shift up pressure control solenoid	0%
Actual pulley ratio*	< 0.5

* Actual pulley ratio: Measured primary pulley shaft speed / Measured secondary pulley shaft speed

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Actual pulley ratio change for 1 second	> -0.08 and < 0.08
Commanded duty of shift down pressure control solenoid	> 80%

Time needed for diagnosis: 1 second

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0756 SHIFT SOLENOID "B" PERFORMANCE/STUCK OFF

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

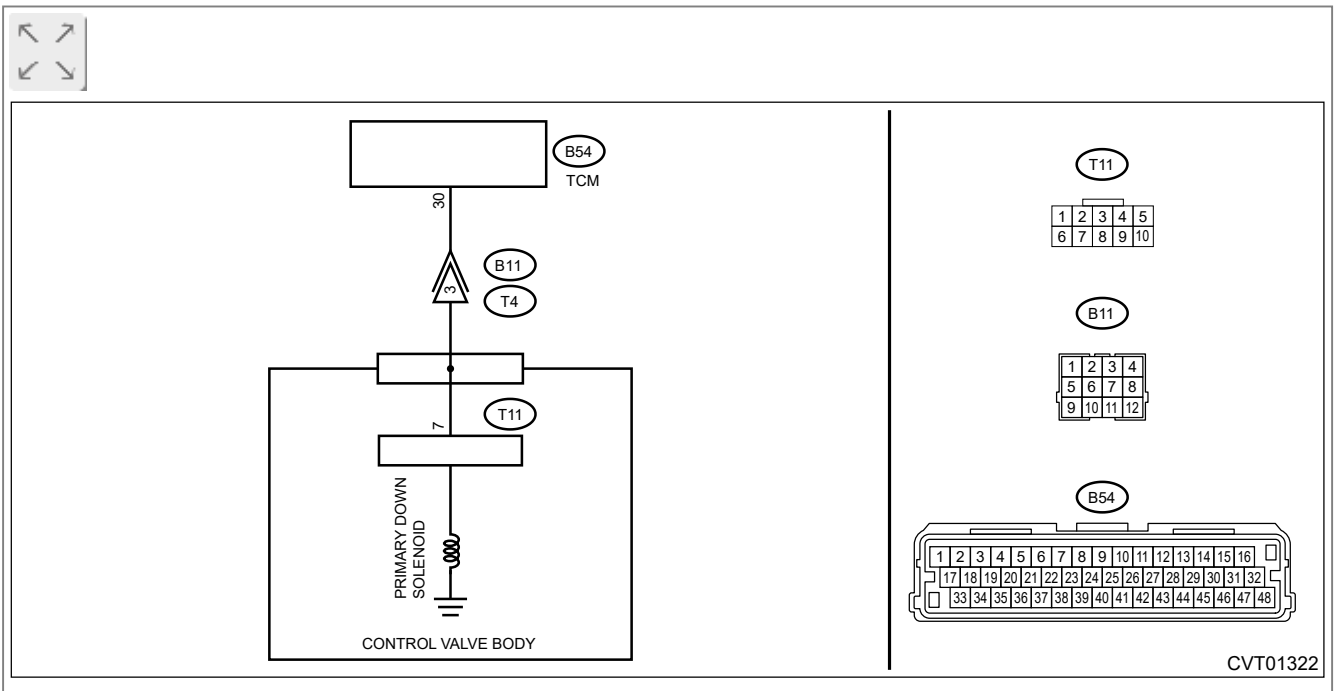
Trouble symptom:

- Acceleration is poor during standing start.
- Shift control malfunction

Wiring diagram:

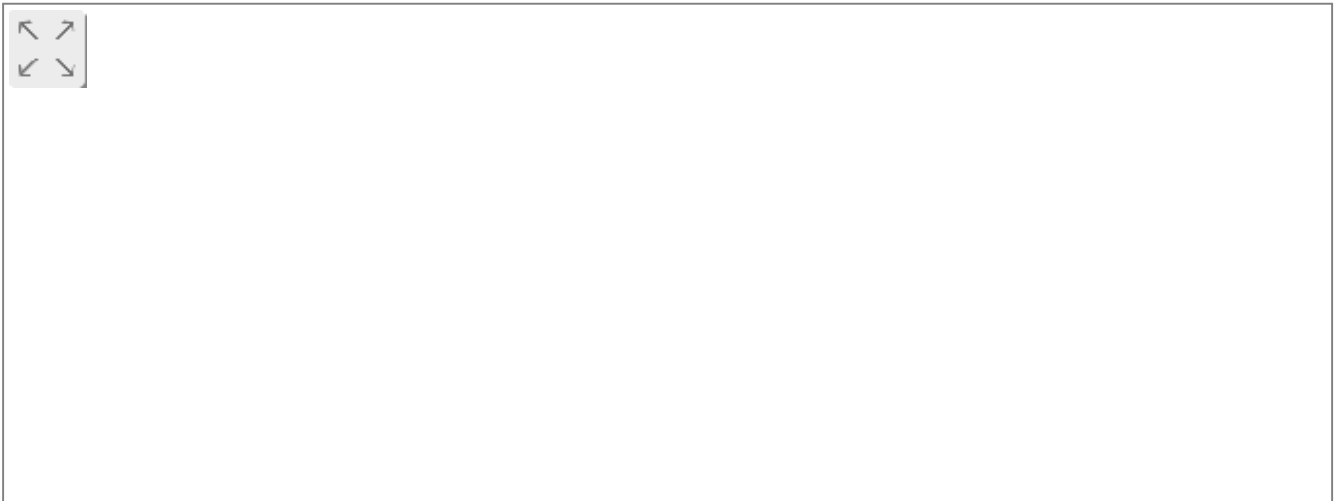
- Non-turbo model

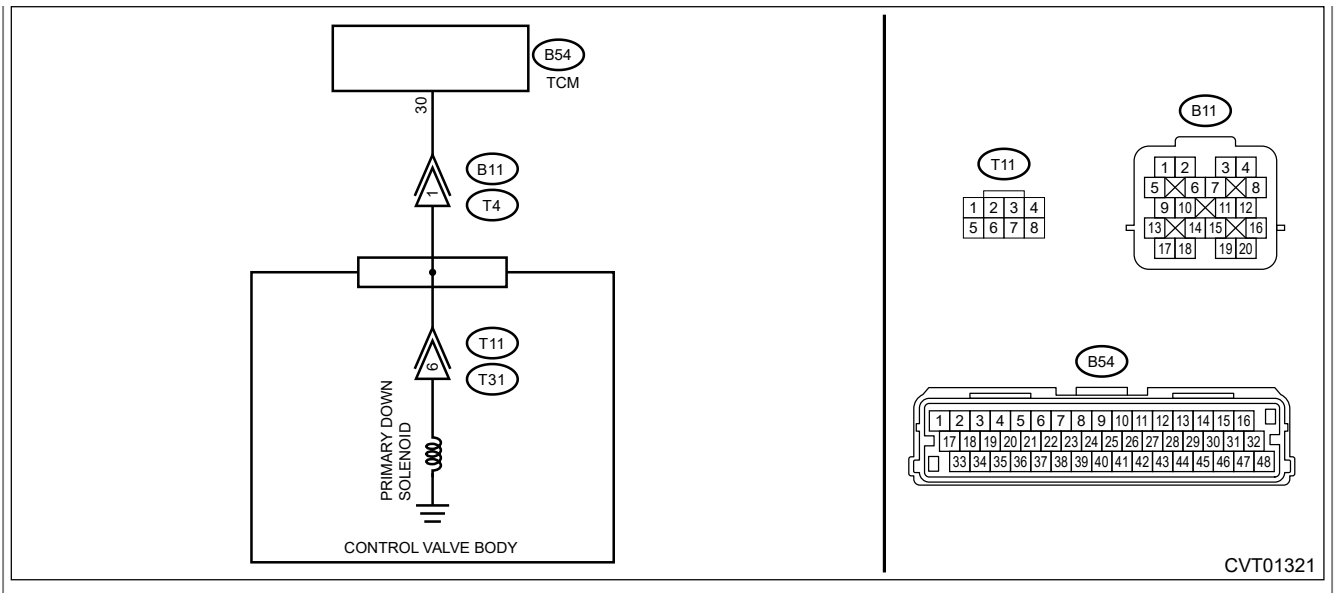
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model

CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK DTC.

Read the DTC using Subaru Select Monitor.

Besides DTC P0756, is any of the DTCs P0973, P0974, P0976, P0977, P2747 and P2751 displayed?

- Perform the diagnosis according to DTCs other than P0756.
- [Go to 2.](#)

2. CHECK PRIMARY DOWN SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform forced operation of the primary DOWN solenoid.
[Ref. to TRANSMISSION \(DIAGNOSTICS\)>Active Test.](#)

Does the indication of 0 → 50% appear repeatedly during forced operation, and does operating sound emit during indicating 50%?

- [Go to 5.](#)
- [Go to 3.](#)

3. CHECK PRIMARY DOWN SOLENOID.

1. Turn the ignition switch to OFF.
2. Disconnect the transmission connector.
3. Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model


(T4) No. 3 — Transmission body:

Turbo model

(T4) No. 1 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω ? (when cold)

Yes

 [Go to 7.](#)

No

 [Go to 4.](#)


4. CHECK HARNESS.



Check the transmission harness. (Open circuit, short circuit to power supply, short circuit to ground, and poor contact)

Is the check result OK?

Yes



 [Go to 7.](#)

No

Repair the harness.


5. CHECK TRANSMISSION FLUID.





1. Connect the transmission connector.
2. Check the amount of ATF.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>ADJUSTMENT.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>ADJUSTMENT.](#)

Is the check result OK?

Yes



 [Go to 6.](#)

No

Adjust the amount of ATF.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>ADJUSTMENT.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>ADJUSTMENT.](#)


6. CHECK TRANSMISSION FLUID.





Check the condition of ATF.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>CONDITION CHECK.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>CONDITION CHECK.](#)

Is the check result OK?

Yes

 [Go to 7.](#)

No


Check according to the "Corrective action" of ATF (CVTF) "CONDITION CHECK".  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>CONDITION CHECK.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>CONDITION CHECK.](#)

7. CHECK INPUT SIGNAL FOR TCM.



1. Lift up the vehicle.
2. Start the engine.
3. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
4. Depress the brake pedal, and shift the select lever to "D" range.
5. Shift the select lever to "P" range.
6. Stabilize the engine speed at idle.
7. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor.

Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes

 [Go to 8.](#)

No

Replace the transmission assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

8. CHECK INPUT SIGNAL FOR TCM.

1. Set the select lever to "D" range.
2. Release the brake pedal to stabilize the engine speed and front wheel speed.
3. Read the data of [Actual Gear Ratio] using Subaru Select Monitor.



Is [Actual Gear Ratio] as follows?

- Non-turbo model
1.5 — 2.6
- Turbo model
2.0 — 2.4

Yes

 [Go to 9.](#)

No

Replace the transmission assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

9. CHECK INPUT SIGNAL FOR TCM.

1. Set the select lever to "D" range.
2. Slowly increase the speed to 40 km/h (25 MPH) and keep to a constant speed.
3. Read the data of [Actual Gear Ratio] using Subaru Select Monitor.

Is [Actual Gear Ratio] as follows?


- Non-turbo model

0.5 – 0.9



- Turbo model

0.5 – 0.8


Yes

 [Go to 10.](#)

No



Replace the transmission assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

10. DRIVING CHECK BY INSPECTION MODE.

1. Turn the ignition switch to OFF.
2. Perform a drive check based on the "Inspection Mode".  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Inspection Mode.](#)

Does the AT OIL TEMP light blink and is DTC P0756 displayed?

Yes

Replace the transmission assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

No

Current condition is normal. It is possible that temporary poor contact occurs.

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect the malfunction of shift-down fluid pressure control solenoid and hydraulic circuit characteristics (stuck to low pressure side).
- Judge as NG if the amount of gear rate change per second is within the predetermined value, even though the down-shift command is issued.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Engine speed	≥ 1000 rpm
Commanded duty of shift up pressure control solenoid	0%
Actual pulley ratio*	≥0.406 and ≤2.549

* Actual pulley ratio: Measured primary pulley shaft speed / Measured secondary pulley shaft speed

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Actual pulley ratio change for 1 second	> -0.08 and < 0.08
Commanded duty of shift down pressure control solenoid	> 80%

Time needed for diagnosis: 1 second

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect the malfunction of shift-down fluid pressure control solenoid and hydraulic circuit characteristics (stuck to low pressure side).
- Judge as NG if the amount of gear rate change per second is within the predetermined value, even though the down-shift command is issued.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Engine speed	≥ 1000 rpm
Commanded duty of shift up pressure control solenoid	0%
Actual pulley ratio*	≥0.363 and ≤2.348

* Actual pulley ratio: Measured primary pulley shaft speed / Measured secondary pulley shaft speed

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Actual pulley ratio change for 1 second	> -0.08 and < 0.08
Commanded duty of shift down pressure control solenoid	> 80%

Time needed for diagnosis: 1 second

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0757 SHIFT SOLENOID "B" STUCK ON

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

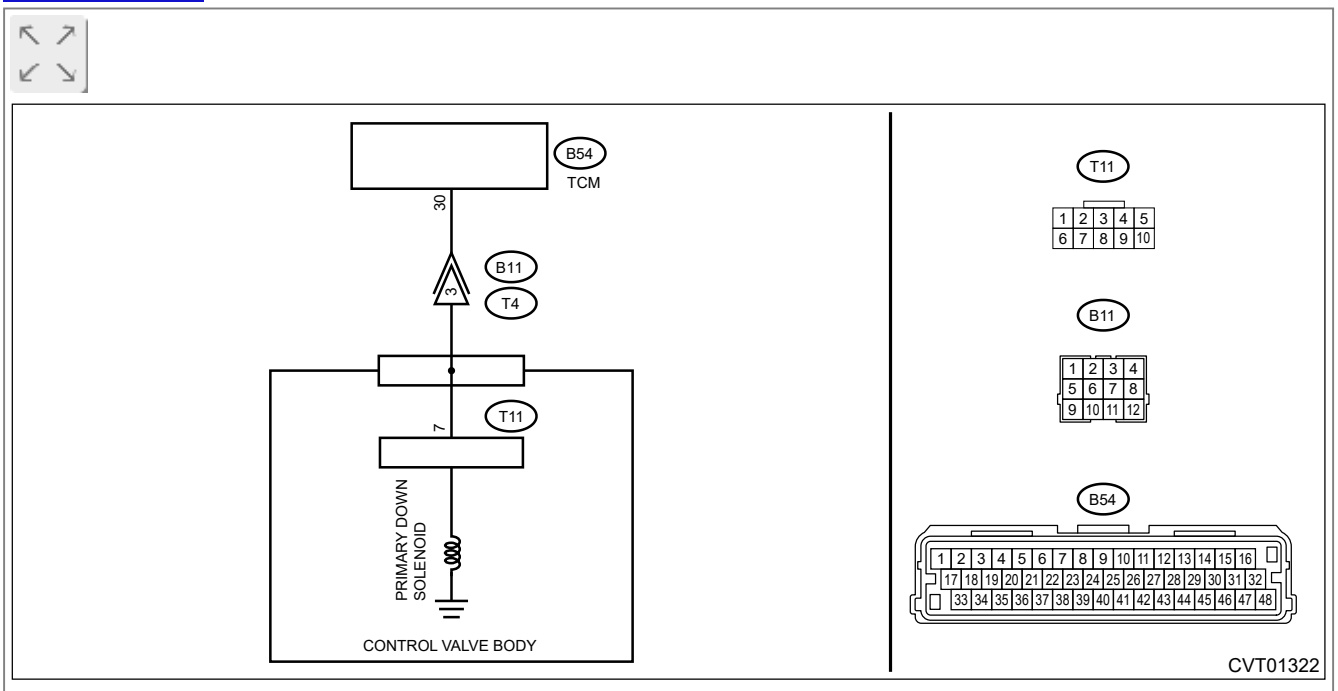
Trouble symptom:

- Vibration occurs at shift change.
- Shift control malfunction

Wiring diagram:

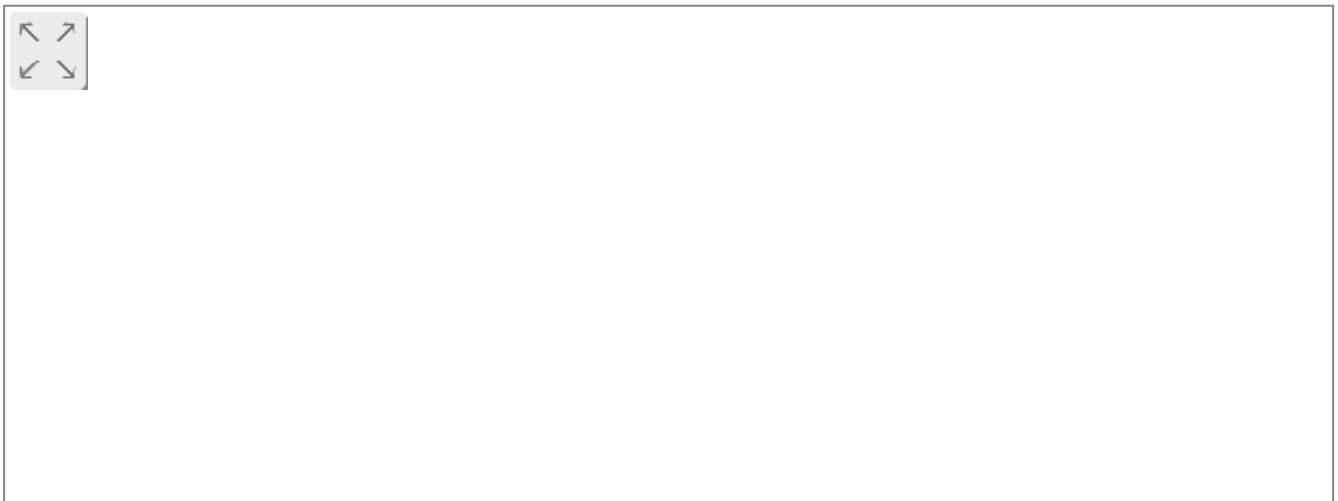
- Non-turbo model

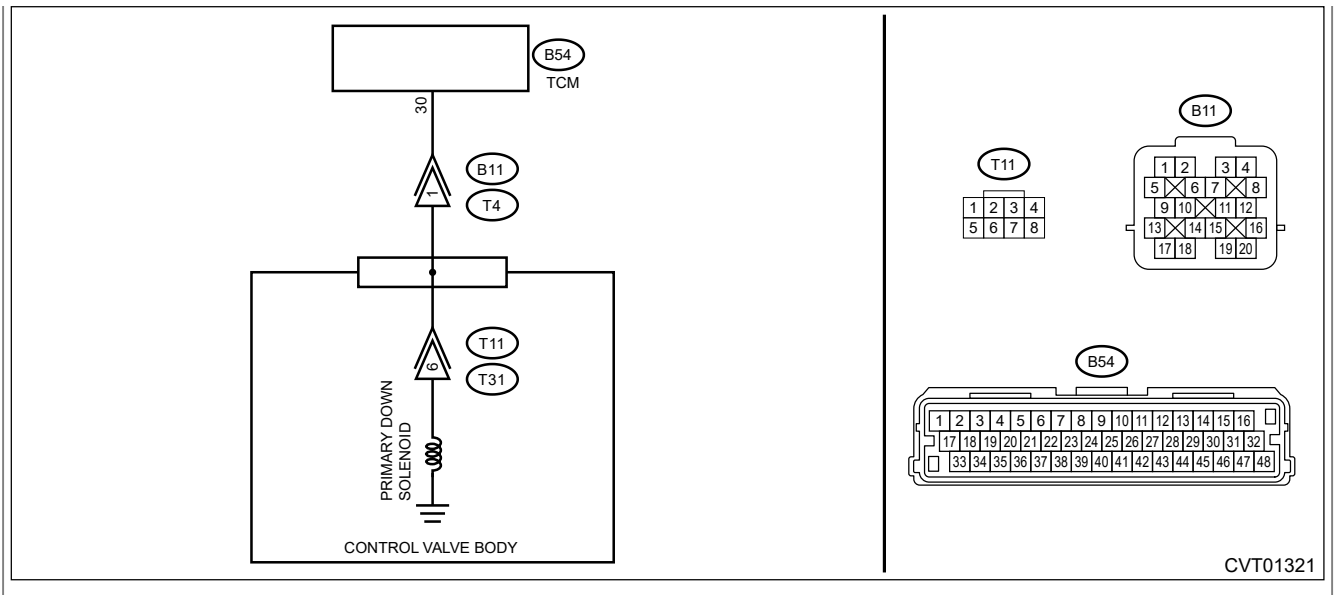
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model

CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK DTC.

Read the DTC using Subaru Select Monitor.

Besides DTC P0757, is any of the DTCs P0973, P0974, P0976, P0977, P2747 and P2751 displayed?

Yes

Perform the diagnosis according to DTCs other than P0757.

No

[Go to 2.](#)

2. CHECK PRIMARY DOWN SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform forced operation of the primary DOWN solenoid.
[Ref. to TRANSMISSION \(DIAGNOSTICS\)>Active Test.](#)

Does the indication of 0 → 50% appear repeatedly during forced operation, and does operating sound emit during indicating 50%?

Yes

[Go to 5.](#)

No

[Go to 3.](#)

3. CHECK PRIMARY DOWN SOLENOID.

1. Turn the ignition switch to OFF.
2. Disconnect the transmission connector.
3. Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model


(T4) No. 3 — Transmission body:

Turbo model


(T4) No. 1 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω ? (when cold)

Yes

 [Go to 7.](#)

No

 [Go to 4.](#)

4. CHECK HARNESS.



Check the transmission harness. (Open circuit, short circuit to power supply, short circuit to ground, and poor contact)

Is the check result OK?

Yes



 [Go to 7.](#)

No

Repair the harness.

5. CHECK TRANSMISSION FLUID.





1. Connect the transmission connector.
2. Check the amount of ATF.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>ADJUSTMENT.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>ADJUSTMENT.](#)

Is the check result OK?

Yes



 [Go to 6.](#)

No

Adjust the amount of ATF.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>ADJUSTMENT.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>ADJUSTMENT.](#)


6. CHECK TRANSMISSION FLUID.





Check the condition of ATF.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>CONDITION CHECK.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>CONDITION CHECK.](#)

Is the check result OK?

Yes

 [Go to 7.](#)

No

Check according to the "Corrective action" of ATF (CVTF) "CONDITION CHECK".
 [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>CONDITION CHECK.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>CONDITION CHECK.](#)

7. CHECK INPUT SIGNAL FOR TCM.



1. Lift up the vehicle.
2. Start the engine.
3. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
4. Depress the brake pedal, and shift the select lever to "D" range.
5. Shift the select lever to "P" range.
6. Stabilize the engine speed at idle.
7. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor.

Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes

 [Go to 8.](#)

No

Replace the transmission assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

8. CHECK INPUT SIGNAL FOR TCM.

1. Set the select lever to "D" range.
2. Release the brake pedal to stabilize the engine speed and front wheel speed.
3. Read the data of [Actual Gear Ratio] using Subaru Select Monitor.



Is [Actual Gear Ratio] as follows?

- Non-turbo model
1.5 — 2.6
- Turbo model
2.0 — 2.4

Yes

 [Go to 9.](#)

No

Replace the transmission assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

9. CHECK INPUT SIGNAL FOR TCM.

1. Set the select lever to "D" range.
2. Slowly increase the speed to 40 km/h (25 MPH) and keep to a constant speed.
3. Read the data of [Actual Gear Ratio] using Subaru Select Monitor.

Is [Actual Gear Ratio] as follows?


- Non-turbo model

0.5 – 0.9



- Turbo model

0.5 – 0.8


Yes

 [Go to 10.](#)

No



Replace the transmission assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

10. DRIVING CHECK BY INSPECTION MODE.

1. Turn the ignition switch to OFF.
2. Perform a drive check based on the "Inspection Mode".  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Inspection Mode.](#)

Does the AT OIL TEMP light blink and is DTC P0757 displayed?

Yes

Replace the transmission assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

No

Current condition is normal. It is possible that temporary poor contact occurs.

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect the malfunction of shift-down fluid pressure control solenoid and hydraulic circuit characteristics (stuck to high pressure side).
- Judge as NG if the amount of gear rate change per second is equal to or larger than the predetermined value, even though the up-shift command is issued.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Engine speed	≥ 1000 rpm
Commanded duty of shift down pressure control solenoid	0%
Actual pulley ratio*	≥0.406 and ≤2.549

* Actual pulley ratio: Measured primary pulley shaft speed / Measured secondary pulley shaft speed

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Actual pulley ratio change for 1 second	> 0.04
Commanded duty of shift up pressure control solenoid	> 50%

Time needed for diagnosis: 1 s × 10 times

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect the malfunction of shift-down fluid pressure control solenoid and hydraulic circuit characteristics (stuck to high pressure side).
- Judge as NG if the amount of gear rate change per second is equal to or larger than the predetermined value, even though the up-shift command is issued.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Engine speed	≥ 1000 rpm
Commanded duty of shift down pressure control solenoid	0%
Actual pulley ratio*	≥0.363 and ≤2.348

* Actual pulley ratio: Measured primary pulley shaft speed / Measured secondary pulley shaft speed

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Actual pulley ratio change for 1 second	> 0.04
Commanded duty of shift up pressure control solenoid	> 50%

Time needed for diagnosis: 1 s × 10 times

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0776 PRESSURE CONTROL SOLENOID "B" PERFORMANCE/STUCK OFF

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

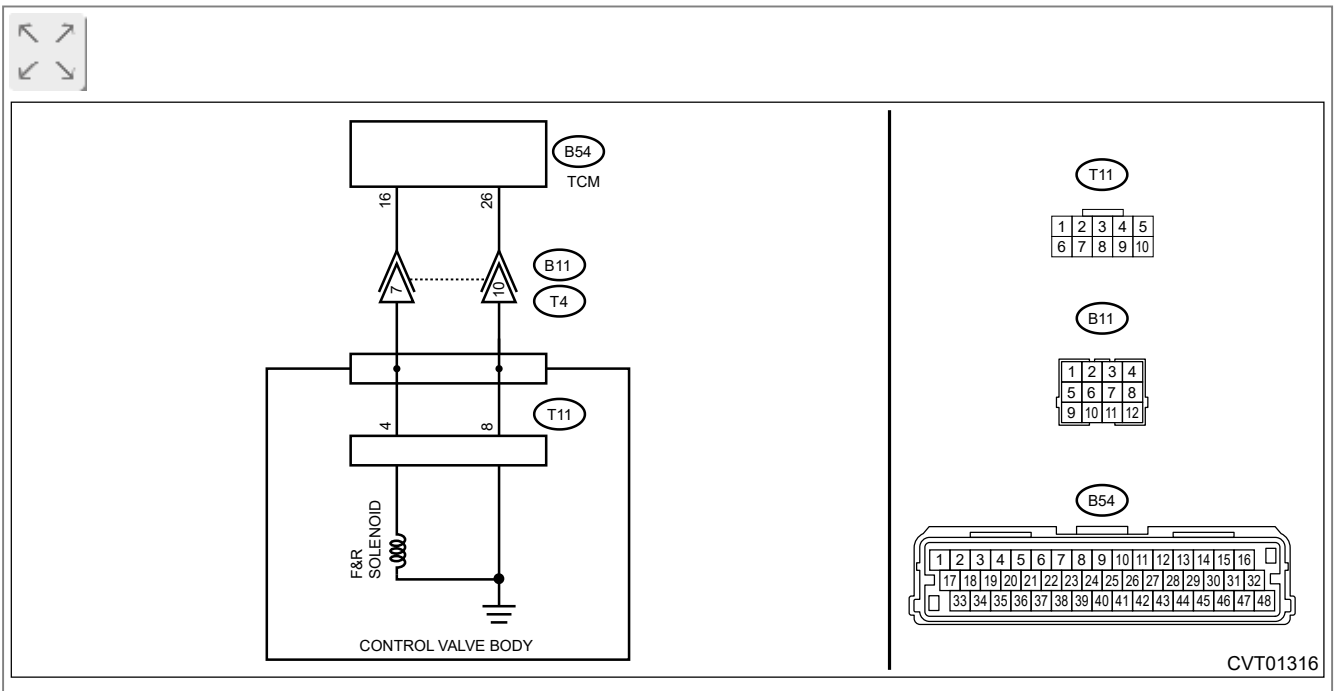
Trouble symptom:

- Engine speed increases abruptly, and can not accelerate.
- Excessive slippage is felt.

Wiring diagram:

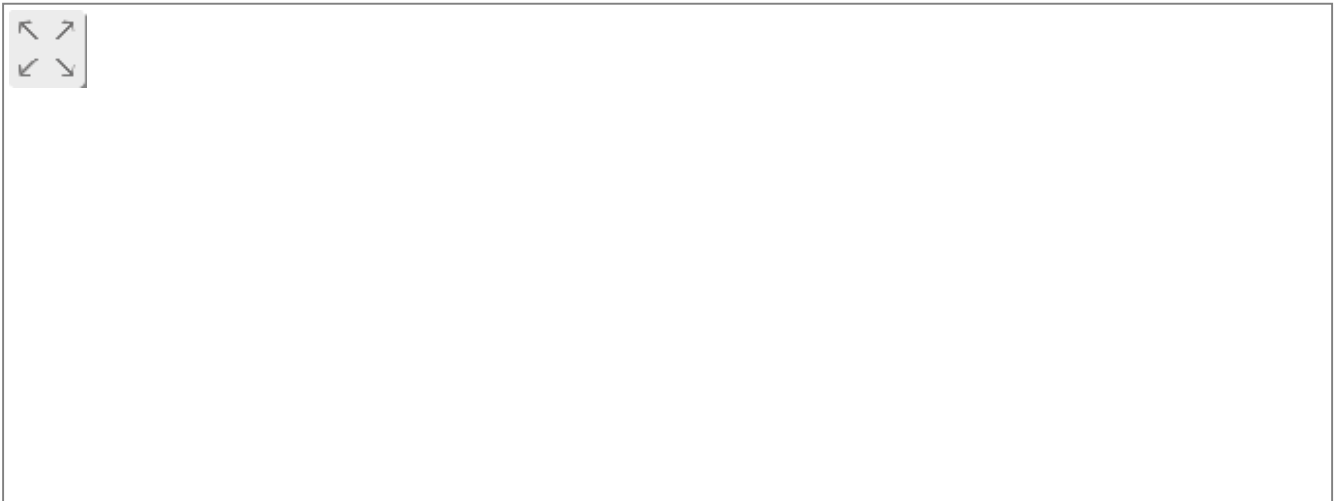
- Non-turbo model

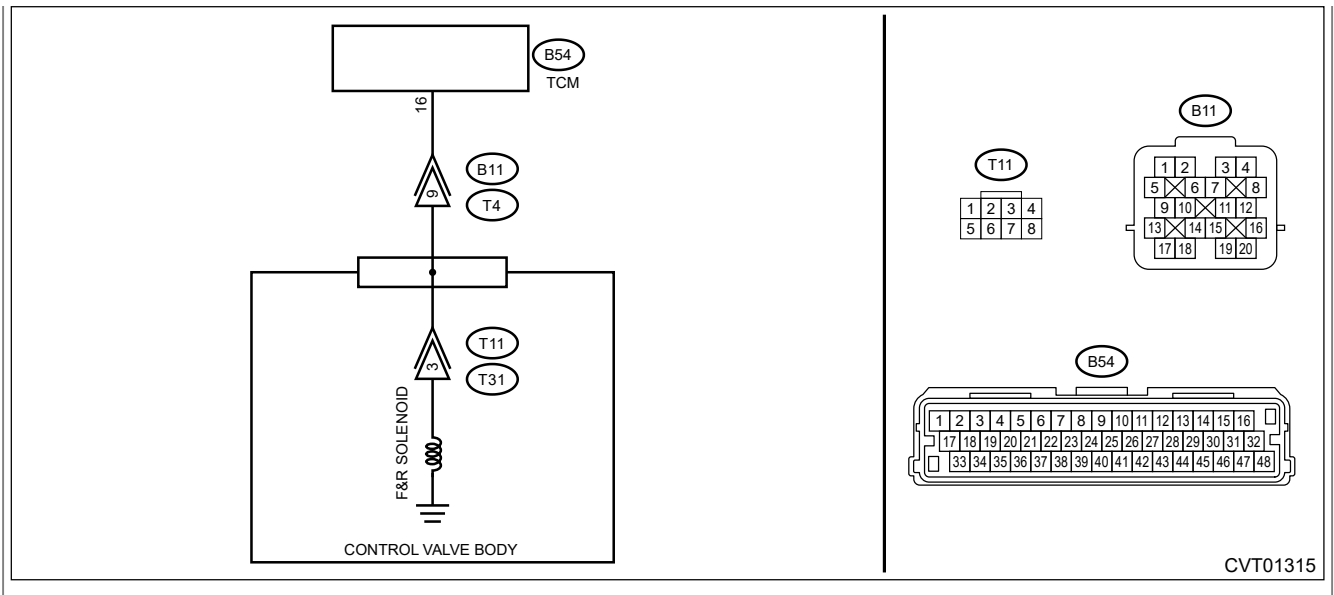
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model

CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK DTC.

Read the DTC using Subaru Select Monitor.

Besides DTC P0776, is any of the DTCs P0717, P0720, P0966, P0967, P2747 and P2751 displayed?

Yes

Perform the diagnosis according to DTCs other than P0776.

No

[Go to 2.](#)

2. CHECK F&R SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform forced operation of the F&R solenoid. [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Active Test.](#)

Does the indication of 0 → 500 mA appear repeatedly during forced operation, and does operating sound emit during indicating 500 mA?

Yes

[Go to 5.](#)

No

[Go to 3.](#)

3. CHECK F&R SOLENOID.

1. Turn the ignition switch to OFF.
2. Disconnect the transmission connector.
3. Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model


(T4) No. 7 — Transmission body:

Turbo model


(T4) No. 9 — Transmission body:

Is the resistance approximately 4 — 6 Ω ? (when cold)

Yes

 [Go to 7.](#)

No

 [Go to 4.](#)

4. CHECK HARNESS.



Check the transmission harness. (Open circuit, short circuit to power supply, short circuit to ground, and poor contact)

Is the check result OK?

Yes



 [Go to 7.](#)

No

Repair the harness.

5. CHECK TRANSMISSION FLUID.





1. Connect the transmission connector.
2. Check the amount of ATF.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>ADJUSTMENT.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>ADJUSTMENT.](#)

Is the check result OK?

Yes

 [Go to 6.](#)

No

Adjust the amount of ATF.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>ADJUSTMENT.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>ADJUSTMENT.](#)

6. CHECK TRANSMISSION FLUID.



Check the condition of ATF. [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>CONDITION CHECK.](#) [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>CONDITION CHECK.](#)

Is the check result OK?

Yes

[🔗 Go to 7.](#)

No

Check according to the "Corrective action" of ATF (CVTF) "CONDITION CHECK".
[🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>CONDITION CHECK.](#) [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>CONDITION CHECK.](#)

7. CHECK INPUT SIGNAL FOR TCM.

1. Start the engine.
2. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
3. Depress the brake pedal, and shift the select lever to "D" range.
4. Shift the select lever to "P" range.
5. Stabilize the engine speed at idle.
6. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor.

Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes

[🔗 Go to 8.](#)

No

Perform the diagnosis according to DTC P0841. [🔗 Ref. to TRANSMISSION \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0841 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT RANGE/PERFORMANCE.](#)

8. STALL TEST.

Perform the stall test. [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Stall Test.](#) [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Stall Test.](#)

Is the result of the stall test OK?

Yes


[🔗 Go to 9.](#)

No

Replace the transmission assembly if the stall speed is higher than the standard value of the stall test. [🔗 Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#) [🔗 Ref. to](#)



[CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

9. DRIVING CHECK BY INSPECTION MODE.

1. Turn the ignition switch to OFF.
2. Perform a drive check based on the "Inspection Mode".  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Inspection Mode.](#)

Does the AT OIL TEMP light blink and is DTC P0776 displayed?

Yes

Replace the transmission assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

No

Current condition is normal. It is possible that temporary poor contact occurs.

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect the malfunction of transmission forward/reverse clutch pressure solenoid and hydraulic circuit characteristics (stuck to low pressure side).
- Judge as NG if the value calculated by "turbine speed – primary pulley speed" becomes the predetermined value or more, even though the forward/reverse clutch is engaged.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
Diagnosis 1	
12 V battery system voltage	≥ 10 V
Transmission range	Drive
Measured turbine shaft speed	≥ 100 rpm
Measured primary pulley shaft speed	≥ 100 rpm
Commanded forward & reverse clutch pressure control solenoid current	< 0.9 A
Engine speed	≥ 400 rpm
Diagnosis 2	
12 V battery system voltage	≥ 10 V
Transmission range	Drive
Measured primary pulley shaft speed	< 100 rpm
Accelerator pedal position (from ECM)	> 6%
Commanded forward & reverse clutch pressure control solenoid current	< 0.9 A
Engine speed	≥ 400 rpm

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Diagnosis 1	
Measured turbine shaft speed - Measured primary pulley shaft speed	> Table 1 rpm
Diagnosis 2	
Measured turbine shaft speed	> 2000 rpm

Table 1

Vehicle speed (MPH)	0	13	25	38	50	63	75
Measured turbine shaft speed - Measured primary pulley shaft speed (rpm)	150	100	100	100	100	100	100
Vehicle speed (MPH)	88	100	113	125	138	150	159
Measured turbine shaft speed - Measured primary pulley shaft speed (rpm)	100	100	100	100	100	100	100

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect the malfunction of transmission forward/reverse clutch pressure solenoid and hydraulic circuit characteristics (stuck to low pressure side).
- Judge as NG if the value calculated by “output speed – secondary pulley speed” becomes the predetermined value or more, even though the forward/reverse clutch is engaged.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
Diagnosis 1	
12 V battery system voltage	≥ 10 V
Transmission range	Drive
Measured secondary pulley shaft speed	≥ 100 rpm
Measured output shaft speed	≥ 100 rpm
Commanded forward & reverse clutch pressure control solenoid current	< 0.9 A
Engine speed	≥ 400 rpm
Diagnosis 2	
12 V battery system voltage	≥ 10 V

Transmission range	Drive
Measured output shaft speed	< 100 rpm
Commanded forward & reverse clutch pressure control solenoid current	< 0.9 A
Accelerator pedal position (from ECM)	> 6%
Engine speed	≥ 400 rpm

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Diagnosis 1	
Measured front output shaft speed - Measured secondary pulley shaft speed /1.322	> Table 2 rpm
Diagnosis 2	
Measured secondary pulley shaft speed	> 600 rpm

Table 2

Vehicle speed (MPH)	0	13	25	38	50	63	75
Measured front output shaft speed - Measured secondary pulley shaft speed (rpm)	150	100	100	100	100	100	100

Vehicle speed (MPH)	88	100	113	125	138	150	159
Measured front output shaft speed - Measured secondary pulley shaft speed (rpm)	100	100	100	100	100	100	100

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0801 REVERSE INHIBIT CONTROL CIRCUIT/OPEN

DTC detecting condition:

Immediately at fault recognition

Note:

For diagnostic procedures, refer to "BODY CONTROL SYSTEM (DIAGNOSTICS)".  [Ref. to BODY CONTROL\(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC B1016 SHIFT LOCK CIRCUIT.](#)

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of shift lock solenoid or circuit.
- Judge as NG if abnormal signal from the integrated unit is received, when bus off is not detected and there is no trouble in CAN between the integrated unit.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
None	

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Shift lock solenoid system circuit abnormal (received from BIU)	ON

Time needed for diagnosis: 1 second

Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0841 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Acceleration is poor during standing start.
- Shift control malfunction
- Engine speed increases abruptly.

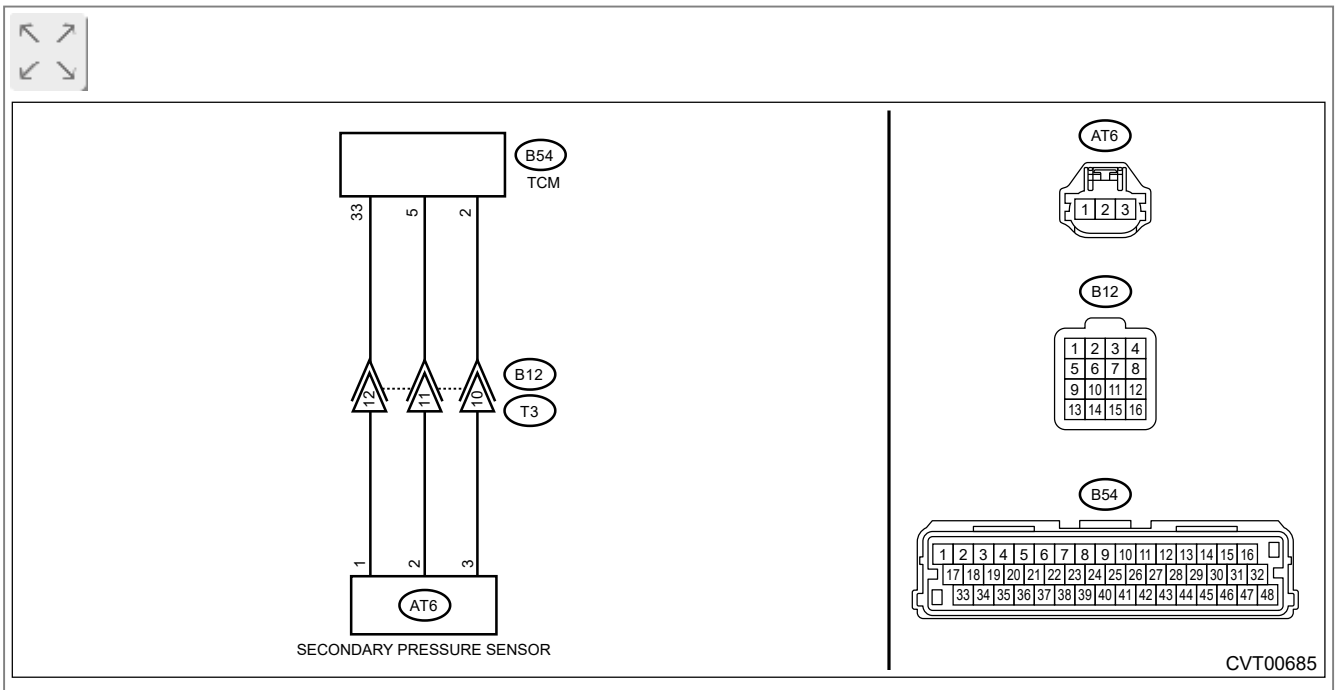
Caution:

- **Before performing diagnosis, record the freeze frame data.**
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**

Wiring diagram:

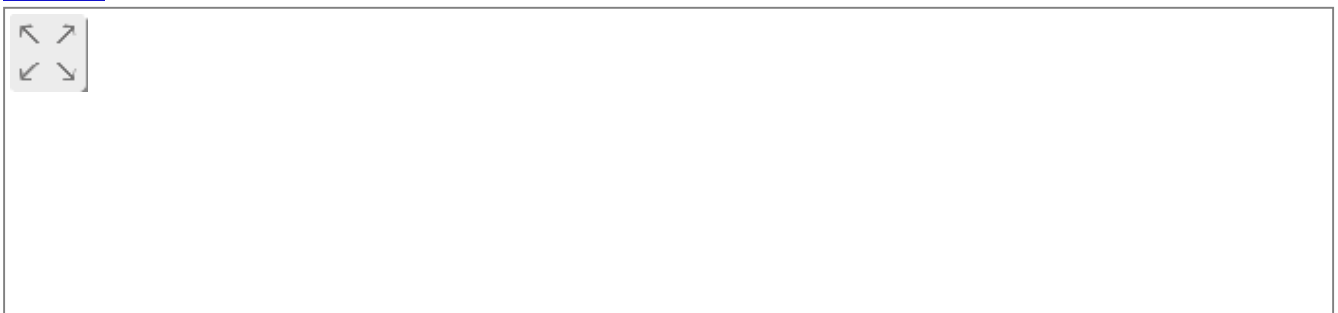
- Non-turbo model

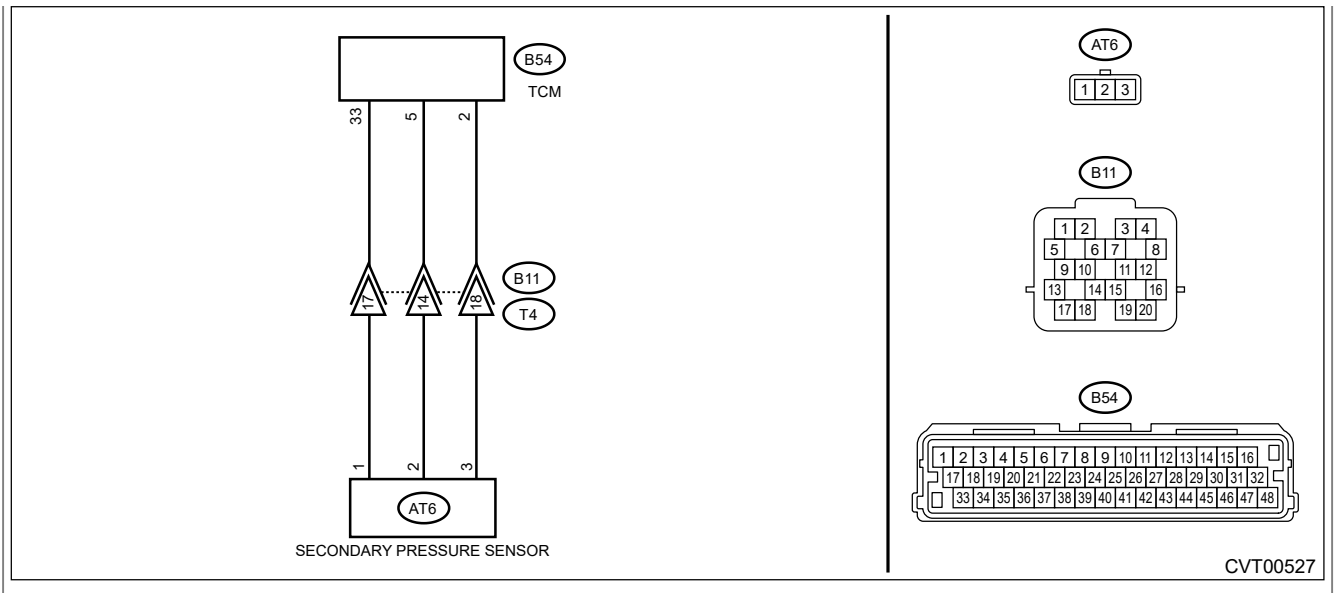
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model

CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK DTC.

Read the DTC using Subaru Select Monitor.

Are DTCs other than P0841 displayed?

Yes

Perform the diagnosis according to DTC. After the diagnosis, start the engine, and drive for 20 minutes in any driving pattern. (Include driving at a constant legal speed (for 20 seconds) at least once.) Read the DTC, and if P0841 alone is detected, [Go to 2.](#)

No

[Go to 2.](#)

2. CHECK INPUT SIGNAL FOR TCM.

1. Turn the ignition switch to ON.
2. Read the data of [secondary pressure sensor voltage.] using Subaru Select Monitor. (While shaking the secondary pressure sensor harness)

Is [secondary pressure sensor voltage.] 0.39 — 0.61 V?

Yes

[Go to 10.](#)

No

[Go to 3.](#)

3. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the secondary pressure sensor connector.
4. Measure the resistance between TCM connector and secondary pressure sensor connector.

Connector & terminal


(B54) No. 2 — (AT6) No. 3:

(B54) No. 5 — (AT6) No. 2:

(B54) No. 33 — (AT6) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Repair the open circuit of harness.

4. CHECK HARNESS.



Measure the resistance between TCM connectors.

Connector & terminal

(B54) No. 2 — (B54) No. 33:

(B54) No. 5 — (B54) No. 2:

(B54) No. 33 — (B54) No. 5:

Is the resistance 1 M Ω or more?

Yes

 [Go to 5.](#)

No

Repair the short circuit of harness.

5. CHECK HARNESS.



Measure the resistance between TCM connector and transmission body.

Connector & terminal

(B54) No. 2 — Transmission body:

(B54) No. 5 — Transmission body:

(B54) No. 33 — Transmission body:

Is the resistance 1 M Ω or more?

Yes

 [Go to 6.](#)

No

Repair the short circuit of harness.

6. CHECK POWER SUPPLY FOR SECONDARY PRESSURE SENSOR.



1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connectors.

Connector & terminal

(B54) No. 33 (+) — (B54) No. 2 (-):

Is the voltage 4.6 — 5.4 V?

Yes

[Go to 7.](#)

No

Check for poor contact of connector, and if no fault is found, replace the TCM. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

7. CHECK POWER SUPPLY FOR SECONDARY PRESSURE SENSOR.



1. Turn the ignition switch to OFF.
2. Connect the secondary pressure sensor connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between TCM connectors.

Connector & terminal

(B54) No. 33 (+) — (B54) No. 2 (-):

Is the voltage 4.6 — 5.4 V?

Yes

[Go to 8.](#)

No

Replace the secondary pressure sensor. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Secondary Pressure Sensor.](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Secondary Pressure Sensor.](#)

8. CHECK SECONDARY PRESSURE SENSOR OUTPUT.



Measure the voltage between TCM connectors.


Connector & terminal

(B54) No. 5 (+) — (B54) No. 2 (-):

Is the voltage 0.39 — 0.61 V?

Yes

Check for poor contact of connector, and if no fault is found, replace the TCM. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control](#)

[Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

 [Go to 9.](#)

9. CHECK CONNECTOR.


1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the secondary pressure sensor connector.
4. Check the TCM connector (B54) and the secondary pressure sensor connector (AT6).

Is there any fault in the TCM connector or the secondary pressure connector?



Yes

Repair the connector, or replace harness.

No

 [Go to 10.](#)

10. CHECK TRANSMISSION FLUID.




1. Connect all connectors.
2. Check the amount of ATF.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>ADJUSTMENT.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>ADJUSTMENT.](#)

Is the check result OK?


Yes

 [Go to 11.](#)

No

Adjust the amount of ATF.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>ADJUSTMENT.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>ADJUSTMENT.](#)  [Go to 11.](#)

11. CHECK INPUT SIGNAL FOR TCM.

1. Clear the memory.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Clear memory.](#)
2. Start the engine.
3. Warm up until the ATF temperature reaches to 40 – 70°C (104 – 158°F).
4. Depress the brake pedal and move the select lever to each range at an interval of five seconds.


Note:

Move the select lever in the following order: "P" → "R" → "N" → "D" → "N" → "R" → "P".



5. Stabilize the engine speed at idle.
6. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor.

Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes

 [Go to 12.](#)

No


Replace the secondary pressure sensor.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Secondary Pressure Sensor.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Secondary Pressure Sensor.](#)

12. CHECK INPUT SIGNAL FOR TCM.



1. Shift the select lever to "P" range.
2. Keep the engine speed at 3,000 rpm.
3. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor.

Is [Actual Secondary Pressure] 1.5 — 2.5 MPa? And is the difference of the actual oil pressure 0.2 MPa or more compared with the value measured in step 11?

Yes


 [Go to 13.](#)

No



Replace the secondary pressure sensor.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Secondary Pressure Sensor.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Secondary Pressure Sensor.](#)

13. CHECK FREEZE FRAME DATA.

1. Turn the ignition switch to OFF.
2. Check the recorded freeze frame data.

Was the detected symptom low-voltage malfunction?  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0841 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT RANGE/PERFORMANCE > CLASSIFICATION OF SYMPTOM USING FREEZE FRAME DATA.](#)

Yes

Replace the transmission assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

No

 [Go to 14.](#)



14. CHECK TCM INPUT SIGNAL (STALL TEST).




1. Lift up the vehicle.
2. Start the engine.
3. Apply the parking brake.
4. Set the select lever to "D" range.
5. Depress the brake pedal firmly.
6. Slowly open the accelerator fully, and stabilize the engine speed.
7. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor.

Is [Actual Secondary Pressure] 4.5 — 6.0 MPa?

Yes

Replace the transmission assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

No

 [Go to 15.](#)



15. CHECK INPUT SIGNAL FOR TCM.





Check the [Actual Secondary Pressure] in step 14.

Is [Actual Secondary Pressure] 4.5 MPa or less?

Yes

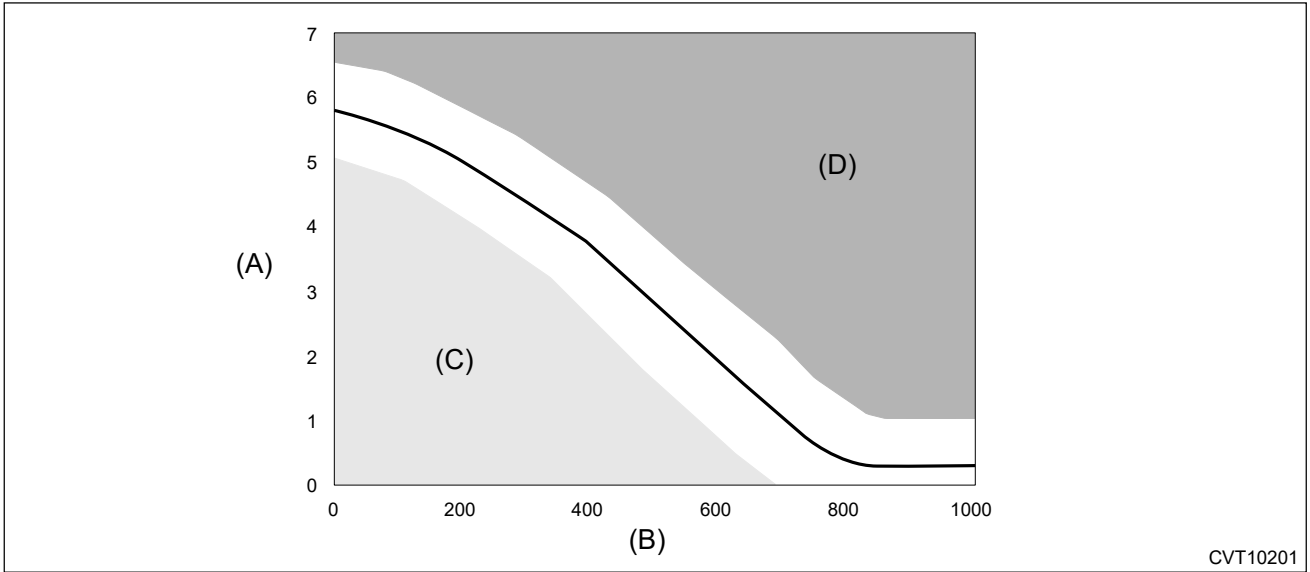
Replace the transmission assembly.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Automatic Transmission Assembly.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Automatic Transmission Assembly.](#)

No

Replace the control valve body.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

1. CLASSIFICATION OF SYMPTOM USING FREEZE FRAME DATA

Apply the values of [Actual Secondary Pressure] and [Secondary Actual Current] recorded in the freeze frame data onto the graph shown in the following figure, and judge if either low-voltage malfunction or high-voltage malfunction occurs.



- (A) Actual secondary pressure (MPa) (C) Low-voltage malfunction (D) High-voltage malfunction
- (B) Secondary actual current (mA)

Note:

Symptom that the DTC P0841 illuminates can be classified into 2 patterns.

- Low-voltage malfunction: detected due to insufficient oil pressure
- High-voltage malfunction: detected due to excessive oil pressure

2. OUTLINE OF DIAGNOSIS

- Detect the malfunction of transmission fluid pressure control function.
- Judge as NG if a discrepancy between the target secondary oil pressure (as internal data) and the detected value of the secondary oil pressure sensor becomes the specified value or more.

3. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Engine speed	≥ Table 1 rpm

Table 1: Non-turbo model

Target line pressure (kPa)	0	500	1000	1500	2000	3000	4000	5000	6000
Engine speed (rpm)	300	660	900	1080	1170	1400	1680	1900	2100

Table 1: Turbo model

Target line pressure (kPa)	0	500	1000	1500	2000	3000	4000	5000	6000
Engine speed (rpm)	400	600	965	1180	1370	1670	1930	2150	2340

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Target line pressure – Measured line pressure	≥ 500 kPa

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0842 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition


Trouble symptom:

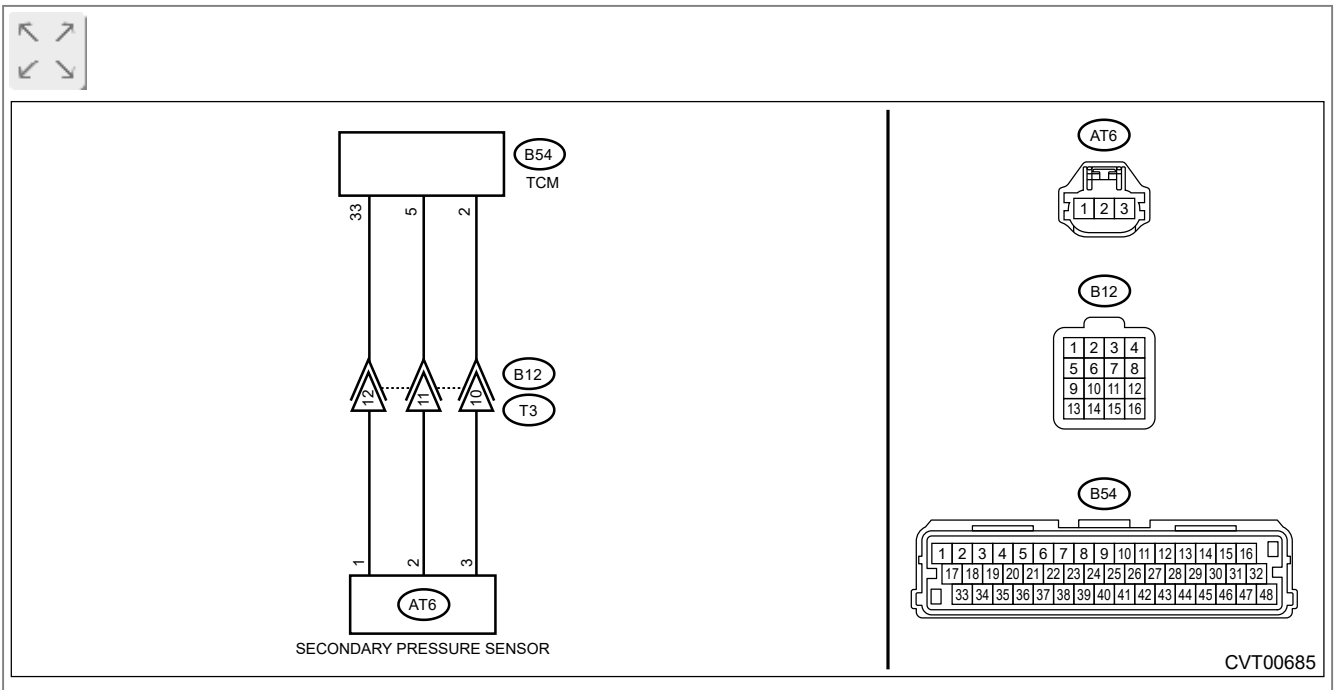
Shift characteristics malfunction


Caution:

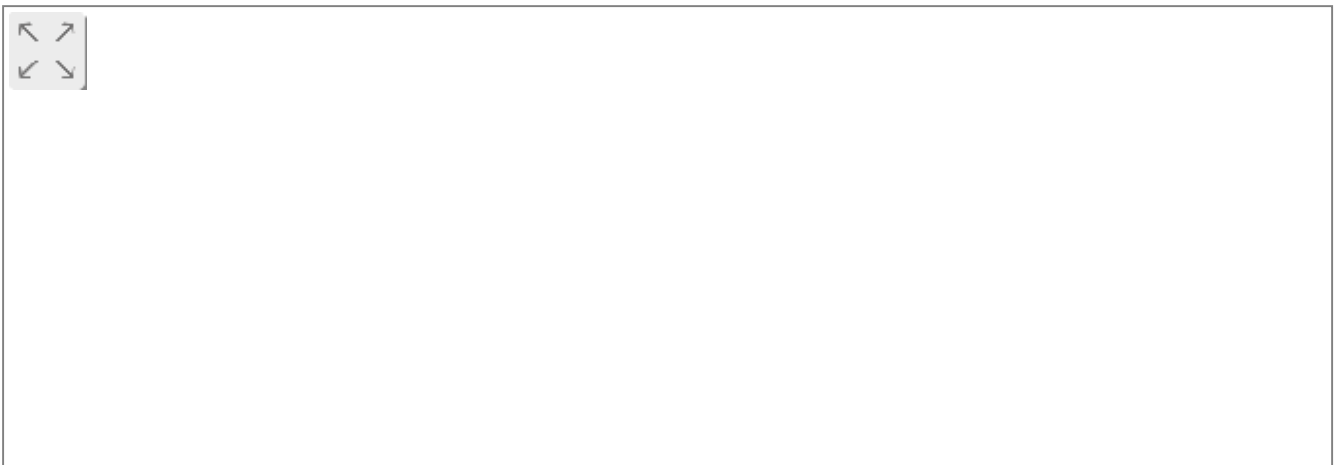
Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

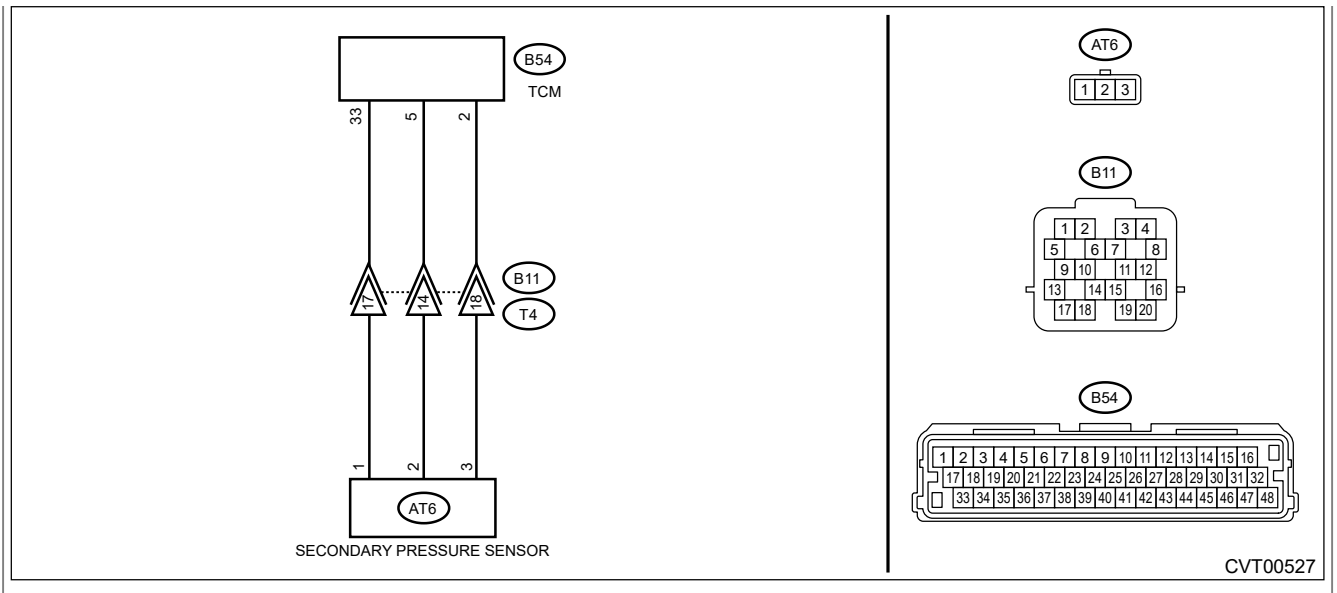
Wiring diagram:

- Non-turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK INPUT SIGNAL FOR TCM.

1. Start the engine.
2. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
3. Depress the brake pedal, and shift the select lever to "D" range.
4. Shift the select lever to "P" range.
5. Stabilize the engine speed at idle.
6. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor.

Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes

Check for poor contact of connector.

No

 [Go to 2.](#)

2. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Measure the resistance between TCM connector and transmission connectors.

Connector & terminal

Non-turbo model

- (B54) No. 2 — (B12) No. 10:
- (B54) No. 5 — (B12) No. 11:
- (B54) No. 33 — (B12) No. 12:


Turbo model

- (B54) No. 2 — (B11) No. 18:

(B54) No. 5 — (B11) No. 14:
(B54) No. 33 — (B11) No. 17:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit of harness.

3. CHECK HARNESS.



Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(B54) No. 5 — Chassis ground:

(B54) No. 33 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair the short circuit of harness.

4. CHECK TRANSMISSION HARNESS.



1. Disconnect the secondary pressure sensor connector.
2. Measure the resistance between transmission connector and secondary pressure sensor connector.

Connector & terminal

Non-turbo model

(T3) No. 10 — (AT6) No. 3:

(T3) No. 11 — (AT6) No. 2:

(T3) No. 12 — (AT6) No. 1:

Turbo model

(T4) No. 14 — (AT6) No. 2:

(T4) No. 17 — (AT6) No. 1:

(T4) No. 18 — (AT6) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 5.](#)

No

Repair the open circuit of harness.

5. CHECK TRANSMISSION HARNESS.



Measure the resistance between transmission connector and chassis ground.

Connector & terminal

Non-turbo model

(T3) No. 11 — Chassis ground:

(T3) No. 12 — Chassis ground:


Turbo model

(T4) No. 14 — Chassis ground:

(T4) No. 17 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 6.](#)

No

Repair the short circuit of harness.

6. CHECK POWER SUPPLY FOR SECONDARY PRESSURE SENSOR.







1. Connect the TCM connector.
2. Connect the transmission connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between secondary pressure sensor connector terminals.

Connector & terminal



(AT6) No. 1 (+) — (AT6) No. 3 (-):

Is the voltage 4.5 V or more?

Yes

Replace the secondary pressure sensor.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Secondary Pressure Sensor.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Secondary Pressure Sensor.](#) If the replacement of the sensor do not eliminate the malfunction, replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

Check for poor contact of connector, and if no fault is found, replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

1. OUTLINE OF DIAGNOSIS

- Detect the GND-output short circuit of the secondary pressure sensor.

- Judge as NG if the voltage detected by the secondary pressure sensor is lower than the predetermined value.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	$\geq 9 \text{ V}$

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured line pressure sensor input voltage	$< 0.195 \text{ V}$
(Line pressure)	$(< - 574 \text{ kPa})$

Time needed for diagnosis: 0.5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0843 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition


Trouble symptom:

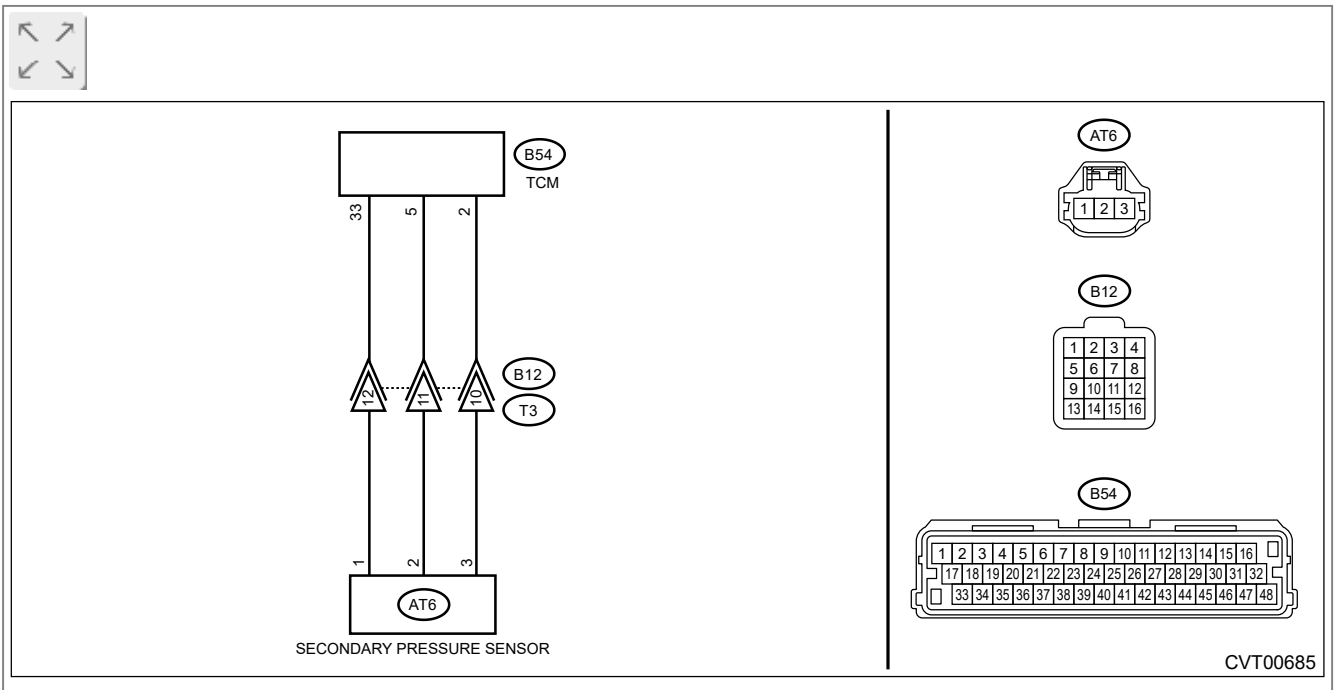
Shift characteristics malfunction


Caution:

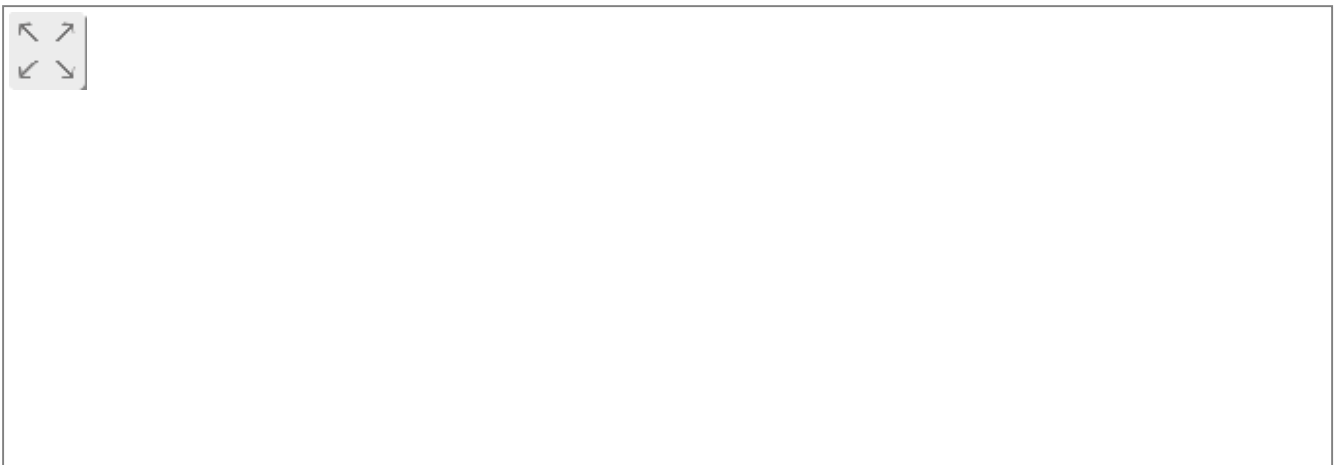
Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

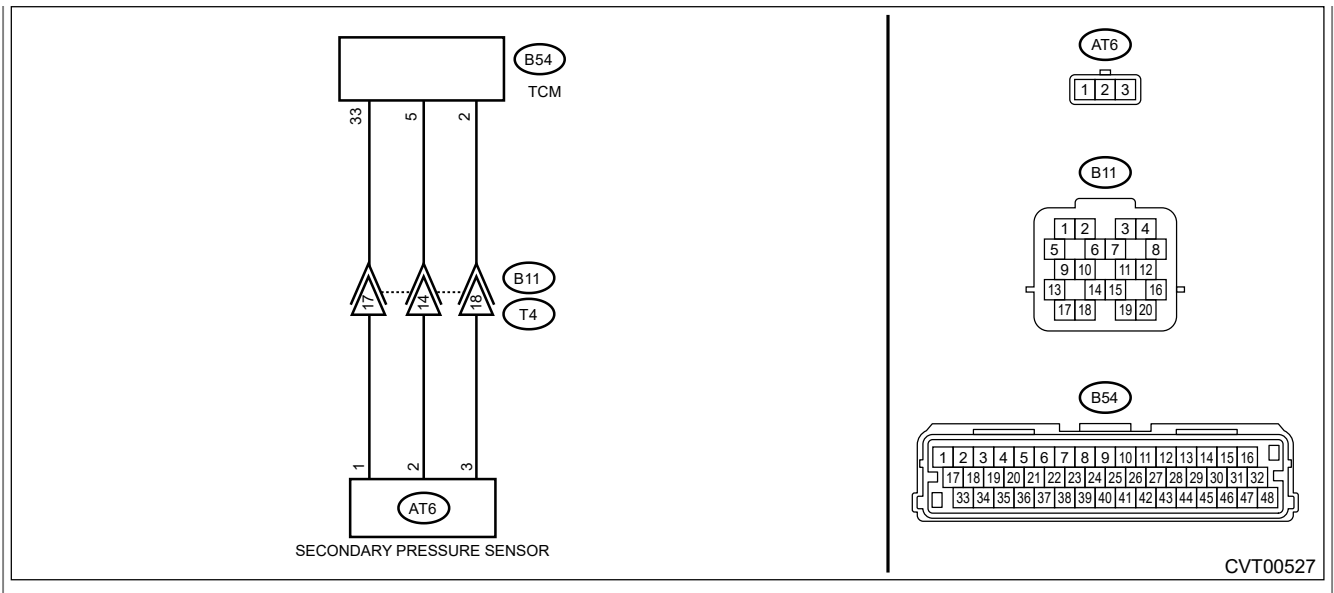
Wiring diagram:

- Non-turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK INPUT SIGNAL FOR TCM.

1. Start the engine.
2. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
3. Depress the brake pedal, and shift the select lever to "D" range.
4. Shift the select lever to "P" range.
5. Stabilize the engine speed at idle.
6. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor.

Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes

Check for poor contact of connector.

No

 [Go to 2.](#)

2. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Turn the ignition switch to ON.
5. Measure the voltage between TCM connector and chassis ground.

Connector & terminal


(B54) No. 5 (+) — Chassis ground (—):

(B54) No. 33 (+) — Chassis ground (—):

Is the voltage approx. 0 V?



Yes

 [Go to 3.](#)

No

Repair the short circuit of harness.

3. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Measure the resistance between TCM connector terminals.

Connector & terminal


(B54) No. 5 – (B54) No. 33:

Is the resistance less than 1 Ω ?

Yes

Repair the short circuit of harness.

No

 [Go to 4.](#)

4. CHECK TRANSMISSION HARNESS.

1. Disconnect the secondary pressure sensor connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between transmission connector and chassis ground.

Connector & terminal

Non-turbo model

(T3) No. 11 (+) – Chassis ground (-):

(T3) No. 12 (+) – Chassis ground (-):

Turbo model

(T4) No. 14 (+) – Chassis ground (-):

(T4) No. 17 (+) – Chassis ground (-):

Is the voltage approx. 0 V?

Yes

 [Go to 5.](#)

No

Repair the short circuit of harness.

5. CHECK TRANSMISSION HARNESS.

1. Turn the ignition switch to OFF.
2. Measure the resistance between transmission connector terminals.

Connector & terminal

Non-turbo model

(T3) No. 11 – (T3) No. 12:

Turbo model

(T4) No. 14 – (T4) No. 17:

Is the resistance less than 1 Ω ?

Yes

Repair the short circuit of harness.

No

 [Go to 6.](#)

6. CHECK POWER SUPPLY FOR SECONDARY PRESSURE SENSOR.





1. Connect the TCM connector.
2. Connect the transmission connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between secondary pressure sensor connector terminals.

Connector & terminal



(AT6) No. 1 (+) – (AT6) No. 3 (–):

Is the voltage 4.5 V or more?

Yes

Replace the secondary pressure sensor.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Secondary Pressure Sensor.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Secondary Pressure Sensor.](#) If the replacement of the sensor do not eliminate the malfunction, replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

Check for poor contact of connector, and if no fault is found, replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

1. OUTLINE OF DIAGNOSIS

- Detect power supply-output short circuit or open circuit of the secondary pressure sensor 5 V system.
- Judge as NG if the voltage detected by the secondary pressure sensor is higher than the predetermined value.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 9 V

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured line pressure sensor input voltage	> 4.883 V
(Line pressure)	(> 8200 kPa)

Time needed for diagnosis: 1.5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0890 TCM POWER RELAY SENSE CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

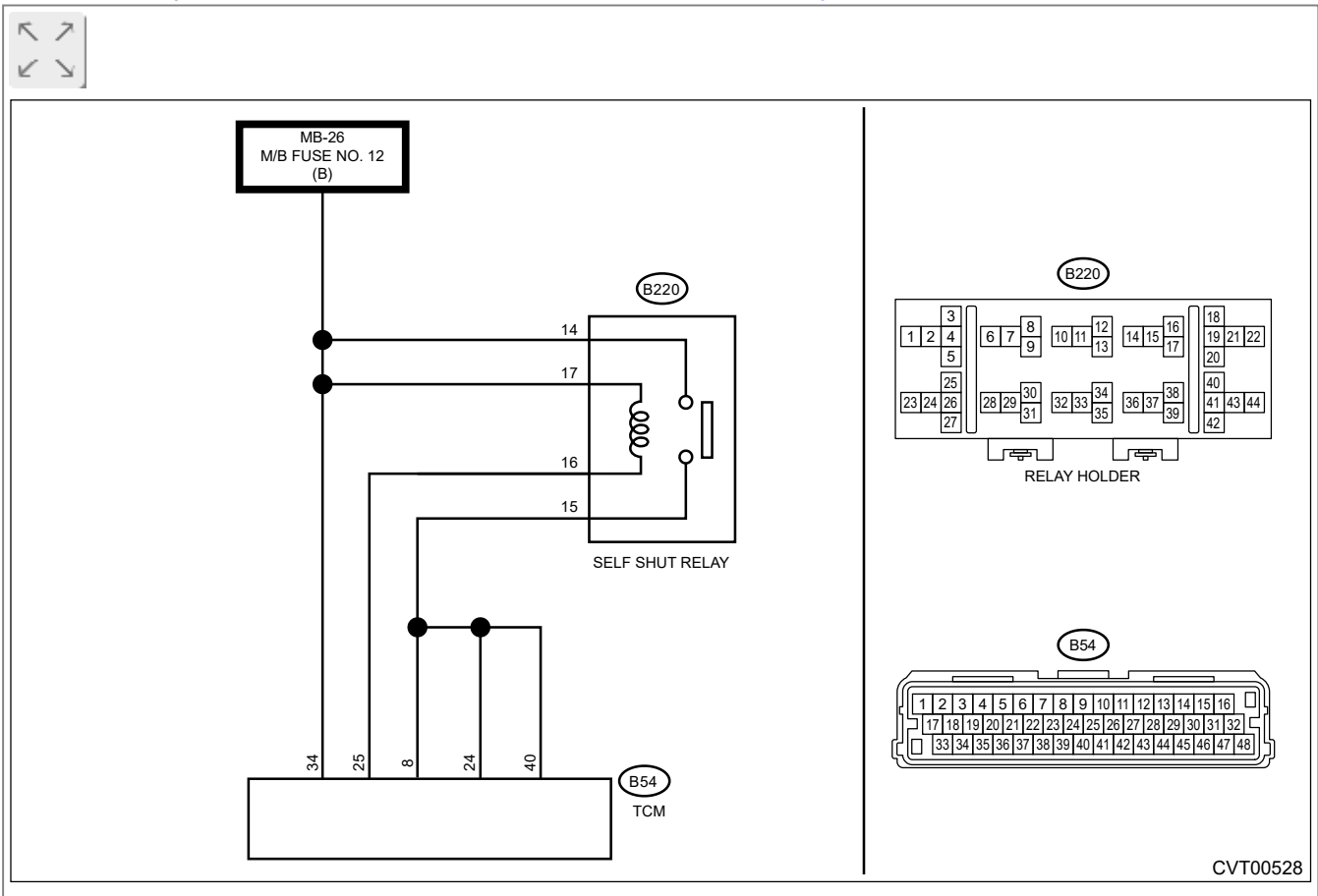
Gear is not changed.

Caution:

- After diagnosis, perform Clear Memory Mode for ECM. [Ref. to ENGINE \(DIAGNOSTICS\)\(H4DOTC\)>Clear Memory Mode.](#) [Ref. to ENGINE \(DIAGNOSTICS\) \(H4DO\)>Clear Memory Mode.](#)
- Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

Wiring diagram:

CVT control system [Ref. to WIRING SYSTEM>CVT Control System.](#)



1. CHECK HARNESS.

1. Disconnect the TCM connector.
2. Remove the self shut relay.
3. Measure the resistance between TCM connector and relay holder.

Connector & terminal

(B54) No. 25 — (B220) No. 16:


(B54) No. 8 — (B220) No. 15:

(B54) No. 24 — (B220) No. 15:

(B54) No. 40 — (B220) No. 15:

Is the resistance less than 1 Ω ?

Yes

 [Go to 2.](#)

No

Repair the open circuit of harness.

2. CHECK HARNESS.



Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(B54) No. 25 — Chassis ground:

(B54) No. 8 — Chassis ground:

(B54) No. 24 — Chassis ground:

(B54) No. 40 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 3.](#)

No

Repair the short circuit of harness.

3. CHECK RELAY POWER SUPPLY.



Measure the voltage between relay holder and chassis ground.

Connector & terminal

(B220) No. 14 (+) — Chassis ground (-):

(B220) No. 17 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 4.](#)

No

Repair the open or short circuit of harness.

4. CHECK SELF SHUT RELAY.




Measure the resistance between self shut relay terminals.

Terminals

No. 16 — No. 17:

Is the resistance 110 — 140 Ω ?

Yes

 [Go to 5.](#)

No

Replace the self shut relay.

5. CHECK SELF SHUT RELAY.

Measure the resistance between self shut relay terminals.

Terminals

No. 14 — No. 15:

Is the resistance 1 M Ω or more?

Yes

 [Go to 6.](#)

No

Replace the self shut relay.

6. CHECK INPUT SIGNAL FOR TCM.

1. Connect the TCM connector.
2. Install the self shut relay.
3. Read the data of [Control Module Voltage] using Subaru Select Monitor.

Is [Control Module Voltage] 10 V or more?

Yes

Current condition is normal. Check for poor contact in connectors or harnesses, and repair the defective part.

No



 [Go to 7.](#)

7. CHECK SELF SHUT RELAY.

1. Turn the ignition switch to OFF.
2. Replace the self shut relay.
3. Clear the memory.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Clear memory.](#)
4. Read the DTC.

Is DTC P0890 displayed?

Yes

Replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

The original self shut relay is defective.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of transmission fluid pressure solenoid drive power supply relay circuit.
- Judge as NG if the transmission fluid pressure solenoid drive power supply voltage is lower than the predetermined value.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	$\geq 9 \text{ V}$
Ignition state	Run or Crank

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured TCM input voltage which is supplied from 12 V battery system through the TCM Power Relay	$< 2 \text{ V}$

Time needed for diagnosis: 0.5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0951 AUTO SHIFT MANUAL CONTROL CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

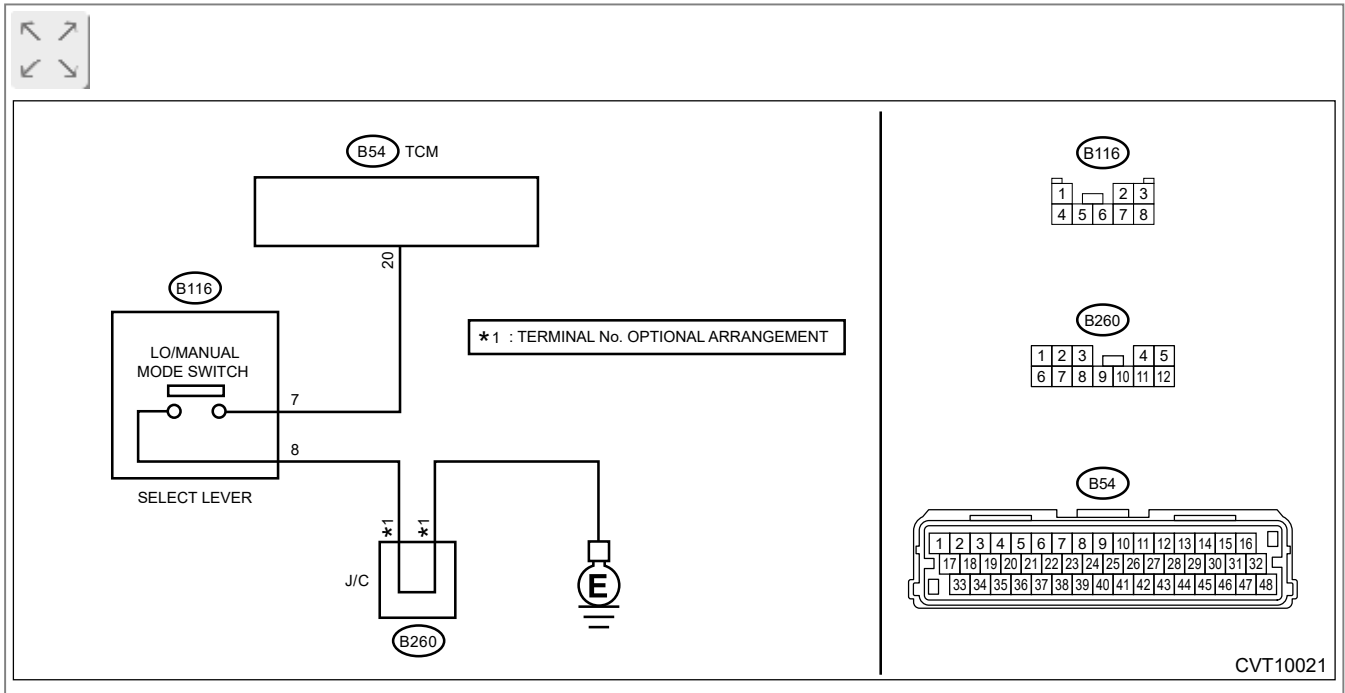
Manual mode can not be set.

Caution:

Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

Wiring diagram:

CVT control system  Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK HARNESS.


1. Turn the ignition switch to OFF.
2. Disconnect the manual mode switch connector.
3. Measure the resistance between manual mode switch connector and chassis ground.

Connector & terminal

(B116) No. 8 — Chassis ground:

Is the resistance less than 1 Ω?

Yes

 Go to 2.

No

Repair the open circuit of harness.

2. CHECK MANUAL MODE SWITCH.


Measure the resistance between manual mode switch terminals.

Terminals

No. 7 — No. 8:

Is the resistance 1 M Ω or more?

Yes

 [Go to 3.](#)

No

Replace the select lever assembly.  [Ref. to CONTROL SYSTEMS>Select Lever.](#)

3. CHECK MANUAL MODE SWITCH.

1. Shift the select lever to manual mode.
2. Measure the resistance between manual mode switch terminals.

Terminals

No. 7 — No. 8:

Is the resistance less than 1 Ω ?

Yes

 [Go to 4.](#)

No

Replace the select lever assembly.  [Ref. to CONTROL SYSTEMS>Select Lever.](#)

4. CHECK HARNESS.


1. Disconnect the TCM connector.
2. Measure the resistance between TCM connector and manual mode switch connector.

Connector & terminal

(B54) No. 20 — (B116) No. 7:

Is the resistance less than 1 Ω ?

Yes

 [Go to 5.](#)

No

Repair the open circuit of harness or poor contact of connector.

5. CHECK HARNESS.


Measure the resistance between manual mode switch connector and chassis ground.

Connector & terminal

(B116) No. 7 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 6.](#)

No

Repair the short circuit of harness.

6. CHECK INPUT SIGNAL FOR TCM.



1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Set the select lever to "D" range.
4. Read the data of [Manual Mode Switch] using Subaru Select Monitor.

Does [Manual Mode Switch] display "ON" with select lever in manual mode, and "OFF" with select lever in other than manual mode?

Yes

Current condition is normal.

No

 [Go to 7.](#)

7. CHECK FOR POOR CONTACT.





Is there poor contact of the manual mode switch circuit?

Yes

Repair the poor contact.

No

Replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

1. OUTLINE OF DIAGNOSIS

- Detect the GND-output short (ground-fault) in manual SW circuit.
- Judge as NG if the manual SW is ON in P, R or N range.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
----------------------	---------------------

D range SW	OFF
------------	-----

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Manual SW	ON

Time needed for diagnosis: 5 s

Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0961 PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT RANGE/PERFORMANCE


DTC detecting condition:

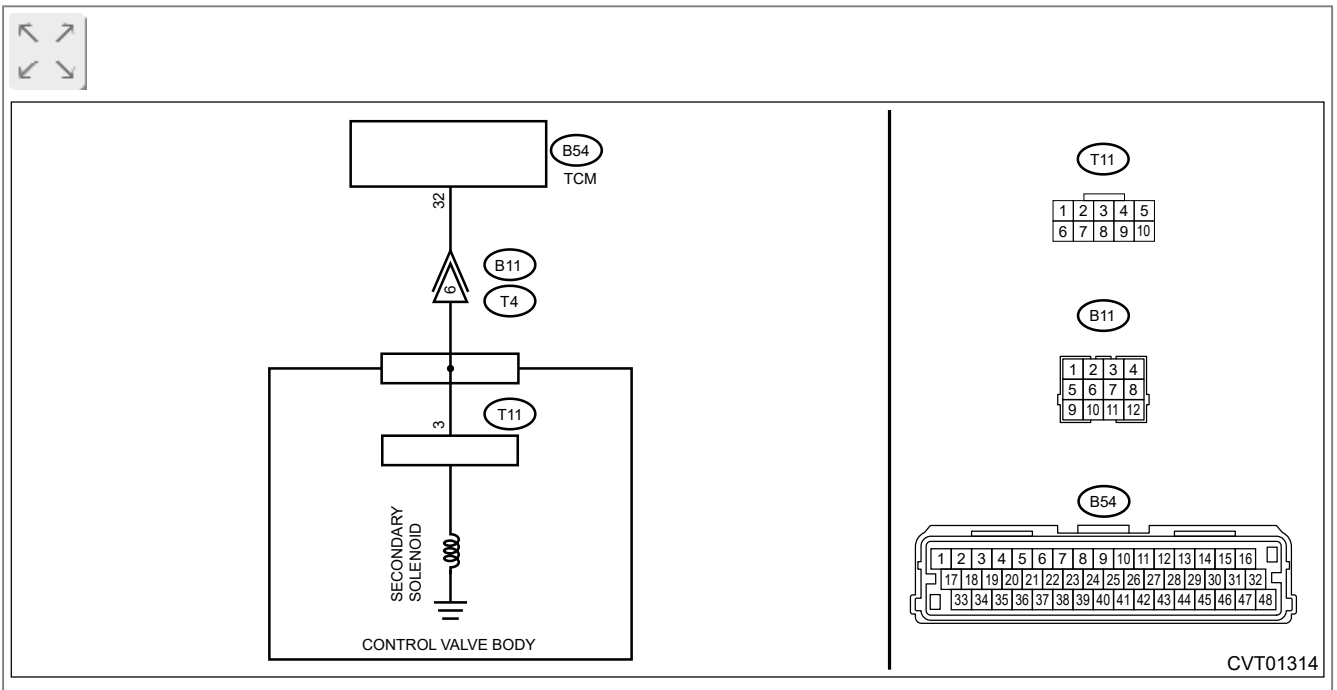
Immediately at fault recognition


Trouble symptom:

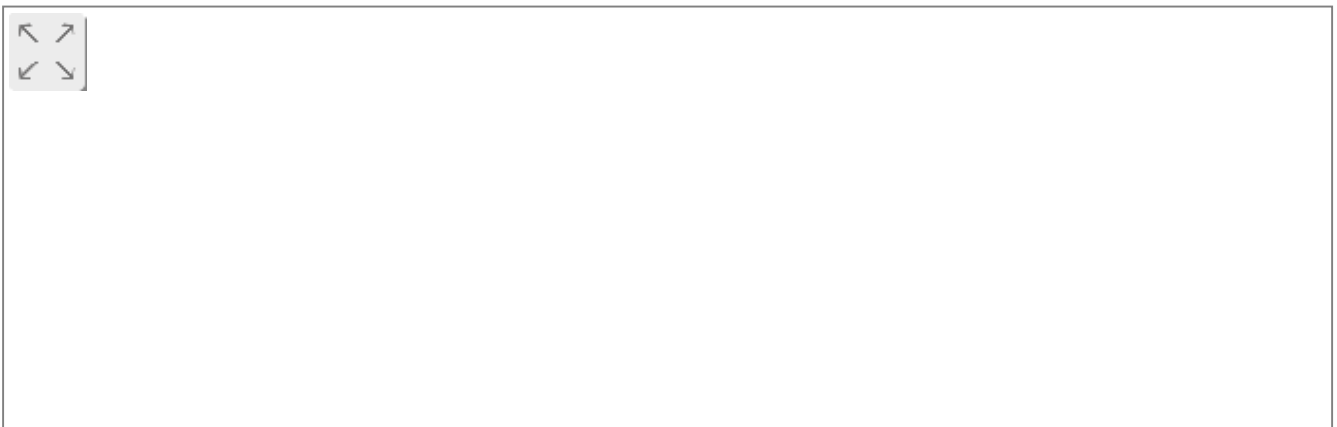
- Acceleration is poor during standing start.
- Shift control malfunction
- Engine speed increases abruptly.

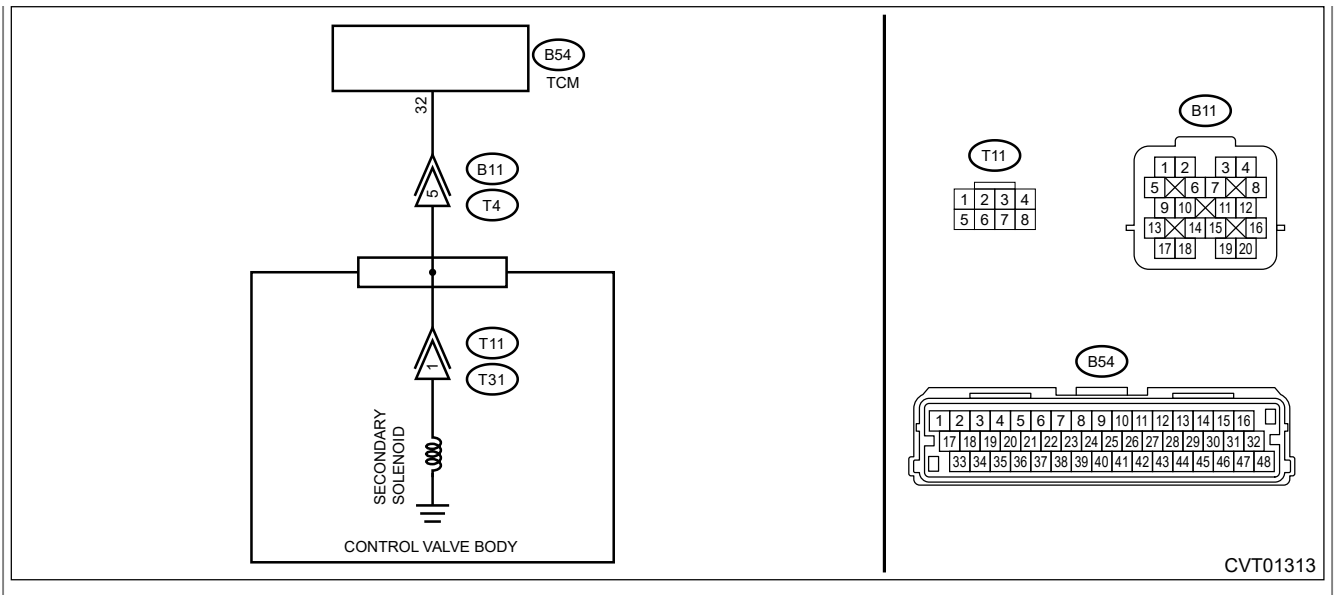
Wiring diagram:

- Non-turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK DTC.

Read the DTC using Subaru Select Monitor.

Besides DTC P0961, is DTC P0962 or P0963 displayed?

Yes

Perform the diagnosis according to DTCs other than P0961.

No

[Go to 2.](#)

2. CHECK SECONDARY SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform forced operation of the secondary solenoid. [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Active Test.](#)

Is 300 → 500 → 700 mA indicated at forced operation, and does [Secondary Actual Current] follow [Secondary Set Current]?

Yes

[Go to 3.](#)

No

[Go to 4.](#)

3. CHECK FOR POOR CONTACT.



Check for poor contact of harness and connector between TCM and secondary solenoid.

Is there poor contact?

Yes

Repair the poor contact of harness and connector.

No

Recheck the poor contact of harness and connector. Replace the TCM if no fault is found.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

4. CHECK SECONDARY SOLENOID.

1. Turn the ignition switch to OFF.
2. Disconnect the transmission connector.
3. Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model



(T4) No. 6 — Transmission body:

Turbo model

(T4) No. 5 — Transmission body:

Is the resistance approximately 5 — 7 Ω ? (when cold)

Yes

Replace the control valve body.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

No

Repair or replace the harness.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of transmission line pressure solenoid drive circuit.
- Judge as NG when the deviation between target current and actual current of the transmission line pressure solenoid becomes equal to or larger than the predetermined value.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 9 V

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value

Target line pressure control solenoid valve current – Measured line pressure control solenoid valve current	> 0.2 A
--	---------

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0962 PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Engine speed increases abruptly, and can not start.
- Engine speed increases abruptly during driving.

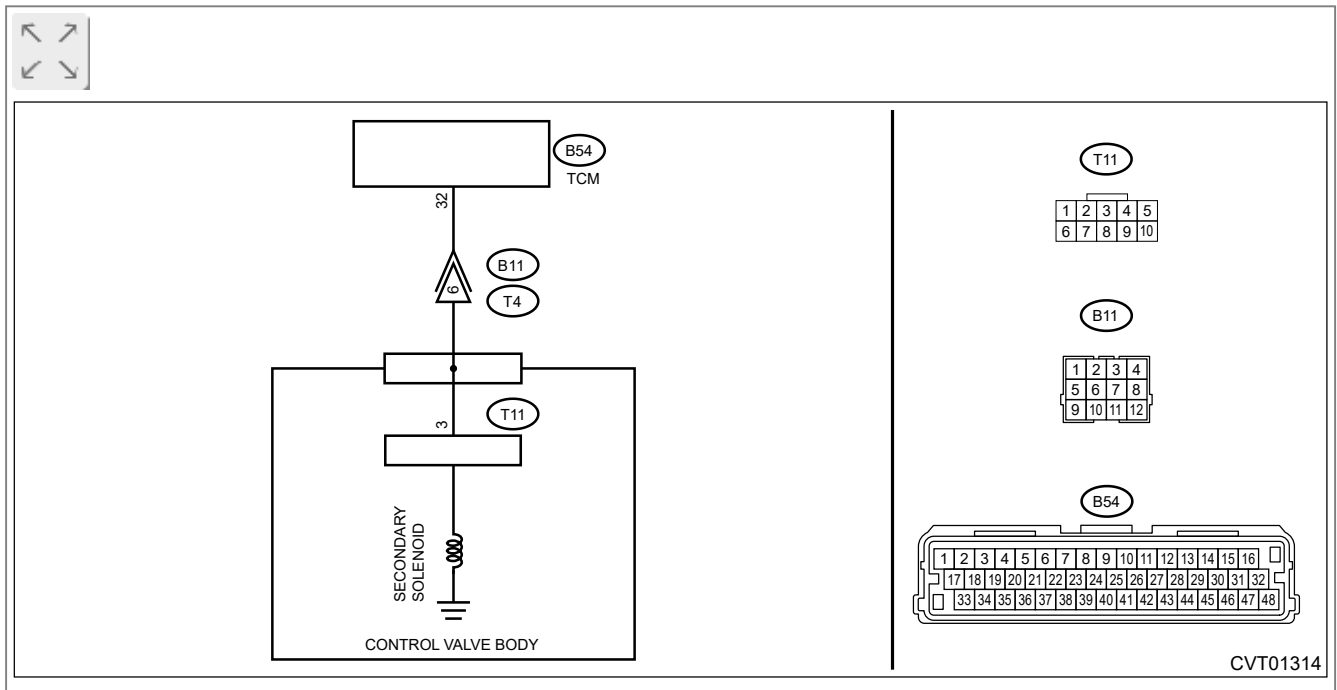
Caution:

Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

Wiring diagram:

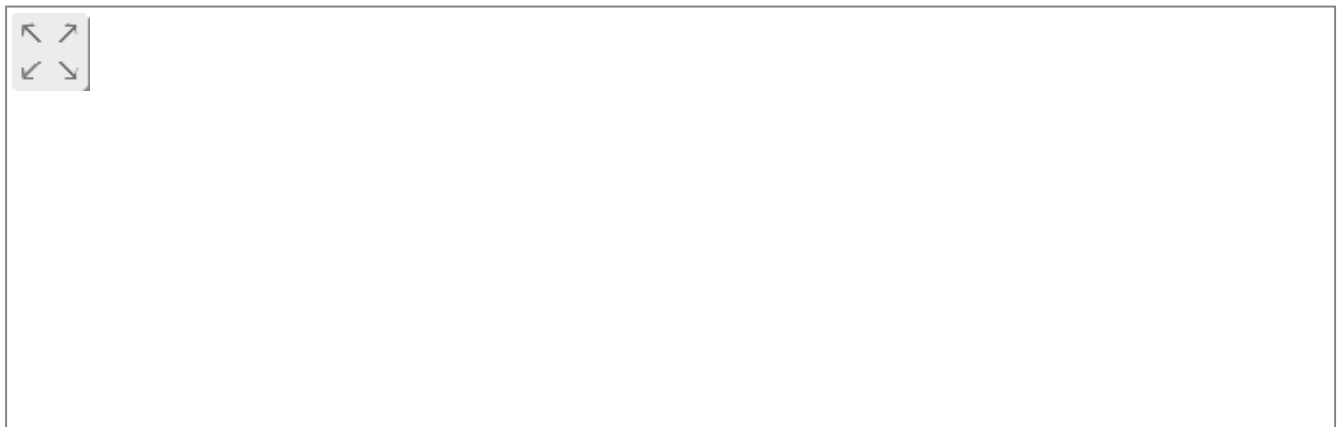
- Non-turbo model

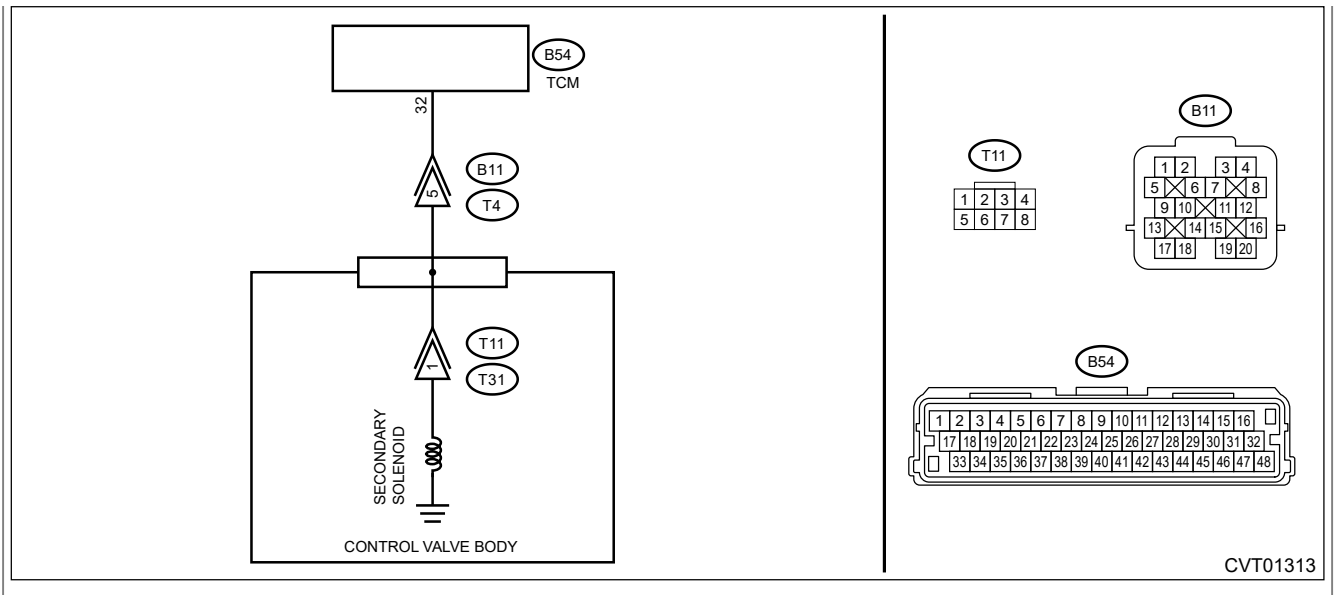
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model

CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK INPUT SIGNAL FOR TCM.

1. After driving with warm up condition, park the vehicle while depressing the brake pedal at "N" range.
2. Using Subaru Select Monitor, read the data of [Secondary Set Current] and [Secondary Actual Current].

Do [Secondary Set Current] and [Secondary Actual Current] almost match?

Yes

Check for poor contact of connector.

No

[Go to 2.](#)

2. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(B54) No. 32 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

[Go to 3.](#)

No

Repair the short circuit of harness.

3. CHECK SECONDARY SOLENOID.



Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model

(T4) No. 6 — Transmission body:

Turbo model

(T4) No. 5 — Transmission body:

Is the resistance approximately 5 — 7 Ω ? (when cold)

Yes

Check for poor contact of connector, and if no fault is found, replace the TCM. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

[Go to 4.](#)

4. CHECK HARNESS INSIDE TRANSMISSION.



Caution:

Start work after ATF cools down.

1. Remove the following parts.
 - Transmission valve cover (non-turbo model)
 - Transmission oil pan (turbo model)
2. Check for the harness pinch, damage.

Is there any fault in the harness?

Yes

Replace the transmission harness.

No

[Go to 5.](#)

5. CHECK HARNESS INSIDE TRANSMISSION.



1. Disconnect the control valve body connector.
2. Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model



(T4) No. 6 — Transmission body:

Turbo model

(T4) No. 5 — Transmission body:

Is the resistance 1 MΩ or more?

Yes

Replace the control valve body.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

No

Replace the transmission harness.

1. OUTLINE OF DIAGNOSIS

Diagnosis 1

- Detect the ground short of the transmission line pressure solenoid drive circuit.
- Judge as NG if the transmission line pressure solenoid drive current is higher than the predetermined value.

Diagnosis 2

- Detect the ground short of the transmission line pressure solenoid drive circuit.
- Judge as NG when an abnormal signal is received from the solenoid driver IC of the transmission line pressure solenoid drive circuit.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Diagnosis 1	
12 V battery system voltage	≥ 9 V
Commanded line pressure control solenoid valve current	≥0.1 A
Diagnosis 2	
12 V battery system voltage	≥ 9 V

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Diagnosis 1	
Measured line pressure control solenoid valve current	≥1.1 A
Diagnosis 2	
Signal of malfunction from solenoid driver IC	ON
As defined by: Measured line pressure control solenoid valve current ≥1.2 A	

Time needed for diagnosis: 0.5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0963 PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition


Trouble symptom:

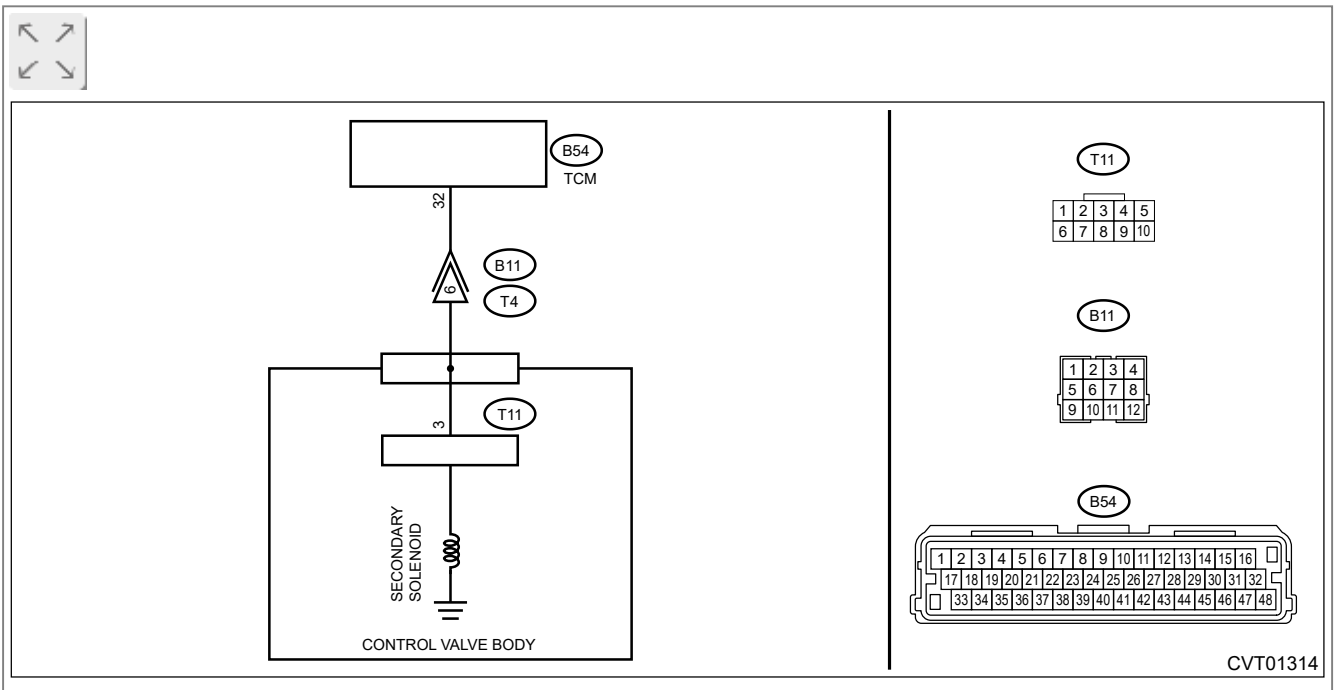
- Engine speed increases abruptly, and can not start.
- Engine speed increases abruptly during driving.


Caution:

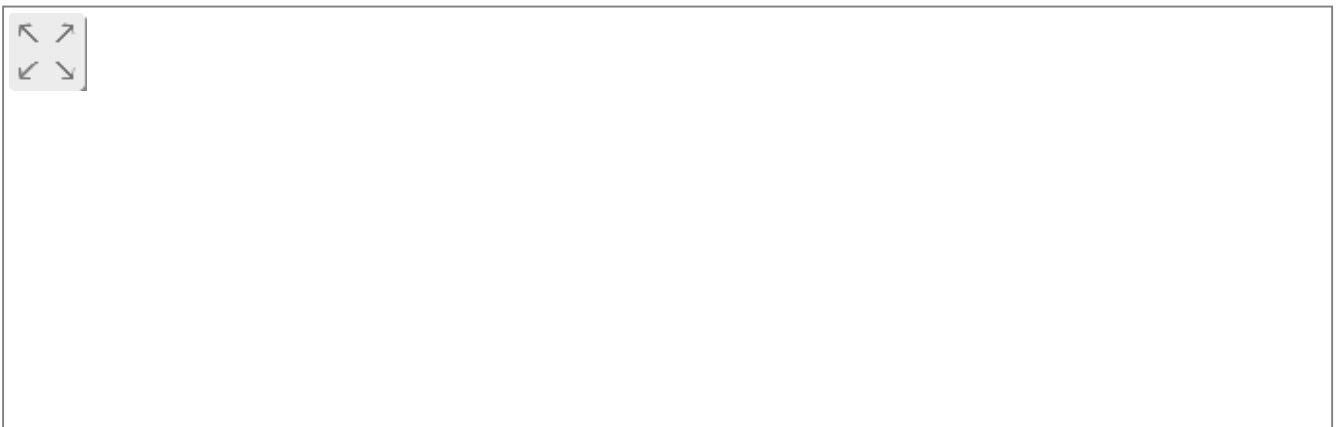
Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

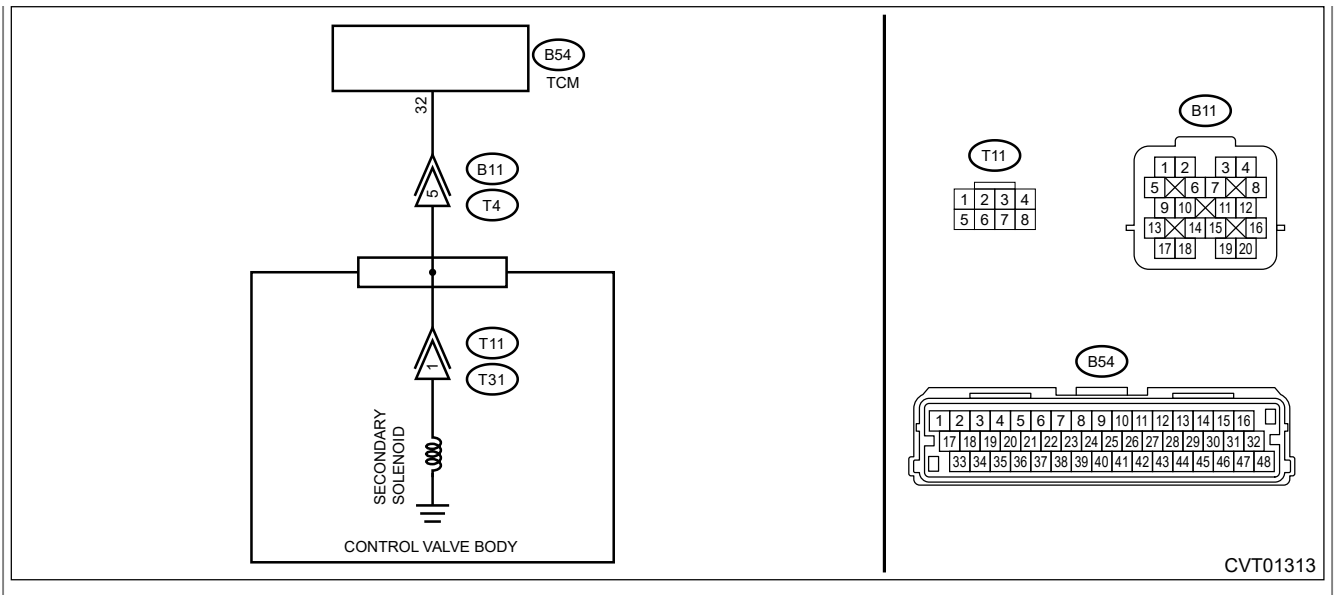
Wiring diagram:

- Non-turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK INPUT SIGNAL FOR TCM.

1. After driving with warm up condition, park the vehicle while depressing the brake pedal at "N" range.
2. Using Subaru Select Monitor, read the data of [Secondary Set Current] and [Secondary Actual Current].

Do [Secondary Set Current] and [Secondary Actual Current] almost match?

Yes

Check for poor contact of connector.

No

[Go to 2.](#)

2. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Measure the resistance between TCM connector and transmission connectors.

Connector & terminal

Non-turbo model

(B54) No. 32 — (B11) No. 6:

Turbo model

(B54) No. 32 — (B11) No. 5:

Is the resistance less than 1 Ω ?

Yes

[Go to 3.](#)

No

Repair the open circuit of harness.

3. CHECK HARNESS.


1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connector and chassis ground.

Connector & terminal

(B54) No. 32 (+) — Chassis ground (-):

Is the voltage approx. 0 V?

Yes

 [Go to 4.](#)

No

Repair the short circuit of harness.

4. CHECK SECONDARY SOLENOID.

Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model



(T4) No. 6 — Transmission body:

Turbo model

(T4) No. 5 — Transmission body:

Is the resistance approximately 5 — 7 Ω ? (when cold)

Yes

Check for poor contact of connector, and if no fault is found, replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

 [Go to 5.](#)

5. CHECK HARNESS INSIDE TRANSMISSION.

Caution:

Start work after ATF cools down.

1. Remove the following parts.
 - Transmission valve cover (non-turbo model)
 - Transmission oil pan (turbo model)
2. Check for the harness pinch, damage.

Is there any fault in the harness?

Yes

Replace the transmission harness.

No

 [Go to 6.](#)

6. CHECK HARNESS INSIDE TRANSMISSION.

1. Disconnect the control valve body connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between transmission connector and transmission body.

Connector & terminal

Non-turbo model



(T4) No. 6 (+) — Transmission body (-):

Turbo model

(T4) No. 5 (+) — Transmission body (-):

Is the voltage approx. 0 V?

Yes

Replace the control valve body.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

No

Replace the transmission harness.

1. OUTLINE OF DIAGNOSIS

- Detect short circuit to power supply or open circuit of the transmission line pressure solenoid drive circuit.
- Judge as NG if the transmission line pressure solenoid drive current is lower than the predetermined value.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	$\geq 9 \text{ V}$
Commanded line pressure control solenoid valve current	$\geq 0.2 \text{ A}$

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured line pressure control solenoid valve current	$< 0.1 \text{ A}$

Time needed for diagnosis: 0.5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0965 PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Immediately at fault recognition

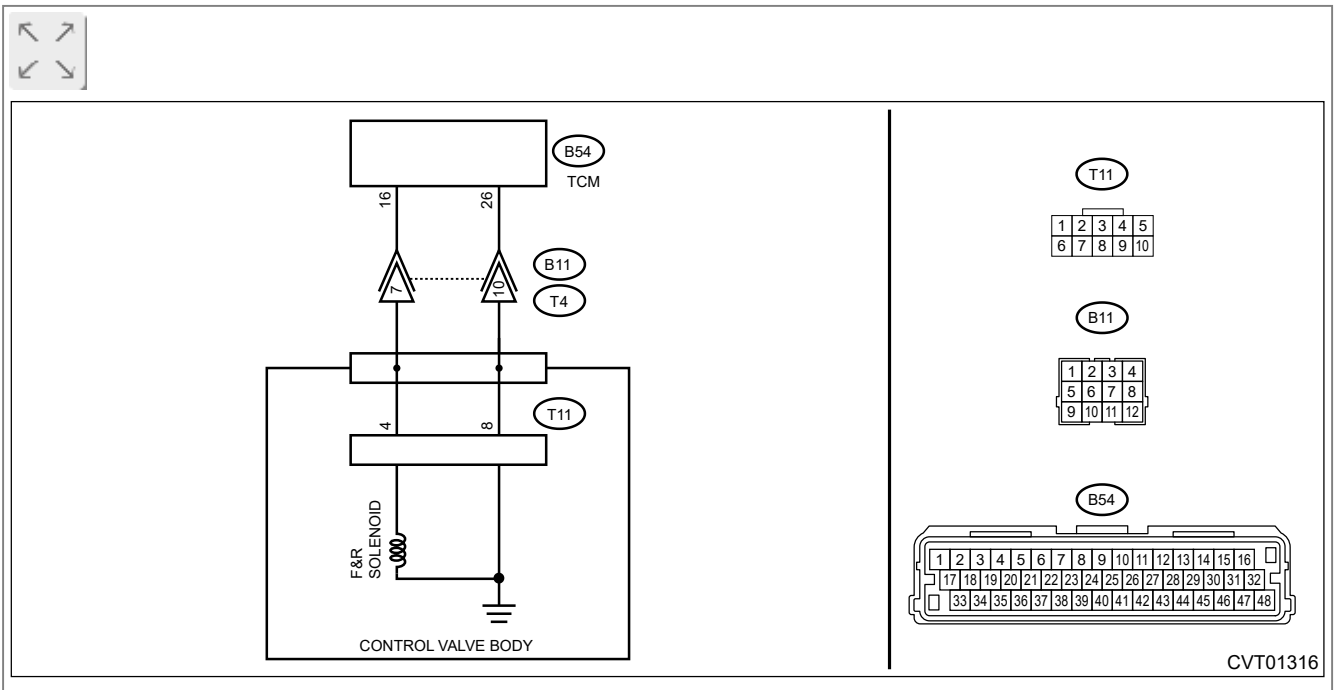
Trouble symptom:

- Engine speed increases abruptly, and can not accelerate.
- Excessive slippage is felt.

Wiring diagram:

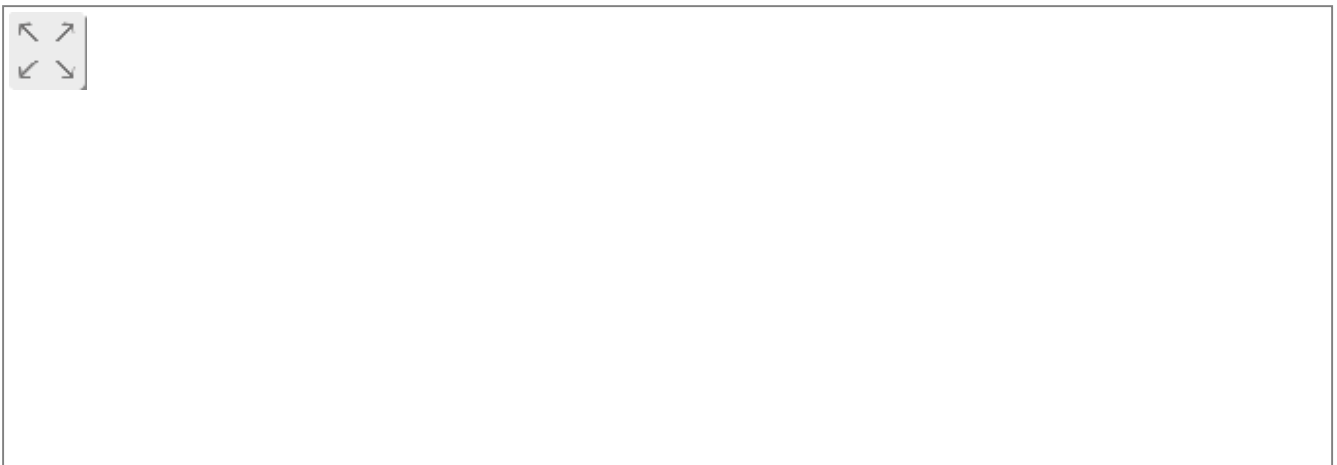
- Non-turbo model

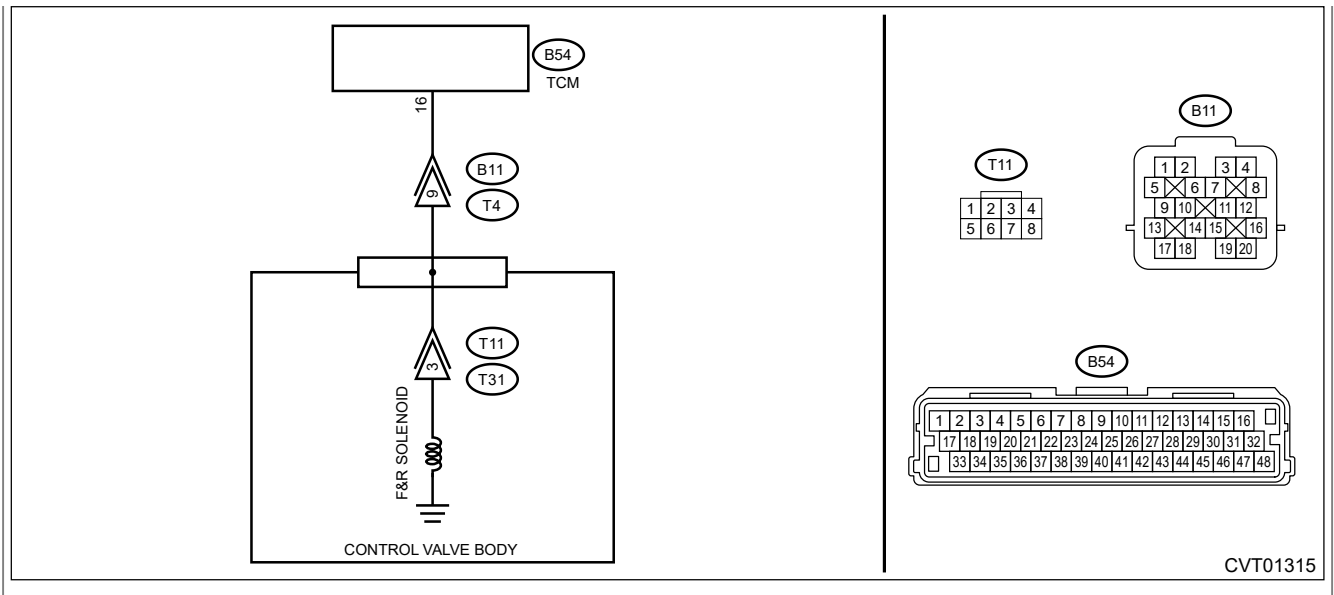
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model

CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK DTC.

Read the DTC using Subaru Select Monitor.

Besides DTC P0965, is any of the DTCs P0717, P0720, P0966, P0967, P2747 and P2751 displayed?

Yes

Perform the diagnosis according to DTCs other than P0965.

No

[Go to 2.](#)

2. CHECK F&R SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.

2. Using the Subaru Select Monitor, perform forced operation of the F&R solenoid. [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Active Test.](#)

Is 300 → 500 → 700 mA indicated at forced operation, and does [Actual Forward & Reverse Linear Solenoid Current] follow [Commanded Forward & Reverse Linear Solenoid Current]?

Yes

[Go to 3.](#)

No

[Go to 4.](#)

3. CHECK FOR POOR CONTACT.



Check for poor contact of harness and connector between TCM and F&R solenoid.

Is there poor contact?

Yes

Repair the poor contact of harness and connector.

No

Recheck the poor contact of harness and connector. Replace the TCM if no fault is found.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

4. CHECK F&R SOLENOID.



1. Turn the ignition switch to OFF.
2. Disconnect the transmission connector.
3. Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model



(T4) No. 7 — Transmission body:

Turbo model

(T4) No. 9 — Transmission body:

Is the resistance approximately 4 — 6 Ω ? (when cold)

Yes

Replace the control valve body.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

No

Repair or replace the harness.

1. OUTLINE OF DIAGNOSIS

Diagnosis 1

- Detect the malfunction of transmission forward/reverse clutch pressure solenoid drive circuit characteristics.
- Judge as NG when the deviation between set current and actual current of the transmission forward/reverse clutch pressure solenoid drive circuit becomes equal to or larger than the predetermined value.

Diagnosis 2

- Detect the malfunction of transmission forward/reverse clutch pressure solenoid drive circuit characteristics.
- Judge as NG when the transmission forward/reverse clutch pressure solenoid drive current is within the predetermined value.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Diagnosis 1	
12 V battery system voltage	$\geq 9 \text{ V}$
Diagnosis 2	
12 V battery system voltage	$\geq 9 \text{ V}$

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Diagnosis 1	
Target forward & reverse clutch pressure control solenoid current – Measured forward & reverse clutch pressure control solenoid current	$> 0.2 \text{ A}$
Diagnosis 2	
Measured forward & reverse clutch pressure control solenoid current	$> 1.08 \text{ A}$ and $\leq 1.6 \text{ A}$

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0966 PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition


Trouble symptom:

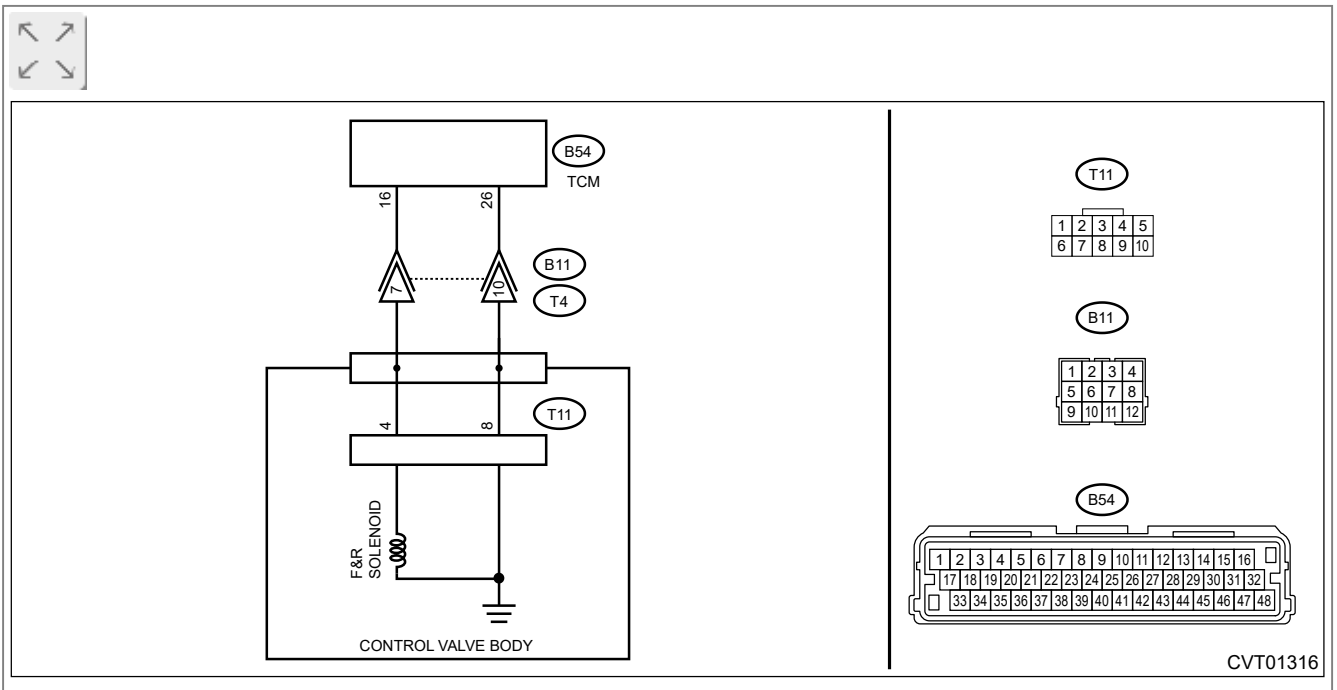
Excessive shift shock


Caution:

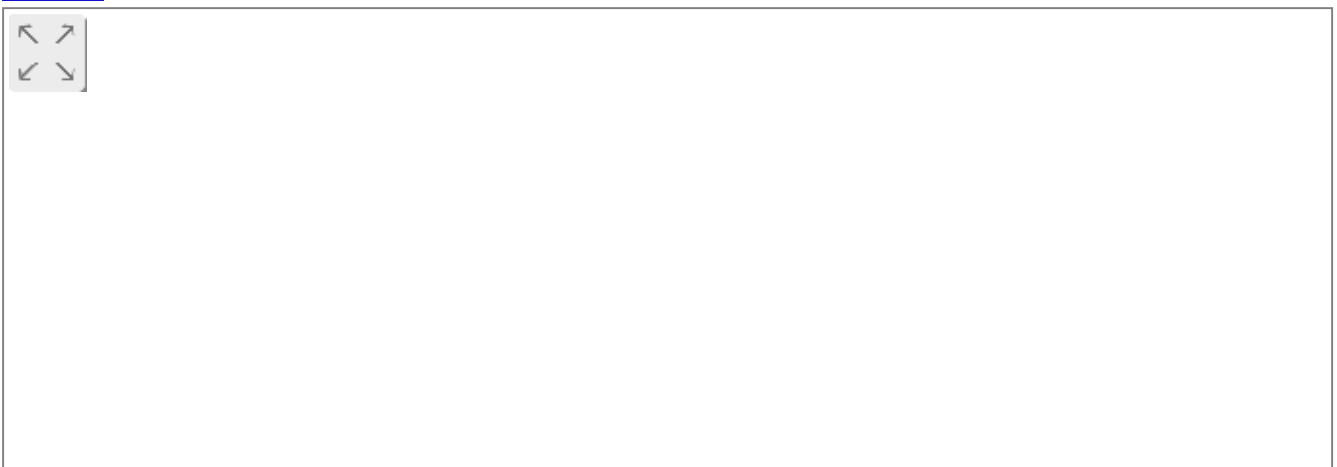
Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

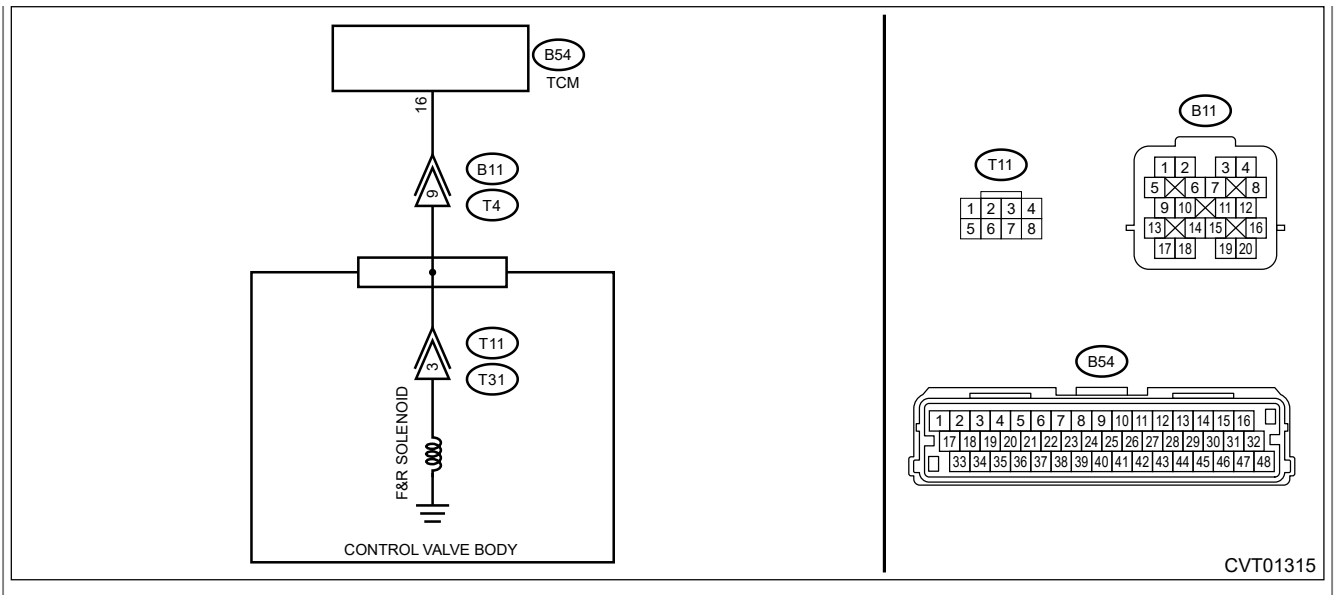
Wiring diagram:

- Non-turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





CVT01315

1. CHECK INPUT SIGNAL FOR TCM.

1. After driving with warm up condition, park the vehicle while depressing the brake pedal at "D" range.
2. Using Subaru Select Monitor, read the data of [Commanded Forward & Reverse Linear Solenoid Current] and [Actual Forward & Reverse Linear Solenoid Current].

Do [Commanded Forward & Reverse Linear Solenoid Current] and [Actual Forward & Reverse Linear Solenoid Current] almost match?

Yes

Check for poor contact of connector.

No

[Go to 2.](#)

2. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(B54) No. 16 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

[Go to 3.](#)

No

Repair the short circuit of harness.

3. CHECK F&R SOLENOID.



Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model



(T4) No. 7 — Transmission body:

Turbo model

(T4) No. 9 — Transmission body:

Is the resistance approximately 4 — 6 Ω ? (when cold)

Yes

Check for poor contact of connector, and if no fault is found, replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

 [Go to 4.](#)

4. CHECK HARNESS INSIDE TRANSMISSION.



Caution:

Start work after ATF cools down.

1. Remove the following parts.
 - Transmission valve cover (non-turbo model)
 - Transmission oil pan (turbo model)
2. Check for the harness pinch, damage.

Is there any fault in the harness?

Yes

Replace the transmission harness.

No

 [Go to 5.](#)

5. CHECK HARNESS INSIDE TRANSMISSION.



1. Disconnect the control valve body connector.
2. Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model



(T4) No. 7 — Transmission body:

Turbo model

(T4) No. 9 — Transmission body:

Is the resistance 1 M Ω or more?

Yes

Replace the control valve body.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

No

Replace the transmission harness.

1. OUTLINE OF DIAGNOSIS

- Detect the GND-output short in transmission forward/reverse clutch pressure solenoid circuit.
- Judge as NG when an abnormal signal is received from the solenoid driver IC of the transmission forward/reverse clutch pressure solenoid drive circuit.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 9 V

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal of malfunction from solenoid driver IC	ON
As defined by: Measured forward & reverse clutch pressure control solenoid current ≥ 1.6 A	

Time needed for diagnosis: 0.02 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0967 PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition


Trouble symptom:

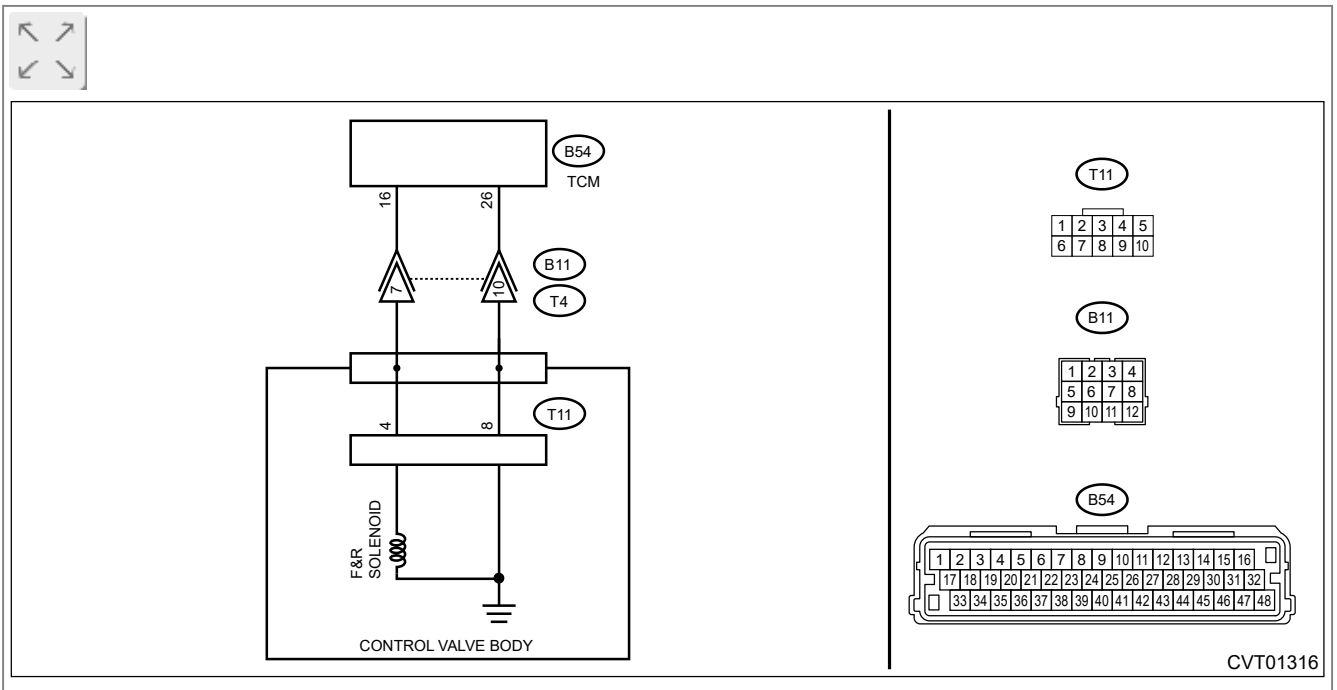
Engine speed increases abruptly, and can not start.


Caution:

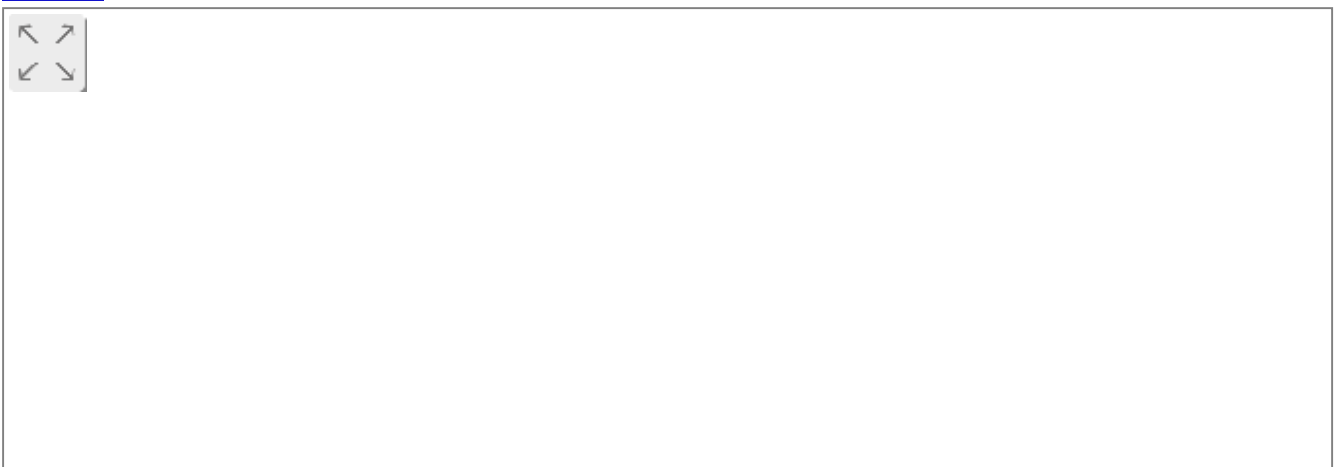
Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

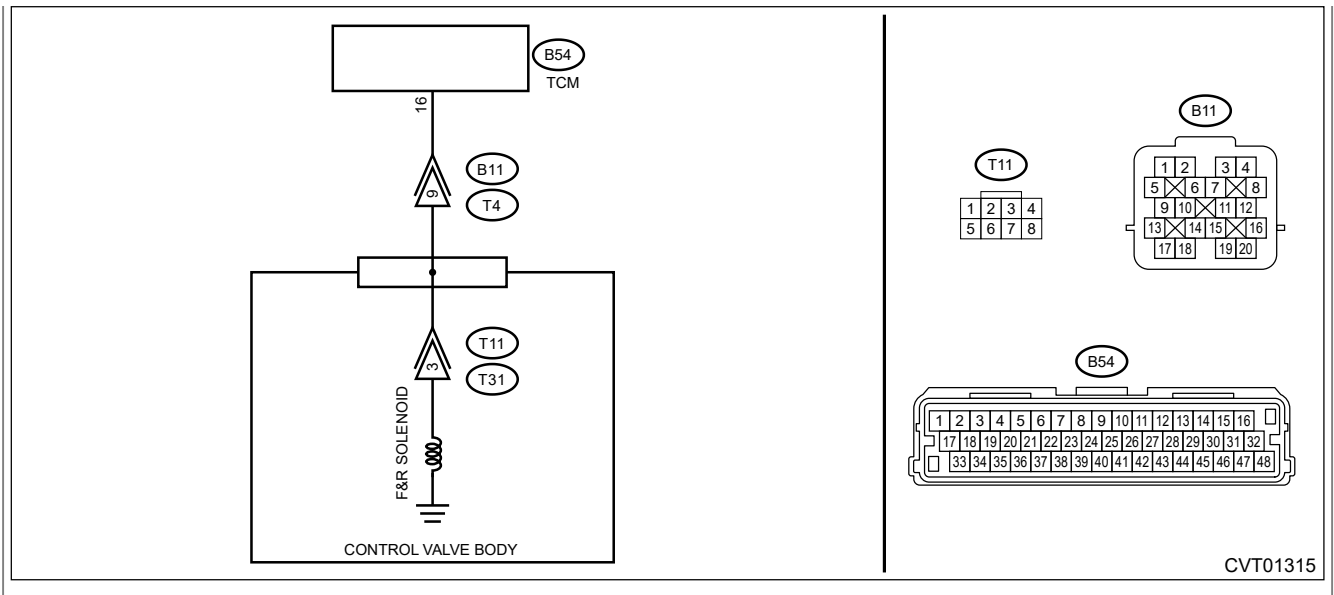
Wiring diagram:

- Non-turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK INPUT SIGNAL FOR TCM.

1. After driving with warm up condition, park the vehicle while depressing the brake pedal at "D" range.
2. Using Subaru Select Monitor, read the data of [Commanded Forward & Reverse Linear Solenoid Current] and [Actual Forward & Reverse Linear Solenoid Current].

Do [Commanded Forward & Reverse Linear Solenoid Current] and [Actual Forward & Reverse Linear Solenoid Current] almost match?

Yes

Check for poor contact of connector.

No

[Go to 2.](#)

2. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Measure the resistance between TCM connector and transmission connectors.

Connector & terminal

Non-turbo model

(B54) No. 16 — (B11) No. 7:


Turbo model

(B54) No. 16 — (B11) No. 9:

Is the resistance less than 1 Ω?



Yes

 [Go to 3.](#)

No

Repair the open circuit of harness.

3. CHECK HARNESS.

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connector and chassis ground.

Connector & terminal

(B54) No. 16 (+) — Chassis ground (–):

Is the voltage approx. 0 V?

Yes

 [Go to 4.](#)

No

Repair the short circuit of harness.

4. CHECK F&R SOLENOID.

Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model



(T4) No. 7 — Transmission body:

Turbo model

(T4) No. 9 — Transmission body:

Is the resistance approximately 4 — 6 Ω ? (when cold)

Yes

Check for poor contact of connector, and if no fault is found, replace the TCM. 
[Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

 [Go to 5.](#)

5. CHECK HARNESS INSIDE TRANSMISSION.

Caution:

Start work after ATF cools down.

1. Remove the following parts.
 - Transmission valve cover (non-turbo model)
 - Transmission oil pan (turbo model)

2. Check for the harness pinch, damage.

Is there any fault in the harness?

Yes

Replace the transmission harness.

No

 [Go to 6.](#)

6. CHECK HARNESS INSIDE TRANSMISSION.

1. Disconnect the control valve body connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between transmission connector and transmission body.

Connector & terminal

Non-turbo model



(T4) No. 7 (+) — Transmission body (-):

Turbo model

(T4) No. 9 (+) — Transmission body (-):

Is the voltage approx. 0 V?

Yes

Replace the control valve body.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

No

Replace the transmission harness.

1. OUTLINE OF DIAGNOSIS

- Detect open circuit or power supply-output short circuit in the transmission forward/reverse clutch pressure solenoid circuit.
- Judge as NG if the transmission forward/reverse clutch pressure solenoid drive current is lower than the predetermined value.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	$\geq 9 \text{ V}$
Target forward & reverse clutch pressure control solenoid current	$\geq 0.1 \text{ A}$

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
----------------------	-----------------

Signal of malfunction from solenoid driver IC	ON
As defined by: Measured forward & reverse clutch pressure control solenoid current < 5.9 mA	

Time needed for diagnosis: 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0970 PRESSURE CONTROL SOLENOID "C" CONTROL CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition


Trouble symptom:

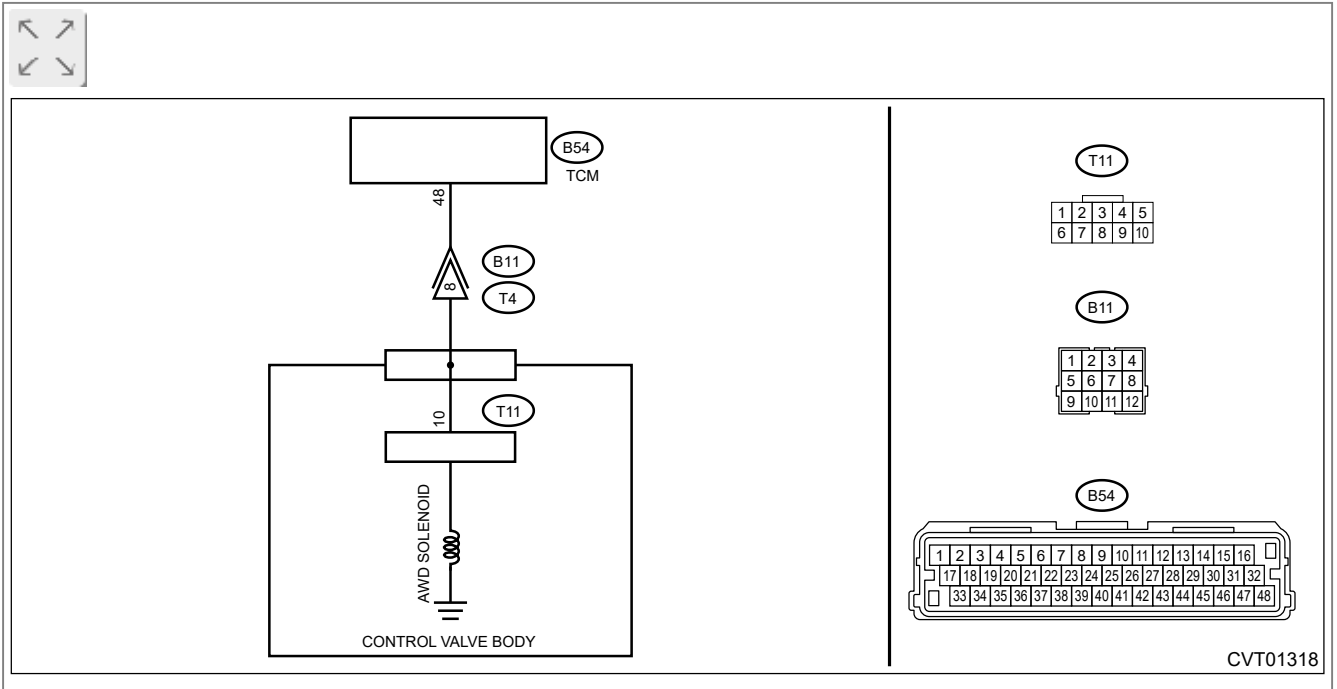
Drivability getting worse.


Caution:

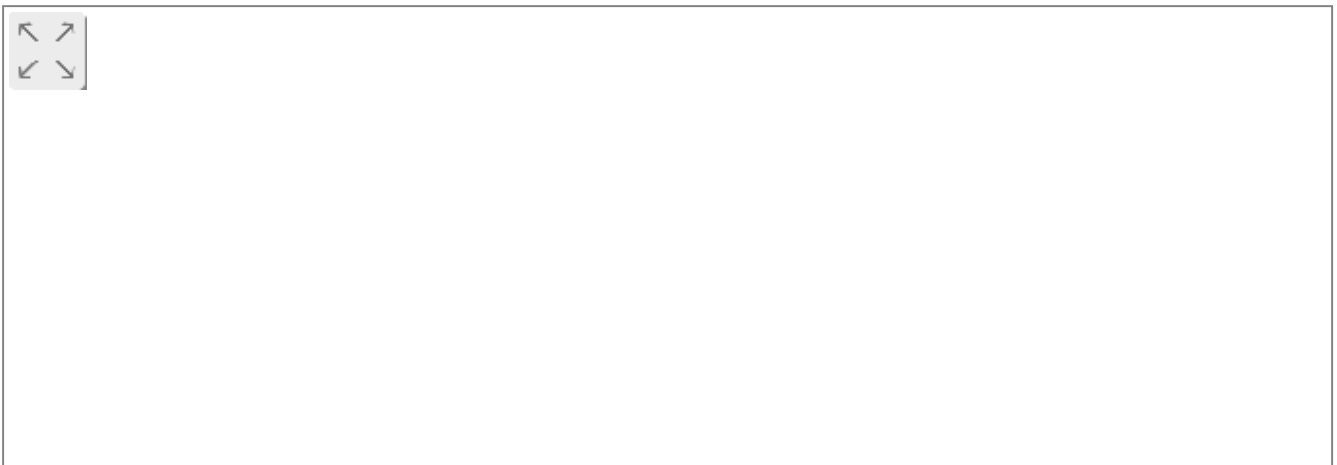
Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

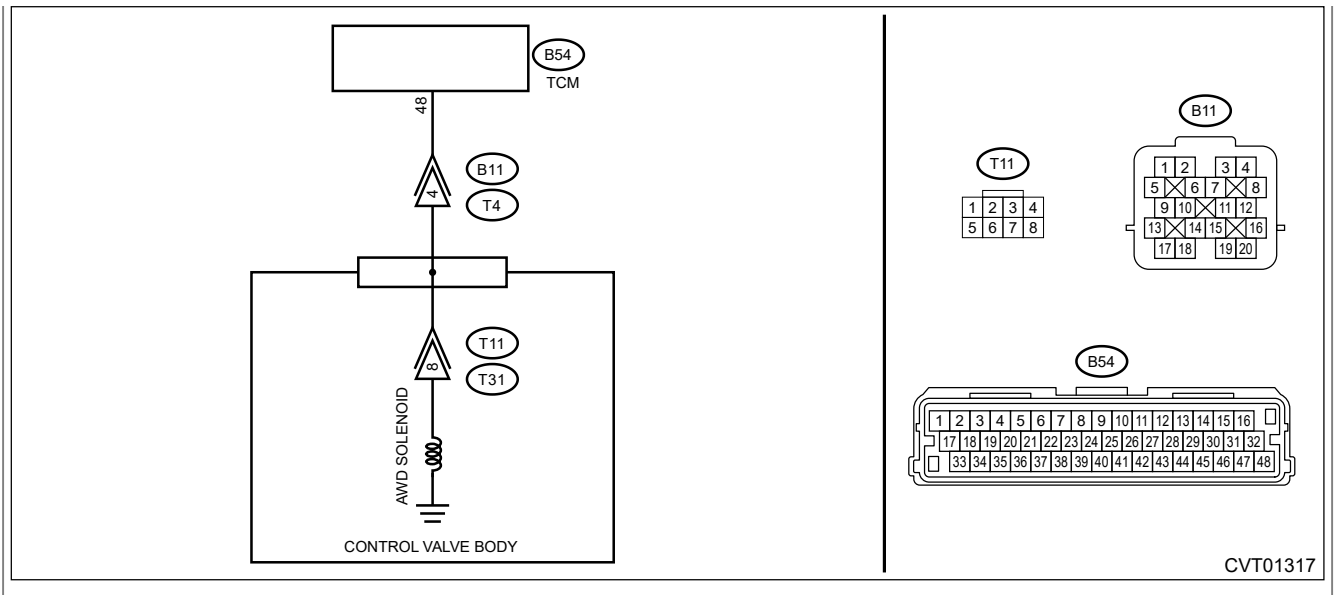
Wiring diagram:

- Non-turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(B54) No. 48 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

[Go to 2.](#)

No

Repair the short circuit of harness.

2. CHECK AWD SOLENOID.

Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model

(T4) No. 8 — Transmission body:


Turbo model

(T4) No. 4 — Transmission body:

Is the resistance approximately 2 — 4.5 Ω ? (when cold)

Yes

Check for poor contact of connector, and if no fault is found, replace the TCM. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control](#)

[Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

 [Go to 3.](#)

3. CHECK HARNESS INSIDE TRANSMISSION.

Caution:

Start work after ATF cools down.

1. Remove the following parts.
 - Transmission valve cover (non-turbo model)
 - Transmission oil pan (turbo model)
2. Check for the harness pinch, damage.

Is there any fault in the harness?

Yes

Replace the transmission harness.

No

 [Go to 4.](#)

4. CHECK HARNESS INSIDE TRANSMISSION.

1. Disconnect the control valve body connector.
2. Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model



(T4) No. 8 — Transmission body:

Turbo model

(T4) No. 4 — Transmission body:

Is the resistance 1 MΩ or more?

Yes

Replace the control valve body.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

No

Replace the transmission harness.

1. OUTLINE OF DIAGNOSIS

- Detect the GND-output short in transfer solenoid circuit.
- Judge as NG if a ground short circuit is detected more than 10 times via the detection circuit for the transfer solenoid drive circuit.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Target duty cycle	0%

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Malfunction signal from solenoid driver IC	≥ 10 count

Time needed for diagnosis: Immediately

Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0971 PRESSURE CONTROL SOLENOID "C" CONTROL CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition


Trouble symptom:

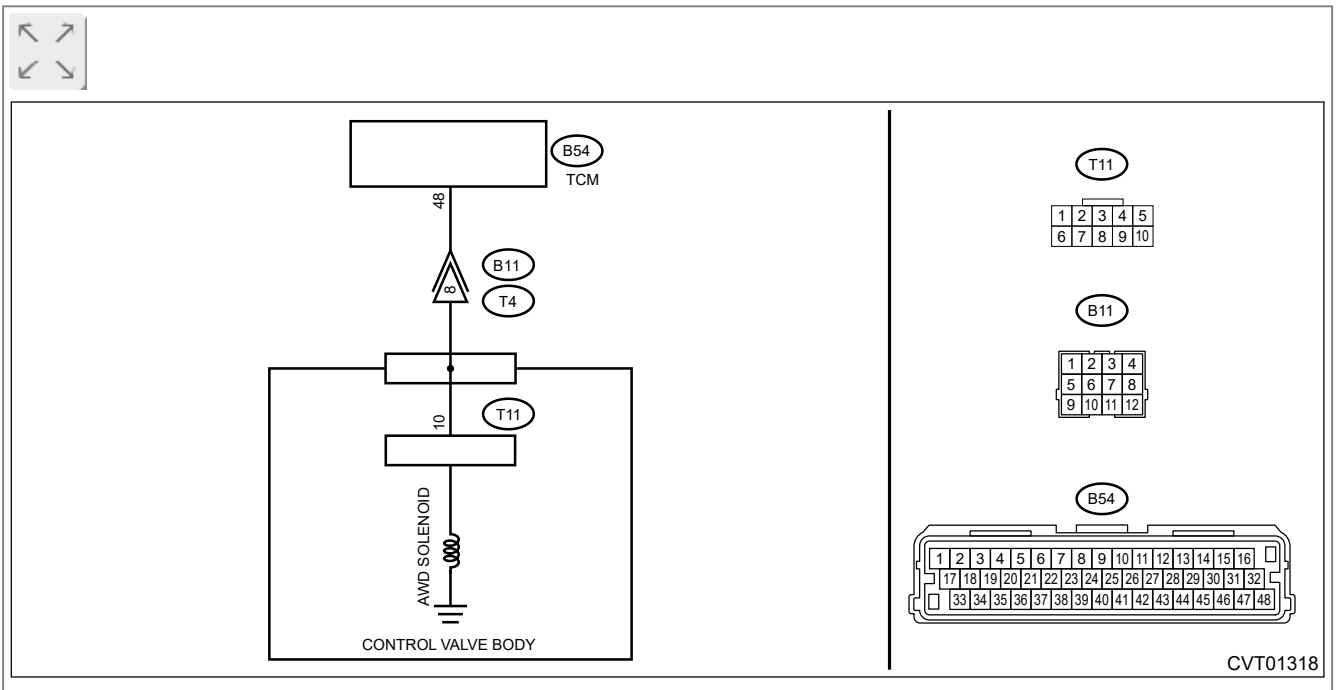
- Tight corner braking phenomenon occurs.
- Drivability getting worse.


Caution:

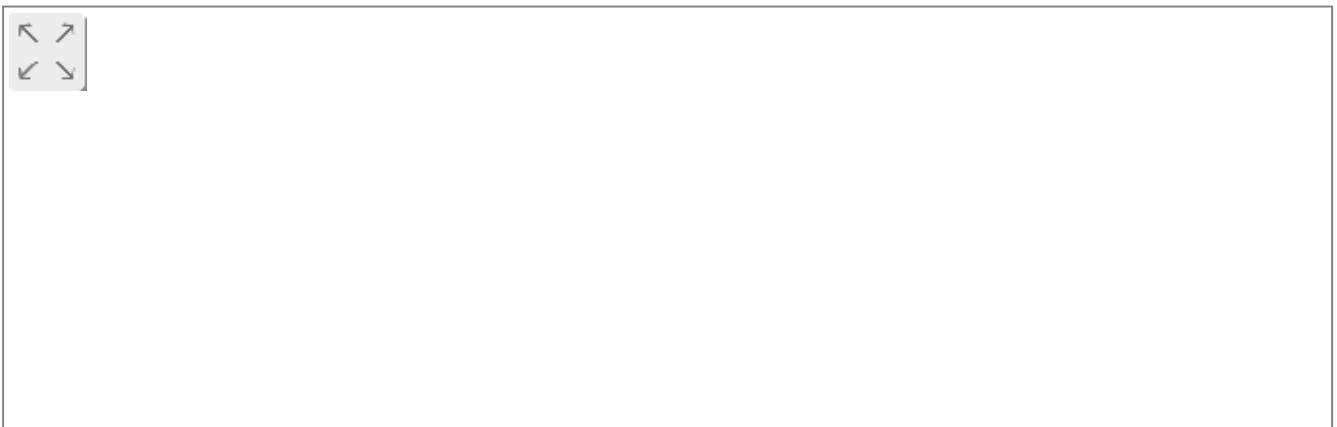
Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

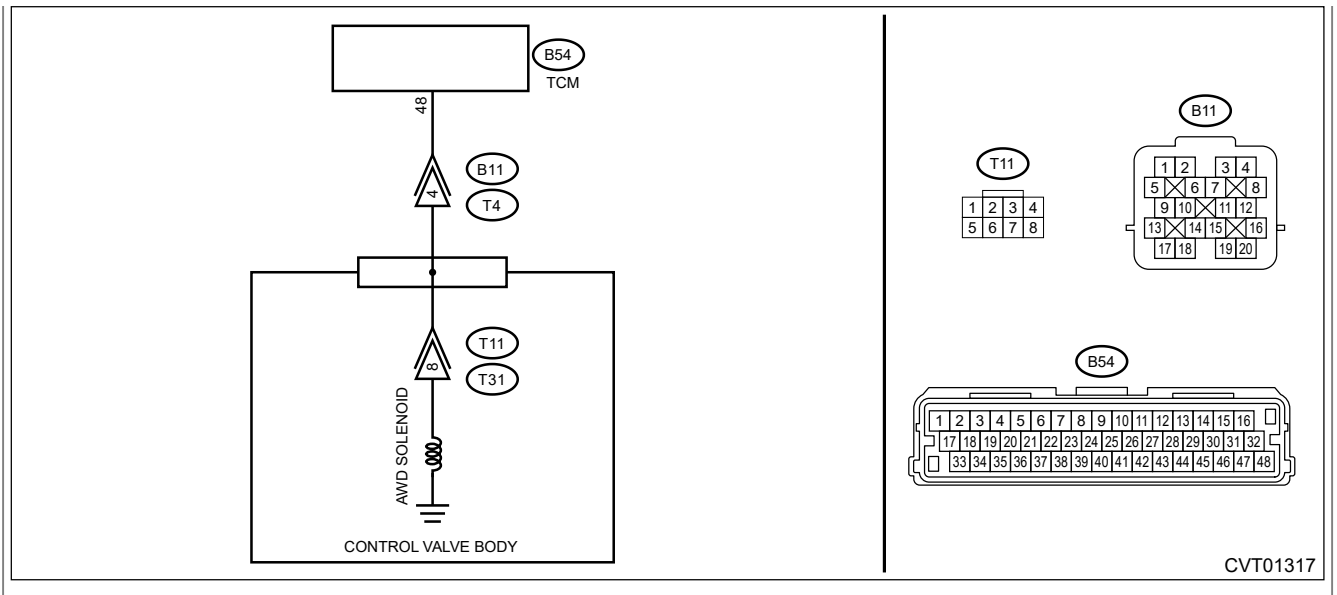
Wiring diagram:

- Non-turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Measure the resistance between TCM connector and transmission connectors.

Connector & terminal

Non-turbo model

(B54) No. 48 — (B11) No. 8:

Turbo model

(B54) No. 48 — (B11) No. 4:

Is the resistance less than 1 Ω ?

Yes

[Go to 2.](#)

No

Repair the open circuit of harness.

2. CHECK HARNESS.

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connector and chassis ground.

Connector & terminal

(B54) No. 48 (+) — Chassis ground (-):

Is the voltage approx. 0 V?

Yes

[Go to 3.](#)

No

Repair the short circuit of harness.

3. CHECK AWD SOLENOID.

Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model



(T4) No. 8 — Transmission body:

Turbo model


(T4) No. 4 — Transmission body:

Is the resistance approximately 2 — 4.5 Ω ? (when cold)

Yes

Check for poor contact of connector, and if no fault is found, replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

 [Go to 4.](#)

4. CHECK HARNESS INSIDE TRANSMISSION.

Caution:

Start work after ATF cools down.

1. Remove the following parts.
 - Transmission valve cover (non-turbo model)
 - Transmission oil pan (turbo model)
2. Check for the harness pinch, damage.

Is there any fault in the harness?

Yes

Replace the transmission harness.

No

 [Go to 5.](#)

5. CHECK HARNESS INSIDE TRANSMISSION.

1. Disconnect the control valve body connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between transmission connector and transmission body.

Connector & terminal

Non-turbo model



(T4) No. 8 (+) — Transmission body (—):

Turbo model

(T4) No. 4 (+) — Transmission body (—):

Is the voltage approx. 0 V?

Yes

Replace the control valve body.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

No

Replace the transmission harness.

1. OUTLINE OF DIAGNOSIS

- Detect open circuit or power supply-output short circuit in the transfer solenoid circuit.
- Judge as NG if an open circuit or a short circuit to ground is detected more than 10 times via the detection circuit in the transfer solenoid drive circuit.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
Target duty cycle	100%

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Malfunction signal from solenoid driver IC	≥ 10 count

Time needed for diagnosis: Immediately

Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0973 SHIFT SOLENOID "A" CONTROL CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition


Trouble symptom:

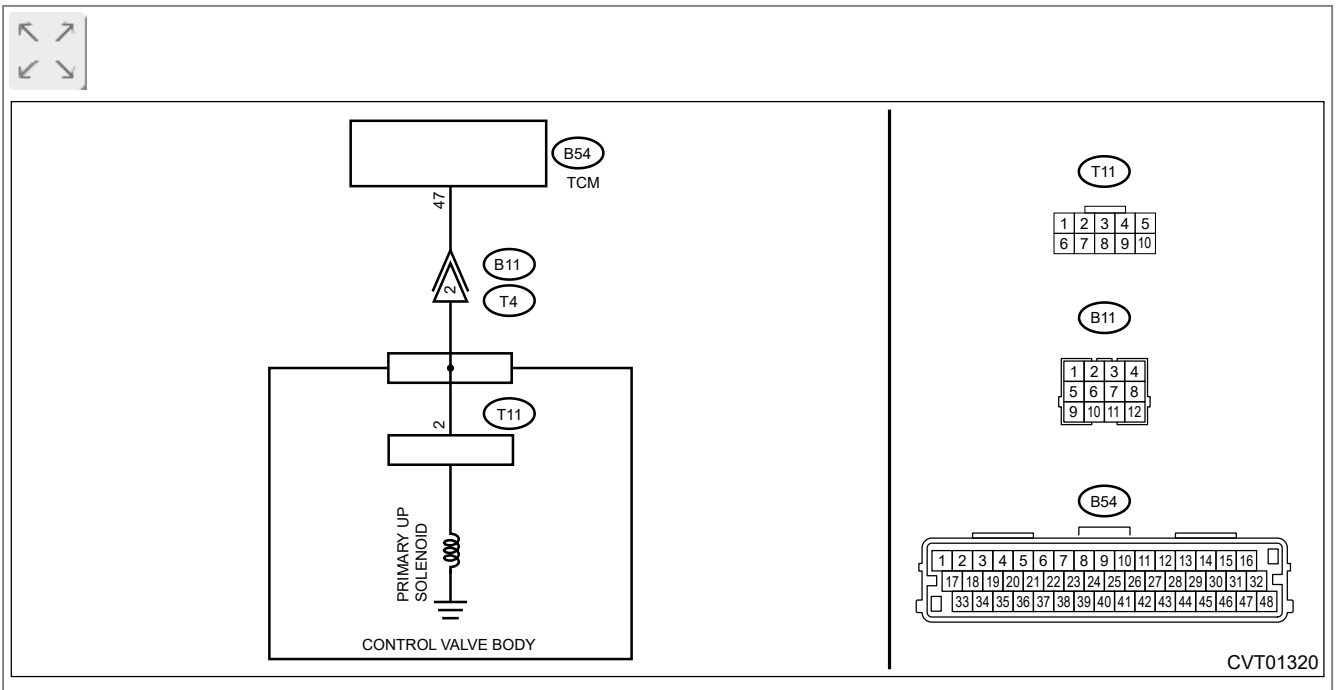
Gear is not changed. (No up-shift)


Caution:

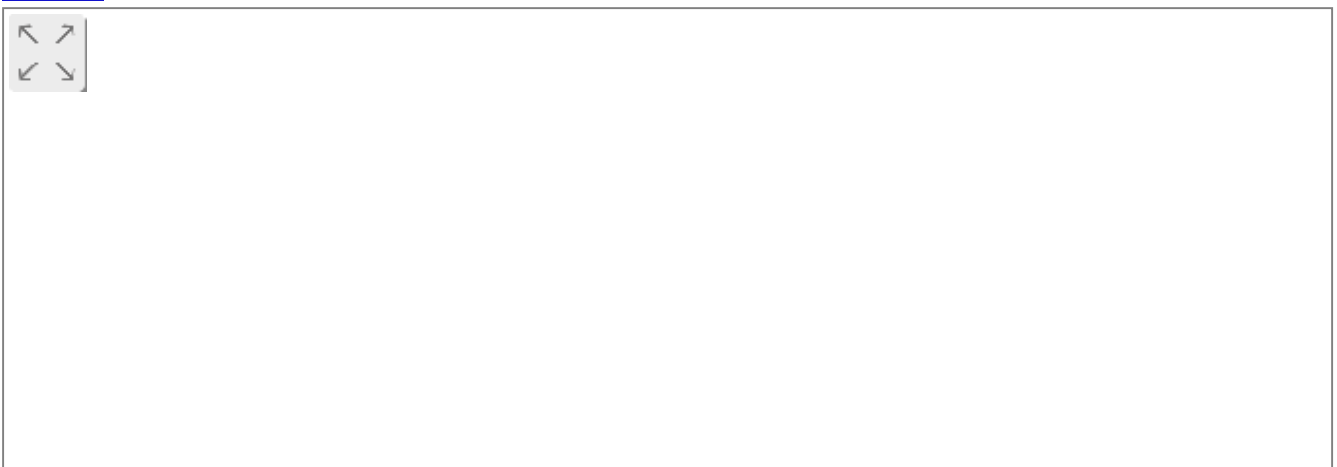
Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

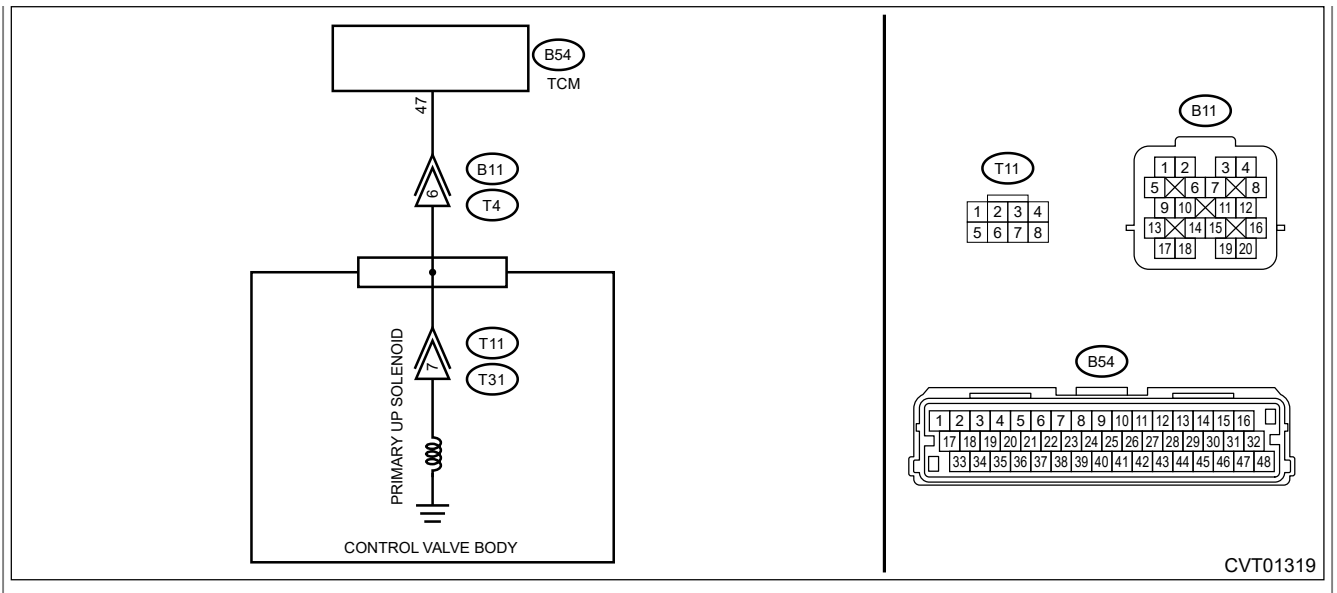
Wiring diagram:

- Non-turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





CVT01319

1. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(B54) No. 47 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

[Go to 2.](#)

No

Repair the short circuit of harness.

2. CHECK PRIMARY UP SOLENOID.

Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model

(T4) No. 2 — Transmission body:


Turbo model

(T4) No. 6 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω? (when cold)

Yes

Check for poor contact of connector, and if no fault is found, replace the TCM. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control](#)

[Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

 [Go to 3.](#)

3. CHECK HARNESS INSIDE TRANSMISSION.

Caution:

Start work after ATF cools down.

1. Remove the following parts.
 - Transmission valve cover (non-turbo model)
 - Transmission oil pan (turbo model)
2. Check for the harness pinch, damage.

Is there any fault in the harness?

Yes

Replace the transmission harness.

No

 [Go to 4.](#)

4. CHECK HARNESS INSIDE TRANSMISSION.

1. Disconnect the control valve body connector.
2. Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model



(T4) No. 2 — Transmission body:

Turbo model

(T4) No. 6 — Transmission body:

Is the resistance 1 MΩ or more?

Yes

Replace the control valve body.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

No

Replace the transmission harness.

1. OUTLINE OF DIAGNOSIS

- Detect the ground short of the shift-up fluid pressure control solenoid drive circuit.
- Judge as NG when an abnormal signal is received from the solenoid driver IC of the shift-up fluid pressure control solenoid drive circuit.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	$\geq 9 \text{ V}$
Commanded duty of shift up pressure control solenoid	100%

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal of malfunction from solenoid driver IC	ON
As defined by: Measured shift up pressure control solenoid voltage $\leq 0.8 \text{ V}$	

Time needed for diagnosis: 0.2 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0974 SHIFT SOLENOID "A" CONTROL CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition


Trouble symptom:

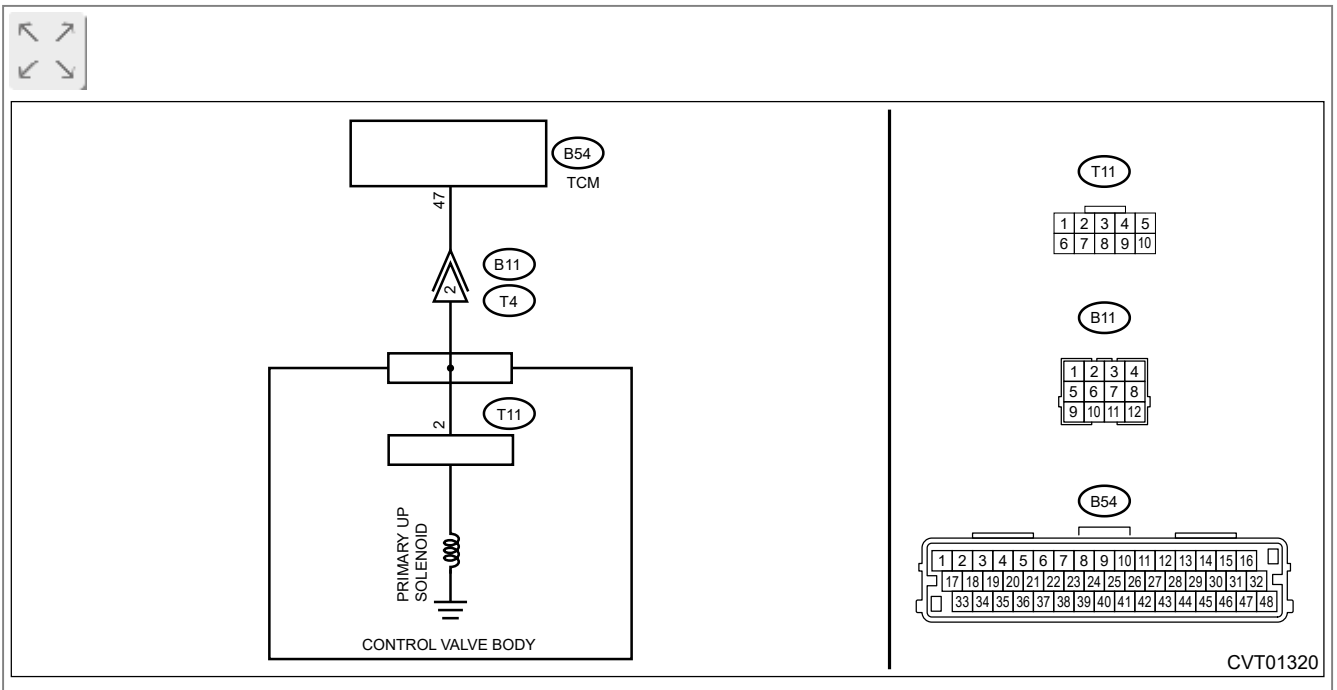
Gear is not changed. (No up-shift)


Caution:

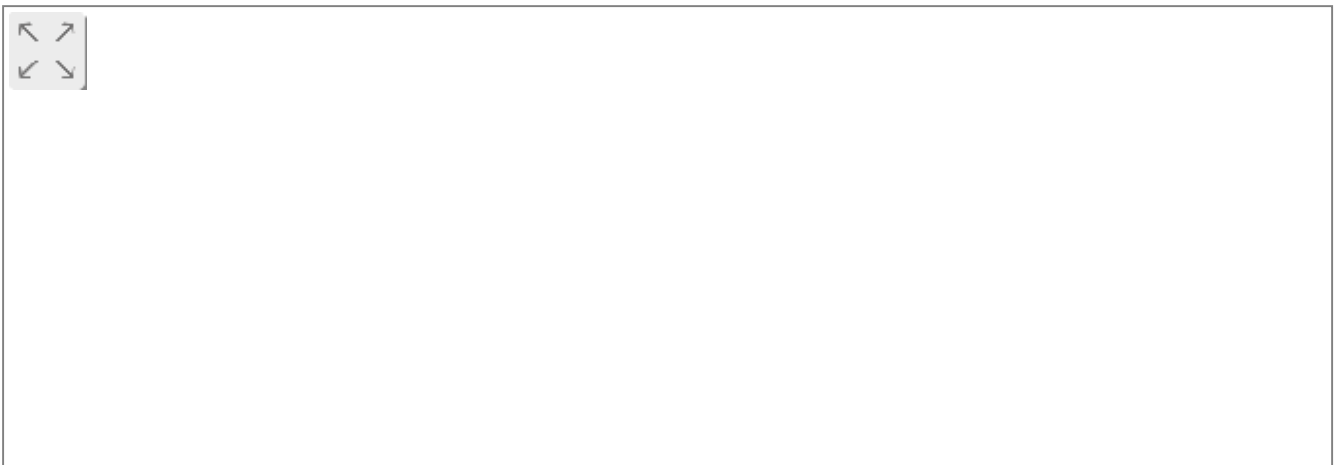
Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

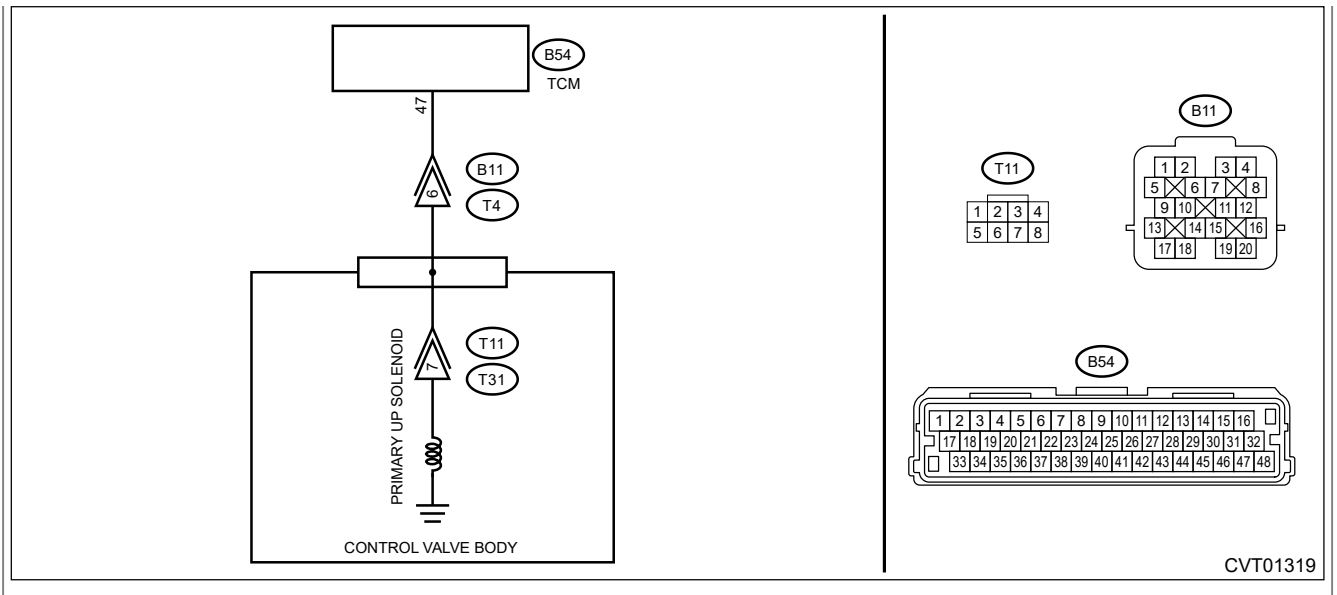
Wiring diagram:

- Non-turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Measure the resistance between TCM connector and transmission connectors.

Connector & terminal

Non-turbo model

(B54) No. 47 — (B11) No. 2:

Turbo model

(B54) No. 47 — (B11) No. 6:

Is the resistance less than 1 Ω ?

Yes

[Go to 2.](#)

No

Repair the open circuit of harness.

2. CHECK HARNESS.

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connector and chassis ground.

Connector & terminal

(B54) No. 47 (+) — Chassis ground (-):

Is the voltage approx. 0 V?

Yes

[Go to 3.](#)

No

Repair the short circuit of harness.

3. CHECK PRIMARY UP SOLENOID.

Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model



(T4) No. 2 — Transmission body:

Turbo model


(T4) No. 6 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω ? (when cold)

Yes

Check for poor contact of connector, and if no fault is found, replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

 [Go to 4.](#)

4. CHECK HARNESS INSIDE TRANSMISSION.

Caution:

Start work after ATF cools down.

1. Remove the following parts.
 - Transmission valve cover (non-turbo model)
 - Transmission oil pan (turbo model)
2. Check for the harness pinch, damage.

Is there any fault in the harness?

Yes

Replace the transmission harness.

No

 [Go to 5.](#)

5. CHECK HARNESS INSIDE TRANSMISSION.

1. Disconnect the control valve body connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between transmission connector and transmission body.

Connector & terminal

Non-turbo model



(T4) No. 2 (+) — Transmission body (–):

Turbo model

(T4) No. 6 (+) — Transmission body (–):

Is the voltage approx. 0 V?

Yes

Replace the control valve body.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

No

Replace the transmission harness.

1. OUTLINE OF DIAGNOSIS

- Detect short circuit to power supply or open circuit of the shift-up fluid pressure control solenoid drive circuit.
- Judge as NG when an abnormal signal is received from the solenoid driver IC of the shift-up fluid pressure control solenoid drive circuit.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	$\geq 9 \text{ V}$
Commanded duty of shift up pressure control solenoid	0%

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal of malfunction from solenoid driver IC	ON
As defined by: Measured shift up pressure control solenoid voltage $\geq 2.5 \text{ V}$	

Time needed for diagnosis: 0.2 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0976 SHIFT SOLENOID "B" CONTROL CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition


Trouble symptom:

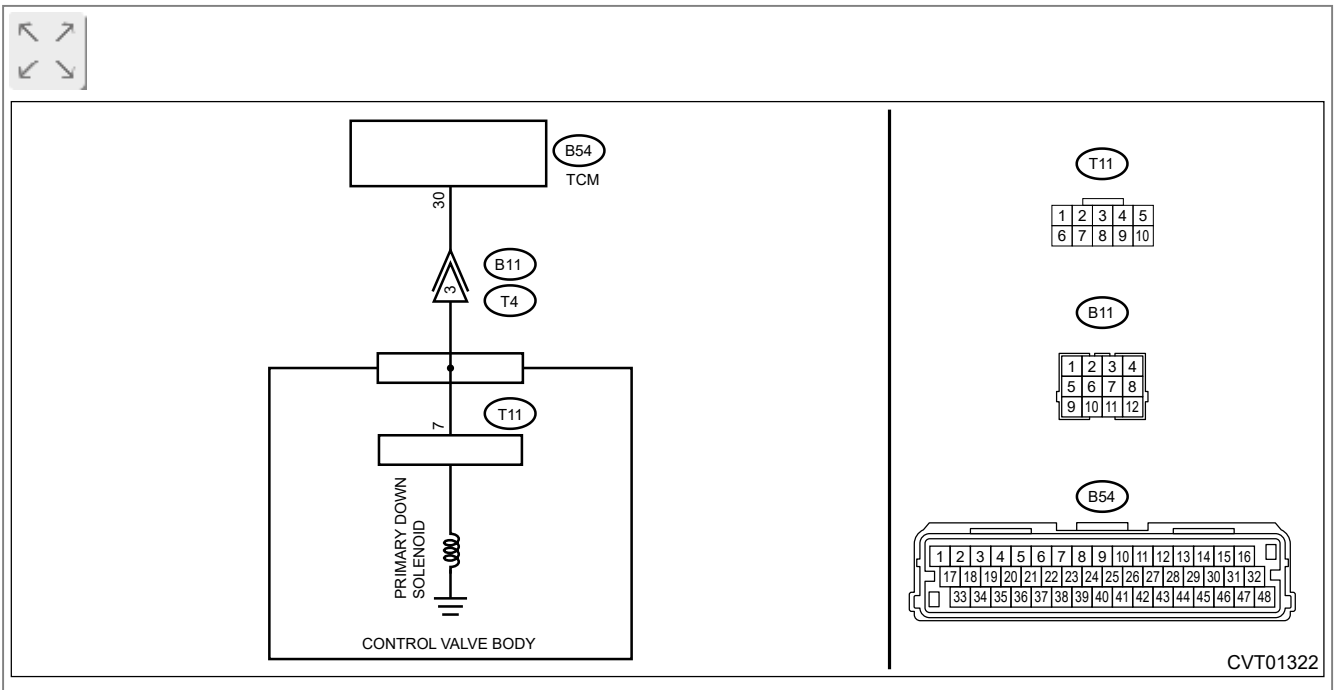
Gear is not changed. (No down-shift)


Caution:

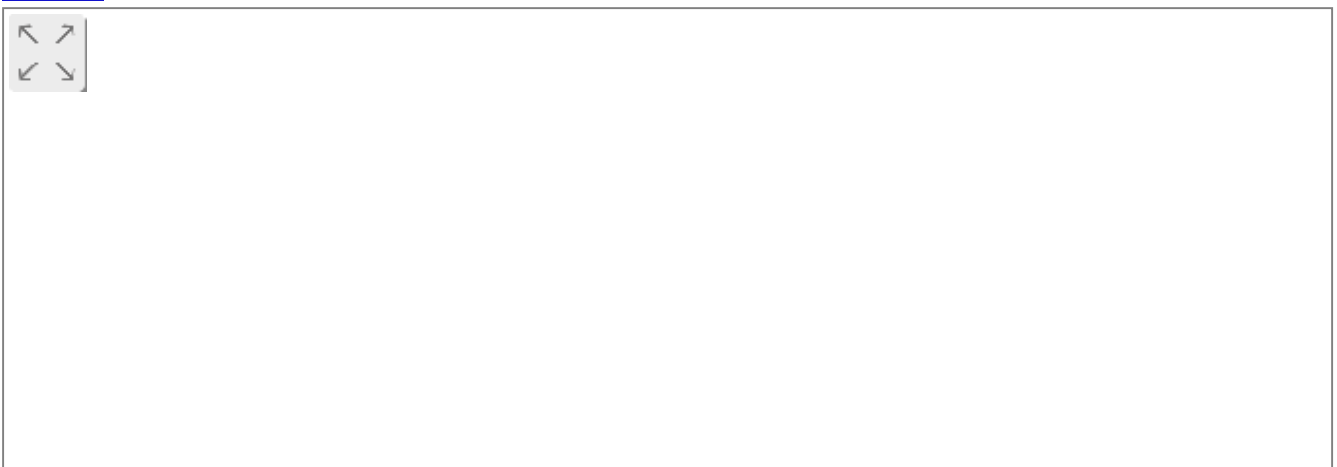
Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

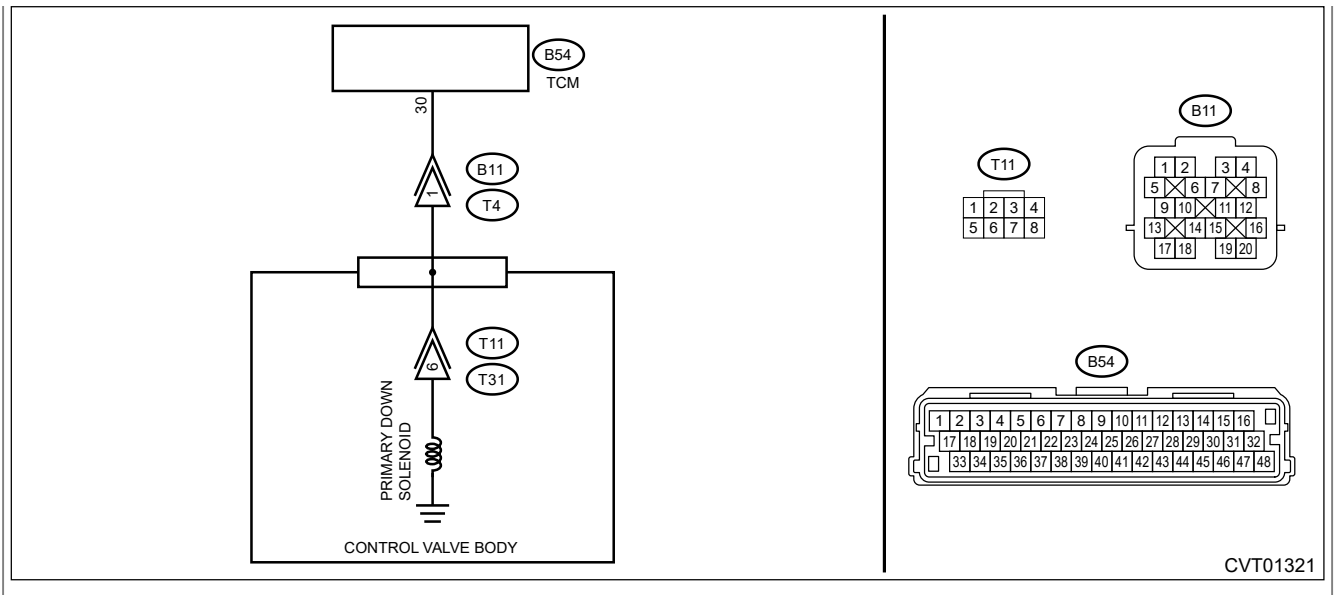
Wiring diagram:

- Non-turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(B54) No. 30 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

[Go to 2.](#)

No

Repair the short circuit of harness.

2. CHECK PRIMARY DOWN SOLENOID.

Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model

(T4) No. 3 — Transmission body:


Turbo model

(T4) No. 1 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω? (when cold)

Yes

Check for poor contact of connector, and if no fault is found, replace the TCM. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control](#)

[Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

 [Go to 3.](#)

3. CHECK HARNESS INSIDE TRANSMISSION.

Caution:

Start work after ATF cools down.

1. Remove the following parts.
 - Transmission valve cover (non-turbo model)
 - Transmission oil pan (turbo model)
2. Check for the harness pinch, damage.

Is there any fault in the harness?

Yes

Replace the transmission harness.

No

 [Go to 4.](#)

4. CHECK HARNESS INSIDE TRANSMISSION.

1. Disconnect the control valve body connector.
2. Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model



(T4) No. 3 — Transmission body:

Turbo model

(T4) No. 1 — Transmission body:

Is the resistance 1 MΩ or more?

Yes

Replace the control valve body.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

No

Replace the transmission harness.

1. OUTLINE OF DIAGNOSIS

- Detect the ground short of the shift-down fluid pressure control solenoid drive circuit.
- Judge as NG when an abnormal signal is received from the solenoid driver IC of the shift-down fluid pressure control solenoid drive circuit.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	$\geq 9 \text{ V}$
Commanded duty of shift down pressure control solenoid	100%

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal of malfunction from solenoid driver IC	ON
As defined by: Measured shift down pressure control solenoid voltage $\leq 0.8 \text{ V}$	

Time needed for diagnosis: 0.2 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0977 SHIFT SOLENOID "B" CONTROL CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition


Trouble symptom:

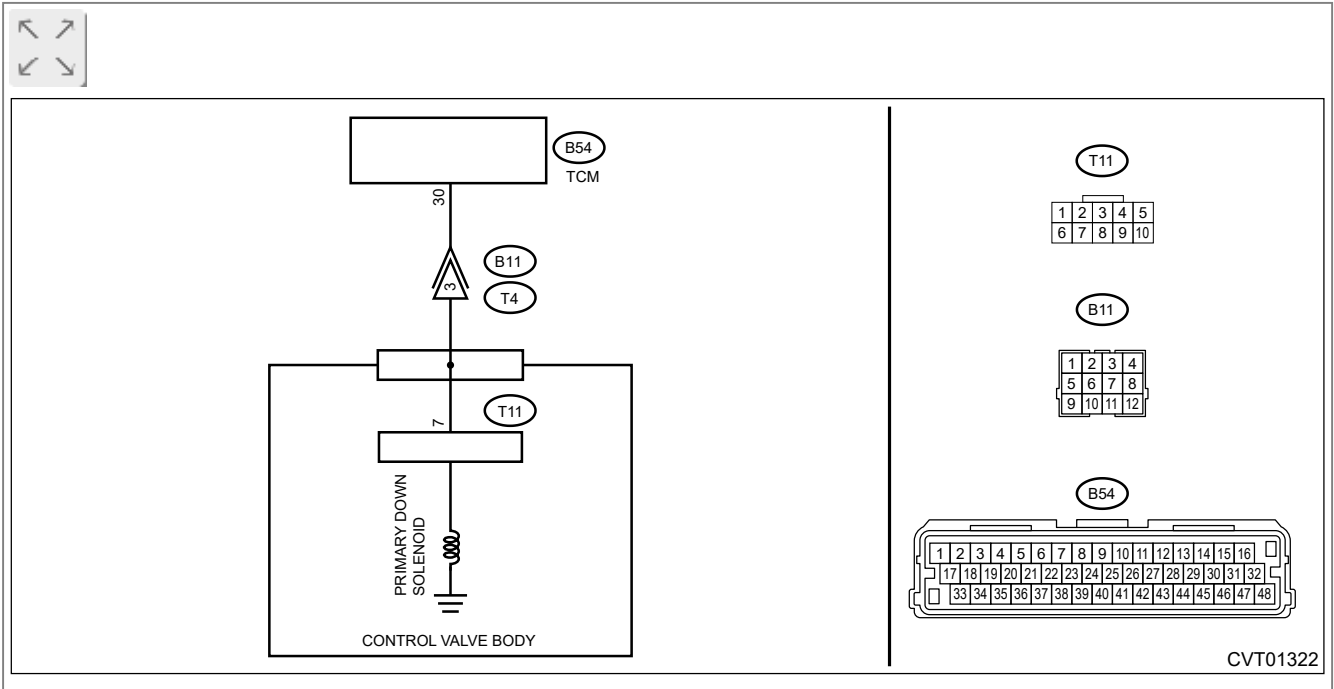
Gear is not changed. (No down-shift)


Caution:

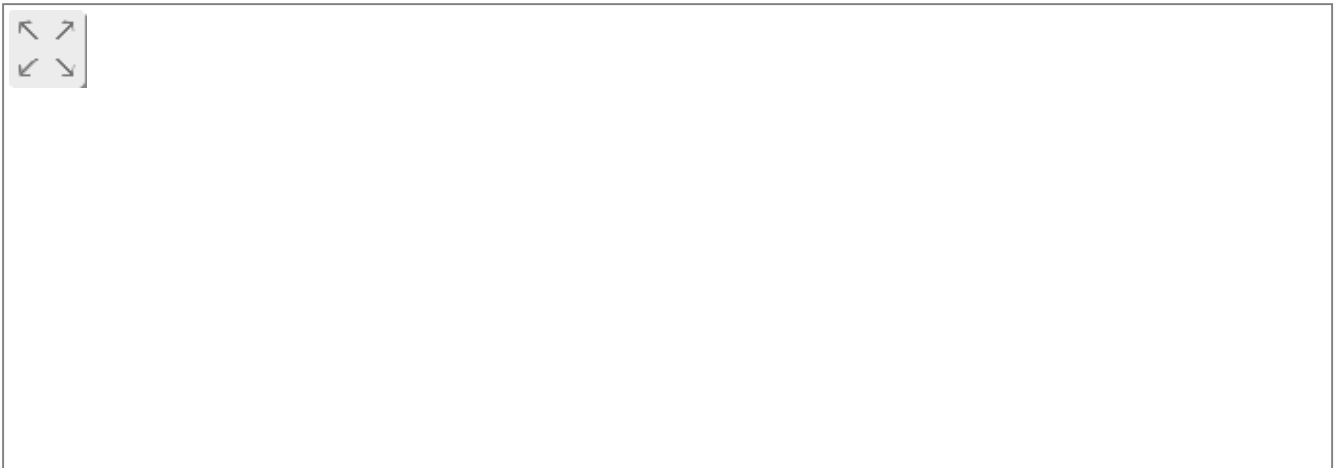
Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

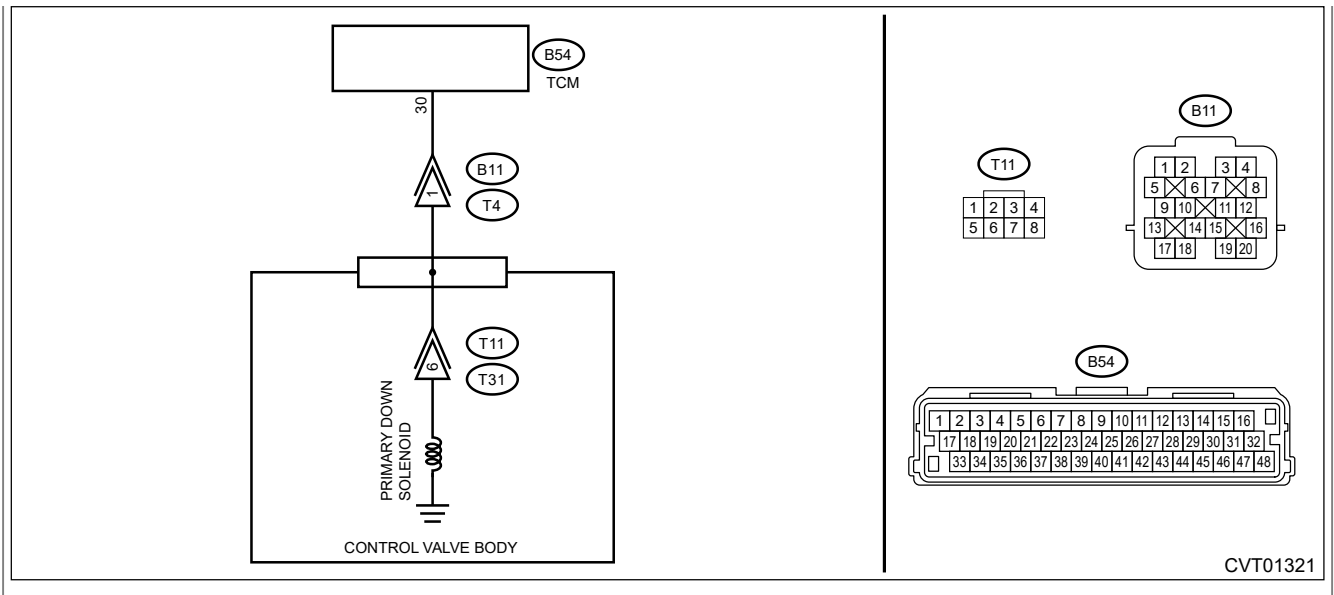
Wiring diagram:

- Non-turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





CVT01321

1. CHECK HARNESS.



1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Measure the resistance between TCM connector and transmission connectors.

Connector & terminal

Non-turbo model

(B54) No. 30 — (B11) No. 3:

Turbo model

(B54) No. 30 — (B11) No. 1:

Is the resistance less than 1 Ω ?

Yes

[Go to 2.](#)

No

Repair the open circuit of harness.

2. CHECK HARNESS.



1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connector and chassis ground.

Connector & terminal

(B54) No. 30 (+) — Chassis ground (-):

Is the voltage approx. 0 V?

Yes

[Go to 3.](#)

No

Repair the short circuit of harness.

3. CHECK PRIMARY DOWN SOLENOID.

Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model



(T4) No. 3 — Transmission body:

Turbo model


(T4) No. 1 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω ? (when cold)

Yes

Check for poor contact of connector, and if no fault is found, replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

 [Go to 4.](#)

4. CHECK HARNESS INSIDE TRANSMISSION.

Caution:

Start work after ATF cools down.

1. Remove the following parts.
 - Transmission valve cover (non-turbo model)
 - Transmission oil pan (turbo model)
2. Check for the harness pinch, damage.

Is there any fault in the harness?

Yes

Replace the transmission harness.

No

 [Go to 5.](#)

5. CHECK HARNESS INSIDE TRANSMISSION.

1. Disconnect the control valve body connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between transmission connector and transmission body.

Connector & terminal

Non-turbo model



(T4) No. 3 (+) — Transmission body (-):

Turbo model

(T4) No. 1 (+) — Transmission body (-):

Is the voltage approx. 0 V?

Yes

Replace the control valve body.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

No

Replace the transmission harness.

1. OUTLINE OF DIAGNOSIS

- Detect short circuit to power supply or open circuit of the shift-down fluid pressure control solenoid drive circuit.
- Judge as NG when an abnormal signal is received from the solenoid driver IC of the shift-down fluid pressure control solenoid drive circuit.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 9 V
Commanded duty of shift down pressure control solenoid	0%

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal of malfunction from solenoid driver IC	ON
As defined by: Measured shift down pressure control solenoid voltage ≥2.5 V	

Time needed for diagnosis: 0.2 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P160A RANDOM ACCESS MEMORY (RAM) ERROR


DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:



TCM RAM malfunction

1. CHECK DTC.

1. Perform the memory clear using the Subaru Select Monitor.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Clear memory.](#)
2. Read the DTC.

Is DTC P160A displayed?

Yes

Replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

Current condition is normal. Check for interference from noise, etc.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction in RAM area of the TCM.
- Judge as NG if an attempt to write to RAM area failed.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 9 V

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Writing-check (RAM) Note: This check is carried out about the RAM used except for CAN communication.	Error

Time needed for diagnosis: Immediately

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P170A L-RANGE SWITCH

Note:

Refer to "DTC P0951 MANUAL SWITCH" for diagnostic procedure.  Ref. to [TRANSMISSION \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0951 AUTO SHIFT MANUAL CONTROL CIRCUIT RANGE/PERFORMANCE.](#)

1. OUTLINE OF DIAGNOSIS

- Detect the GND-output short (ground-fault) in L range SW circuit.
- Judge as NG if the L range SW is ON in P, R or N range.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
D range SW	OFF

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
L range SW	ON

Time needed for diagnosis: 5 s

Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2530 IGNITION SWITCH RUN POSITION CIRCUIT

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

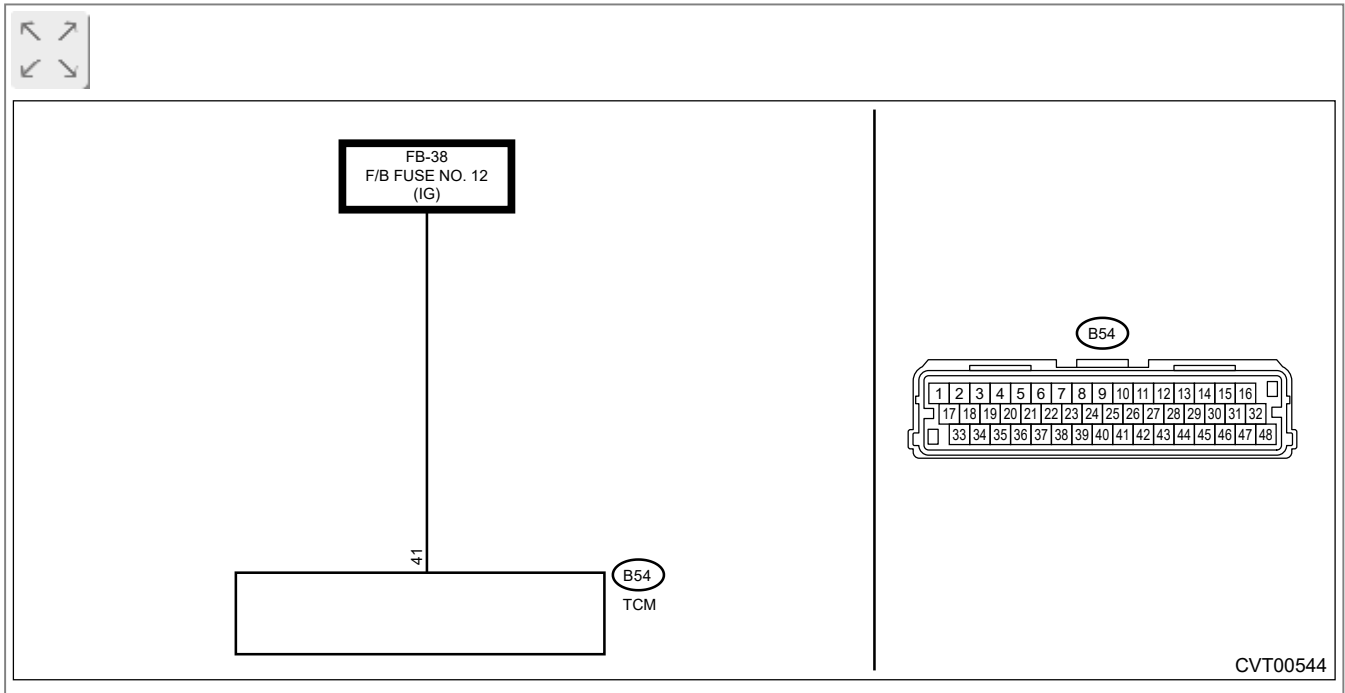
Faulty TCM operation

Caution:

Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

Wiring diagram:


CVT control system  [Ref. to WIRING SYSTEM>CVT Control System.](#)



1. CHECK CONNECTOR.

Check the installing condition of TCM connector.

Is the TCM connector installed properly?

 [Go to 2.](#)

Install the TCM connector.

2. CHECK INPUT VOLTAGE OF TCM.

1. Turn the ignition switch to ON.

2. Measure the voltage between TCM connector and chassis ground. (While wiggling the harness)

Connector & terminal

(B54) No. 41 (+) – Chassis ground (-):

Is the voltage 8 V or more?

Yes

Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, the following items may be the cause of fault.

- Open circuit or short circuit to ground of harness between TCM connector and ignition switch connector (IG relay 1 connector for model with push button start)
- Poor contact of ignition switch connector (IG relay 1 connector for model with push button start)
- Poor contact of ignition switch (IG relay 1 for model with push button start)

No

repair the harness and connector.

Note:

In this case, repair the following item:

- Open circuit or short circuit to ground of harness between TCM connector and ignition switch connector (IG relay 1 connector for model with push button start)
- Poor contact of ignition switch connector (IG relay 1 connector for model with push button start)
- Poor contact of ignition switch (IG relay 1 for model with push button start)

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of ignition SW circuit.
- Judge as NG if the ignition SW signals are lost 5 times or more even though the engine is ON.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10.9 V
Engine speed	≥ 400 rpm

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Count of temporarily discontinuous input of ignition switch	≥ 5 count

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2746 INTERMEDIATE SHAFT SPEED SENSOR "B" CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Standing start problems
- Shock occurs when engaging the lockup clutch.
- Shock occurs when selecting shift position.

1. CHECK DTC. ▼

Read the DTC using Subaru Select Monitor.

Besides DTC P2746, is any of the DTCs P2747, U0100 and U0401 displayed?

Perform the diagnosis according to DTCs other than P2746.

Perform the diagnosis according to DTC P2747. [📄 Ref. to TRANSMISSION \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P2747 INTERMEDIATE SHAFT SPEED SENSOR "B" CIRCUIT NO SIGNAL.](#)

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

Diagnosis 1

- Detect the malfunction of primary speed sensor signal characteristics.
- Judge as NG if the primary speed, compared with the speeds of other parts, is outside the possible range considering the hardware capabilities.

Diagnosis 2

- Detect the malfunction of primary speed sensor signal characteristics.
- Judge as NG if the primary speed exceeds the predetermined value.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
Diagnosis 1	
12 V battery system voltage	≥ 9 V
Transmission range	Drive or Reverse
(Measured turbine shaft speed / Measured secondary pulley shaft speed)	≥ 0.4 and ≤ 2.55
Diagnosis 2	
12 V battery system voltage	≥ 9 V
Transmission range	Drive or Reverse

(Measured turbine shaft speed / Measured secondary pulley shaft speed)	≥ 0.4 and ≤ 2.55
--	------------------------

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Diagnosis 1	
(Measured primary pulley shaft speed / Measured secondary pulley shaft speed)	< 0.36 or > 2.80
Diagnosis 2	
Measured primary pulley shaft speed	> 7140 rpm

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect the malfunction of primary speed sensor signal characteristics.
- Judge as NG if the turbine speed, compared with the engine speed, is outside the possible range considering the hardware capabilities.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Engine speed	≥ 400 rpm

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured primary pulley shaft speed × Primary reduction gear ratio*	< Table 1 rpm

Primary reduction gear ratio* : 1.129

Table 1

Engine speed (rpm)	3700	3727	3755	3782	3856	4019	4213	4456
Measured primary pulley shaft speed × Primary reduction gear ratio (rpm)	0	500	1000	1500	2000	2500	3000	3500

Engine speed (rpm)	4786	5213	5651	6101	6569	7044	7520
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Measured primary pulley shaft speed × Primary reduction gear ratio (rpm)	4000	4500	5000	5500	6000	6500	7000
--	------	------	------	------	------	------	------

Time needed for diagnosis: 10 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2747 INTERMEDIATE SHAFT SPEED SENSOR "B" CIRCUIT NO SIGNAL

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Standing start problems
- Shock occurs when engaging the lockup clutch.
- Shock occurs when selecting shift position.

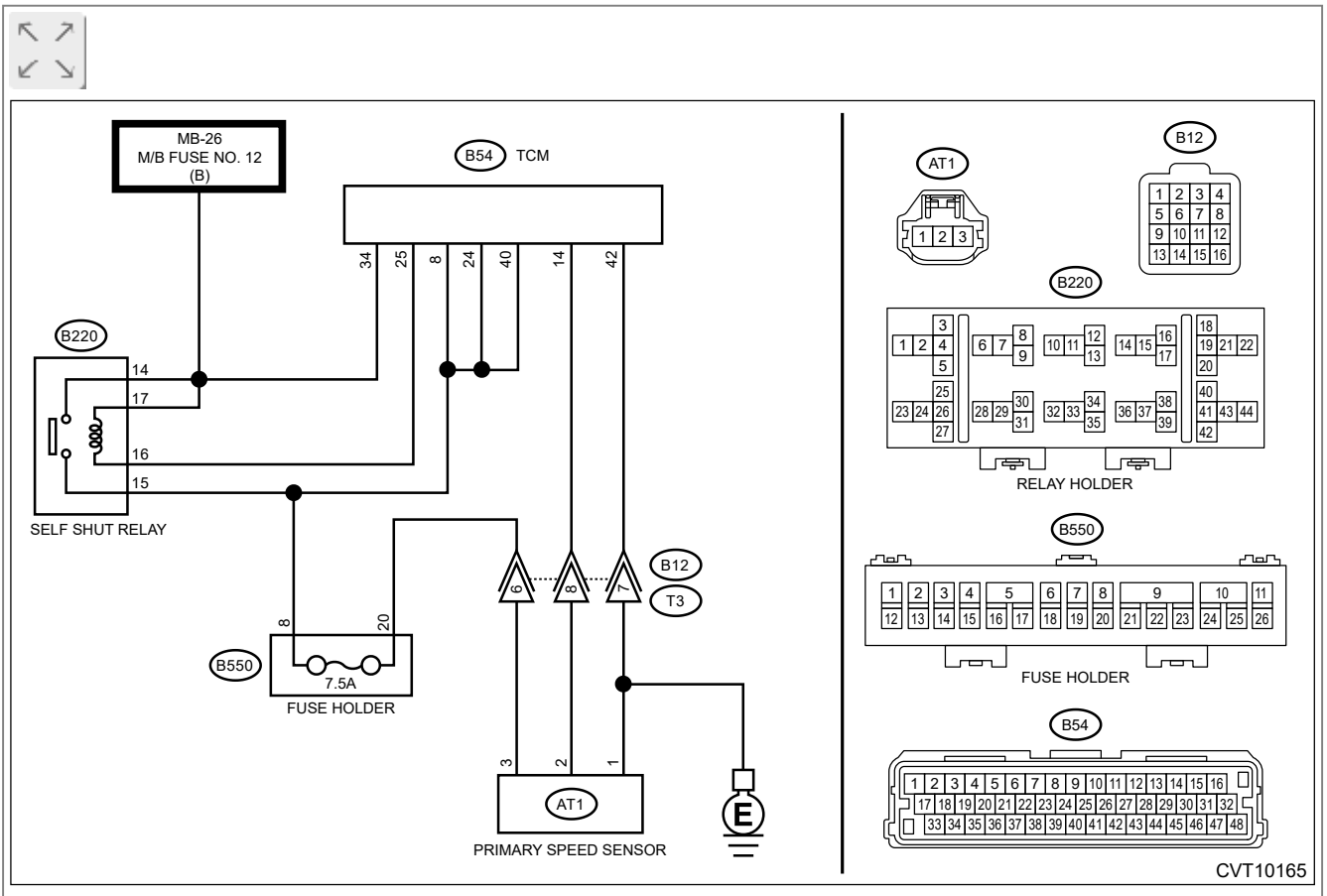
Caution:

Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

Wiring diagram:

- Non-turbo model

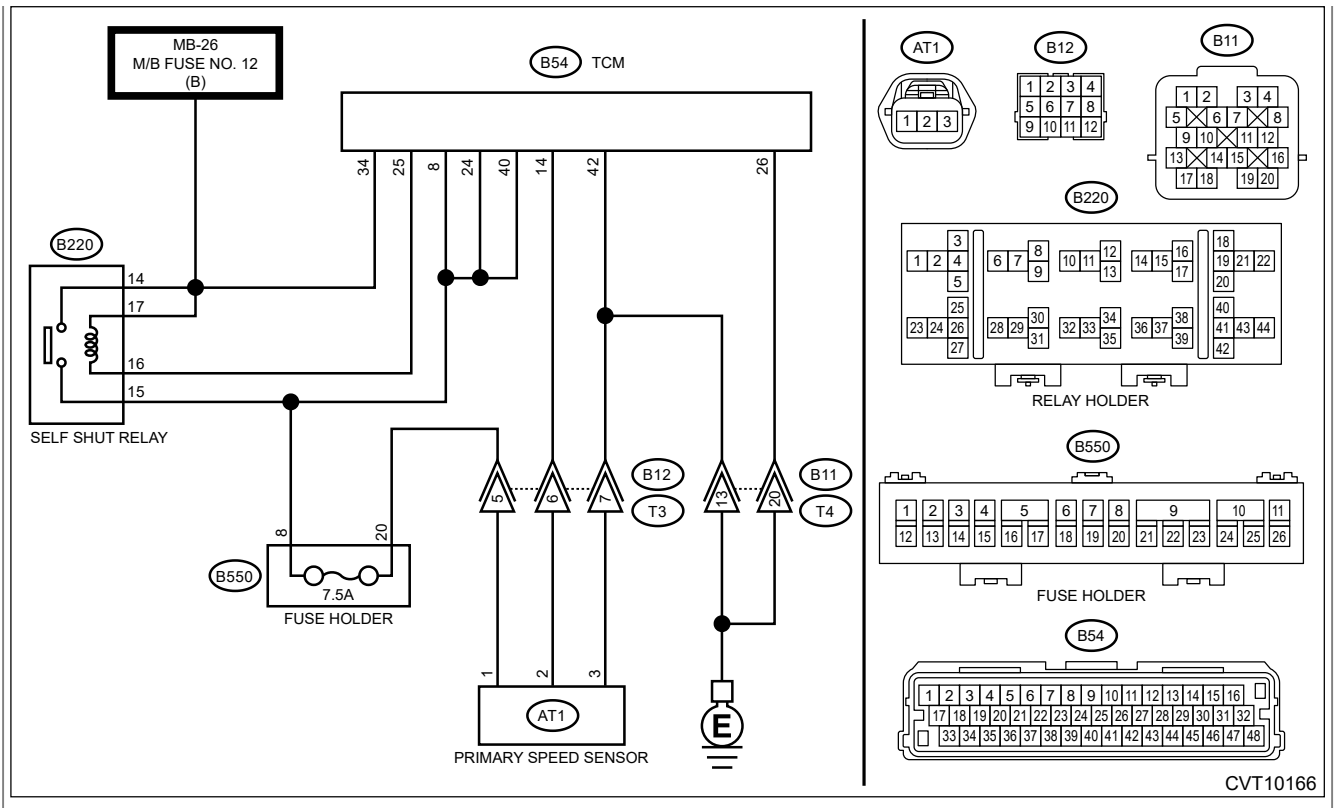
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model

CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





CVT10166

1. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Remove the fuse (7.5 A) from the fuse holder.
3. Check the fuse.

Is the check result OK?

Yes

[Go to 2.](#)

No

Replace the fuse. If the fuse blows out easily, repair the short circuit of harness.

2. CHECK HARNESS.


1. Disconnect the TCM connector.
2. Remove the self shut relay.
3. Measure the resistance between TCM connector and relay holder.

Connector & terminal

- (B54) No. 25 — (B220) No. 16:
- (B54) No. 8 — (B220) No. 15:
- (B54) No. 24 — (B220) No. 15:
- (B54) No. 40 — (B220) No. 15:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit of harness.

3. CHECK HARNESS.



Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(B54) No. 25 — Chassis ground:


(B54) No. 8 — Chassis ground:

(B54) No. 24 — Chassis ground:

(B54) No. 40 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair the short circuit of harness.

4. CHECK RELAY POWER SUPPLY.



Measure the voltage between relay holder and chassis ground.


Connector & terminal

(B220) No. 14 (+) — Chassis ground (-):

(B220) No. 17 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 5.](#)

No

Repair the open or short circuit of harness.

5. CHECK SELF SHUT RELAY.




Measure the resistance between self shut relay terminals.

Terminals

No. 16 — No. 17:

Is the resistance 110 — 140 Ω ?

Yes

 [Go to 6.](#)

No

Replace the self shut relay.

6. CHECK SELF SHUT RELAY.




Measure the resistance between self shut relay terminals.

Terminals

No. 14 — No. 15:

Is the resistance 1 MΩ or more?

Yes

 [Go to 7.](#)

No

Replace the self shut relay.

7. CHECK INPUT SIGNAL FOR TCM.




1. Connect the TCM connector.
2. Install the self shut relay.
3. Read the data of [Control Module Voltage] using Subaru Select Monitor.

Is [Control Module Voltage] 10 V or more?

Yes

Current condition is normal. Check for poor contact in connectors or harnesses, and repair the defective part.

No

 [Go to 8.](#)

8. CHECK HARNESS.



1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Measure the resistance between TCM connector and transmission connectors.

Connector & terminal

Non-turbo model

(B54) No. 14 — (B12) No. 8:

(B54) No. 42 — (B12) No. 7:

(B550) No. 20 — (B12) No. 6:

Turbo model

(B54) No. 26 — (B11) No. 20:

(B54) No. 42 — (B11) No. 13:


(B54) No. 14 — (B12) No. 6:

(B54) No. 42 — (B12) No. 7:

(B550) No. 20 — (B12) No. 5:

Is the resistance less than 1 Ω ?

Yes

 [Go to 9.](#)

No

Repair the open circuit of harness.

9. CHECK HARNESS.




Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(B54) No. 14 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 10.](#)

No

Repair the short circuit of harness.

10. CHECK HARNESS.




Measure the resistance between relay holder and fuse holder.

Connector & terminal

(B220) No. 15 — (B550) No. 8:

Is the resistance less than 1 Ω ?

Yes

 [Go to 11.](#)

No

Repair the open circuit of harness.

11. CHECK TRANSMISSION HARNESS.



1. Install the fuse.
2. Connect the TCM connector.
3. Turn the ignition switch to ON.

4. Measure the voltage between transmission connector terminals.

Connector & terminal

Non-turbo model


(B12) No. 6 (+) — Chassis ground (—):

Turbo model

(B12) No. 5 (+) — Chassis ground (—):

Is the voltage 10 — 13 V?

Yes

 [Go to 12.](#)

No

Repair the open circuit of harness or poor contact of connector.

12. CHECK INPUT SIGNAL FOR TCM.




1. Turn the ignition switch to OFF.
2. Connect the transmission connector.
3. Lift up the vehicle.
4. Start the engine.
5. Set the select lever to "D" range.
6. Read the data of [Primary Rev Speed] using Subaru Select Monitor.

Does the value of [Primary Rev Speed] change according to the [Turbine Revolution Speed]?

Yes

Current condition is normal. Repair the poor contacts of harnesses of primary speed sensor and transmission connector.

No

 [Go to 13.](#)

13. CHECK TRANSMISSION HARNESS.



1. Turn the ignition switch to OFF.
2. Disconnect the transmission connector.
3. Disconnect the primary speed sensor connector.
4. Measure the resistance between transmission connector and primary speed sensor connector.

Connector & terminal

Non-turbo model

(T3) No. 6 — (AT1) No. 3:

(T3) No. 7 — (AT1) No. 1:

(T3) No. 8 — (AT1) No. 2:

Turbo model


(T3) No. 5 — (AT1) No. 1:

(T3) No. 6 — (AT1) No. 2:

(T3) No. 7 — (AT1) No. 3:

Is the resistance less than 1 Ω ?

Yes

 [Go to 14.](#)

No

Replace the transmission harness.

14. CHECK PRIMARY SPEED SENSOR HARNESS.



Measure the resistance between transmission connector and chassis ground.

Connector & terminal

Non-turbo model

(T3) No. 6 — Chassis ground:

(T3) No. 8 — Chassis ground:


Turbo model

(T3) No. 5 — Chassis ground:

(T3) No. 6 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes




 [Go to 15.](#)

No

Repair the short circuit of harness.


15. CHECK PRIMARY SPEED SENSOR.



1. Turn the ignition switch to OFF.
2. Replace the primary speed sensor.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Primary Speed Sensor.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Primary Speed Sensor.](#)
3. Clear the memory.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Clear memory.](#)
4. Read the DTC.

Is DTC P2747 displayed?

Yes


 [Go to 16.](#)

No

The original primary speed sensor is defective.



16. CHECK SELF SHUT RELAY.



1. Turn the ignition switch to OFF.
2. Replace the self shut relay.
3. Clear the memory.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Clear memory.](#)
4. Read the DTC.

Is DTC P2747 displayed?

Yes

Replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

The original self shut relay is defective.

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect no input signal from the primary speed sensor.
- Judge as NG if there is no input signal from the primary pulley speed sensor, while the secondary pulley speed sensor has the input signal although the primary and secondary pulleys are interlocked via the chain.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 9 V
Measured secondary pulley shaft speed	≥ 500 rpm

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured primary pulley shaft speed	0 rpm

Time needed for diagnosis: 0.5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect no input signal from the primary speed sensor.
- Judge as NG if there is no input signal from the primary pulley speed sensor, while the secondary pulley speed sensor has the input signal although the primary and secondary pulleys are interlocked via the chain.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Engine speed	≥ 400 rpm
Measured secondary pulley shaft speed	≥ 500 rpm

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured primary pulley shaft speed	0 rpm

Time needed for diagnosis: 0.5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2750 INTERMEDIATE SHAFT SPEED SENSOR "C" CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Shifting shock is felt.
- Acceleration is poor during standing start.
- Shift control malfunction

1. CHECK DTC.


Read the DTC using Subaru Select Monitor.

Besides DTC P2750, is DTC P2747 or P2751 displayed?

Yes

Perform the diagnosis according to DTCs other than P2750.

No

Perform the diagnosis according to DTC P2751.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P2751 INTERMEDIATE SHAFT SPEED SENSOR "C" CIRCUIT NO SIGNAL.](#)

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect the malfunction of the secondary speed sensor characteristics.
- Judge as NG if the deviation of vehicle speed between VDC and the secondary speed sensor becomes the predetermined value or more.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Vehicle speed (from vehicle dynamics control module)	≥ 5 MPH

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Vehicle speed (calculated from secondary pulley shaft speed) - Vehicle speed (from vehicle dynamics control module)	> 10 MPH

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

Diagnosis 1

- Detect the malfunction of secondary speed sensor signal characteristics.
- Judge as NG if the secondary speed, compared with the primary speed, is outside the possible range considering the hardware capabilities.

Diagnosis 2

- Detect the malfunction of secondary speed sensor signal characteristics.
- Judge as NG if the secondary speed exceeds the predetermined value.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
Diagnosis 1	
12 V battery system voltage	≥ 9 V
Transmission range	Drive or Reverse
Measured primary pulley shaft speed / Measured front output shaft speed	≥0.36 and ≤2.34
Diagnosis 2	
12 V battery system voltage	≥ 9 V
Transmission range	Drive or Reverse
Measured primary pulley shaft speed / Measured front output shaft speed	≥0.36 and ≤2.34

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Diagnosis 1	
Measured primary pulley shaft speed / Measured secondary pulley shaft speed	< 0.33 or > 2.58
Diagnosis 2	
Measured secondary pulley shaft speed	> 9900 rpm

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2751 INTERMEDIATE SHAFT SPEED SENSOR "C" CIRCUIT NO SIGNAL

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Shifting shock is felt.
- Acceleration is poor during standing start.
- Shift control malfunction

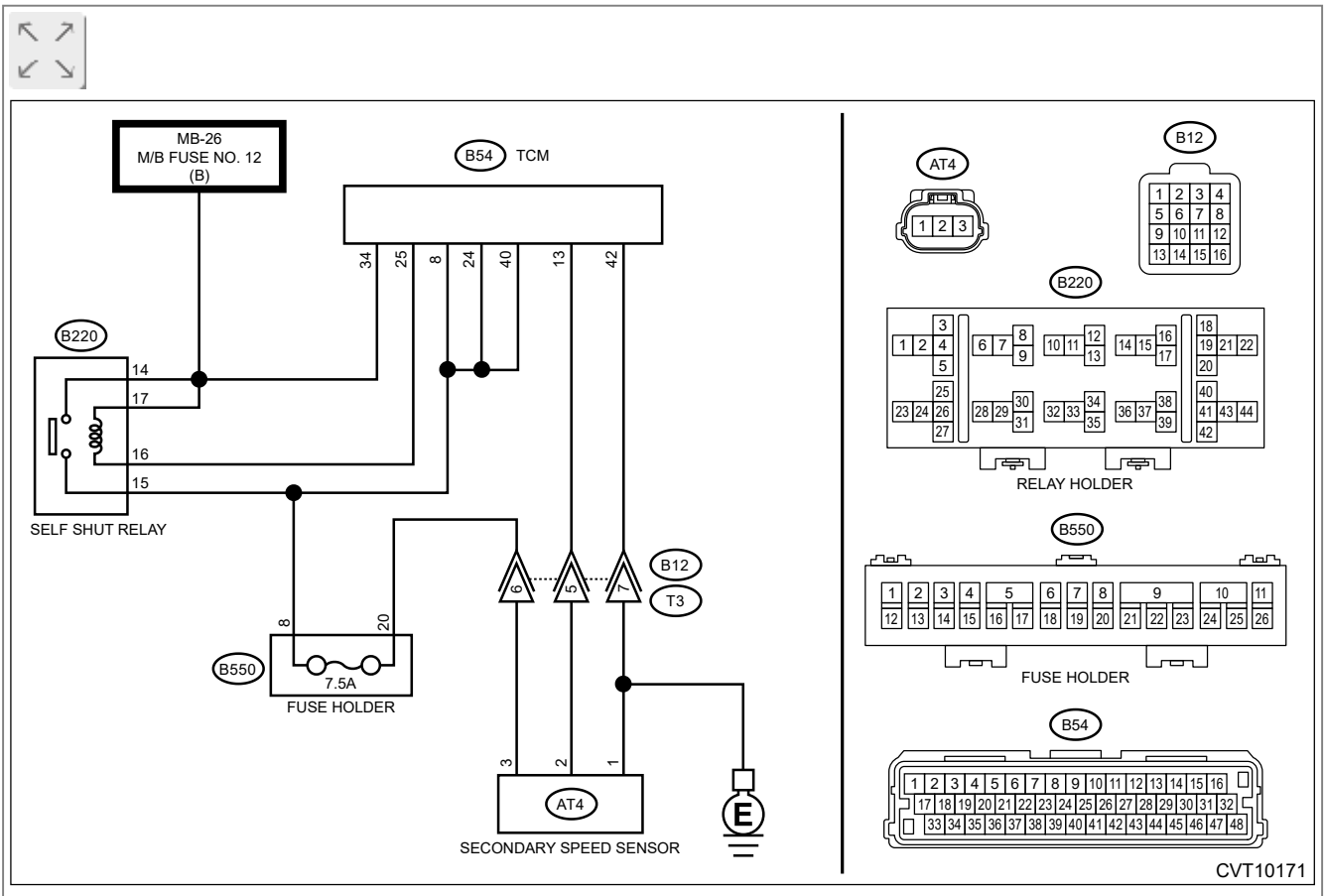
Caution:

Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

Wiring diagram:

- Non-turbo model

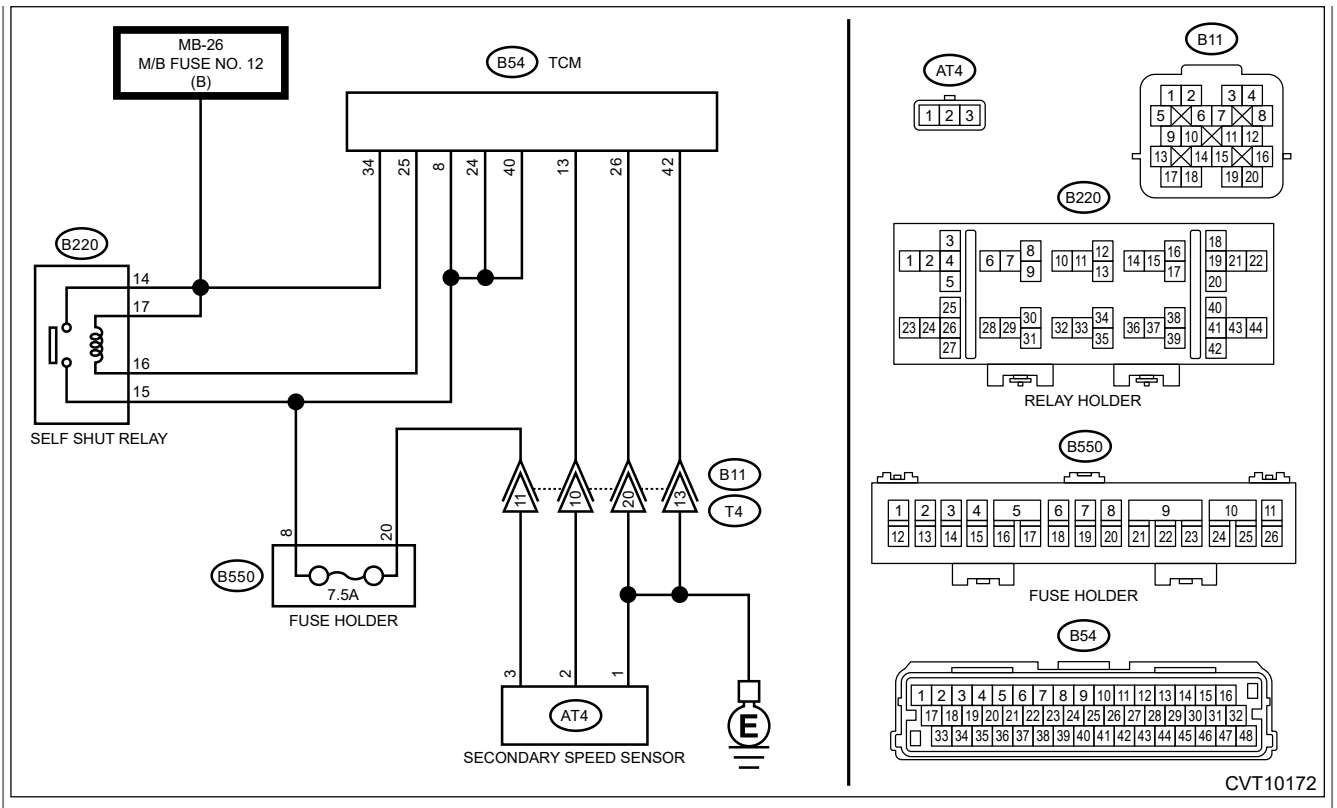
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model

CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)






1. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Remove the fuse (7.5 A) from the fuse holder.
3. Check the fuse.

Is the check result OK?

Yes

 [Go to 2.](#)

No

Replace the fuse. If the fuse blows out easily, repair the short circuit of harness.

2. CHECK HARNESS.


1. Disconnect the TCM connector.
2. Remove the self shut relay.
3. Measure the resistance between TCM connector and relay holder.

Connector & terminal

- (B54) No. 25 — (B220) No. 16:
- (B54) No. 8 — (B220) No. 15:
- (B54) No. 24 — (B220) No. 15:
- (B54) No. 40 — (B220) No. 15:

Is the resistance less than 1 Ω ?

Yes

 [Go to 3.](#)

No

Repair the open circuit of harness.

3. CHECK HARNESS.



Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(B54) No. 25 — Chassis ground:


(B54) No. 8 — Chassis ground:

(B54) No. 24 — Chassis ground:

(B54) No. 40 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 4.](#)

No

Repair the short circuit of harness.

4. CHECK RELAY POWER SUPPLY.



Measure the voltage between relay holder and chassis ground.

Connector & terminal

(B220) No. 14 (+) — Chassis ground (-):

(B220) No. 17 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes

 [Go to 5.](#)

No

Repair the open or short circuit of harness.

5. CHECK SELF SHUT RELAY.




Measure the resistance between self shut relay terminals.

Terminals

No. 16 — No. 17:

Is the resistance 110 — 140 Ω ?

Yes

 [Go to 6.](#)

No

Replace the self shut relay.

6. CHECK SELF SHUT RELAY.



Measure the resistance between self shut relay terminals.

Terminals

No. 14 — No. 15:

Is the resistance 1 MΩ or more?

Yes

 [Go to 7.](#)

No

Replace the self shut relay.

7. CHECK INPUT SIGNAL FOR TCM.




1. Connect the TCM connector.
2. Install the self shut relay.
3. Read the data of [Control Module Voltage] using Subaru Select Monitor.

Is [Control Module Voltage] 10 V or more?

Yes

Current condition is normal. Check for poor contact in connectors or harnesses, and repair the defective part.

No

 [Go to 8.](#)

8. CHECK HARNESS.



1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Measure the resistance between TCM connector and transmission connectors.

Connector & terminal

Non-turbo model

(B54) No. 13 — (B12) No. 5:

(B54) No. 42 — (B12) No. 7:


(B550) No. 20 — (B12) No. 6:

Turbo model

(B54) No. 13 — (B11) No. 10:
(B54) No. 26 — (B11) No. 20:
(B54) No. 42 — (B11) No. 13:
(B550) No. 20 — (B11) No. 11:

Is the resistance less than 1 Ω ?

Yes

 [Go to 9.](#)

No

Repair the open circuit of harness.

9. CHECK HARNESS.




Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(B54) No. 13 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes

 [Go to 10.](#)

No

Repair the short circuit of harness.

10. HARNESS AND INSPECTION.




Measure the resistance between relay holder and fuse holder.

Connector & terminal

(B220) No. 15 — (B550) No. 8:

Is the resistance less than 1 Ω ?

Yes

 [Go to 11.](#)

No

Repair the open circuit of harness.

11. CHECK TRANSMISSION HARNESS.



1. Install the fuse.
2. Connect the TCM connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between transmission connector terminals.

Connector & terminal

Non-turbo model


(B12) No. 6 (+) — Chassis ground (—):

Turbo model

(B11) No. 11 (+) — Chassis ground (—):

Is the voltage 10 — 13 V?

Yes

 [Go to 12.](#)

No

Repair the open circuit of harness or poor contact of connector.

12. CHECK INPUT SIGNAL FOR TCM.

1. Turn the ignition switch to OFF.
2. Connect the transmission connector.
3. Lift up the vehicle.
4. Start the engine.
5. Set the select lever to "D" range.
6. Read the data of [Secondary Rev Speed] using Subaru Select Monitor.

Does the value of [Secondary Rev Speed] change according to the [Front Wheel Speed]?

Yes

Current condition is normal. Repair the poor contacts of harnesses of secondary speed sensor and transmission connector.

No

 [Go to 13.](#)

13. CHECK TRANSMISSION HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the transmission connector.
3. Disconnect the secondary speed sensor connector.
4. Measure the resistance between transmission connector and secondary speed sensor connector.

Connector & terminal

Non-turbo model

(T3) No. 5 — (AT4) No. 2:

(T3) No. 6 — (AT4) No. 3:

(T3) No. 7 — (AT4) No. 1:

Turbo model

(T4) No. 10 — (AT4) No. 2:


(T4) No. 11 — (AT4) No. 3:

(T4) No. 13 — (AT4) No. 1:

(T4) No. 20 — (AT4) No. 1:

Is the resistance less than 1 Ω ?

Yes

 [Go to 14.](#)

No

Replace the transmission harness.

14. CHECK SECONDARY SPEED SENSOR HARNESS.



Measure the resistance between transmission connector and chassis ground.

Connector & terminal

Non-turbo model

(T3) No. 5 — Chassis ground:

(T3) No. 6 — Chassis ground:


Turbo model

(T4) No. 10 — Chassis ground:

(T4) No. 11 — Chassis ground:

Is the resistance 1 M Ω or more?

Yes




 [Go to 15.](#)

No

Repair the short circuit of harness.

15. CHECK SECONDARY SPEED SENSOR.



1. Turn the ignition switch to OFF.
2. Replace the secondary speed sensor.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Secondary Speed Sensor.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Secondary Speed Sensor.](#)
3. Clear the memory.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Clear memory.](#)
4. Read the DTC.

Is DTC P2751 displayed?

Yes

 [Go to 16.](#)

No

The original secondary speed sensor is defective.

16. CHECK SELF SHUT RELAY.



1. Turn the ignition switch to OFF.
2. Replace the self shut relay.
3. Clear the memory. [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Clear memory.](#)
4. Read the DTC.

Is DTC P2751 displayed?

Yes

Replace the TCM. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

The original self shut relay is defective.

1. OUTLINE OF DIAGNOSIS

- Detect the no input signal from the secondary speed sensor.
- Judge as NG if there is no input signal from the secondary pulley speed sensor, while the primary pulley speed sensor has the input signal although the primary and secondary pulleys are interlocked via the chain.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 9 V
Transmission range	Drive or Reverse
Measured primary pulley shaft speed	≥ 1000 rpm

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured secondary pulley shaft speed	0 rpm

Time needed for diagnosis: 0.5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2758 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT STUCK ON

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

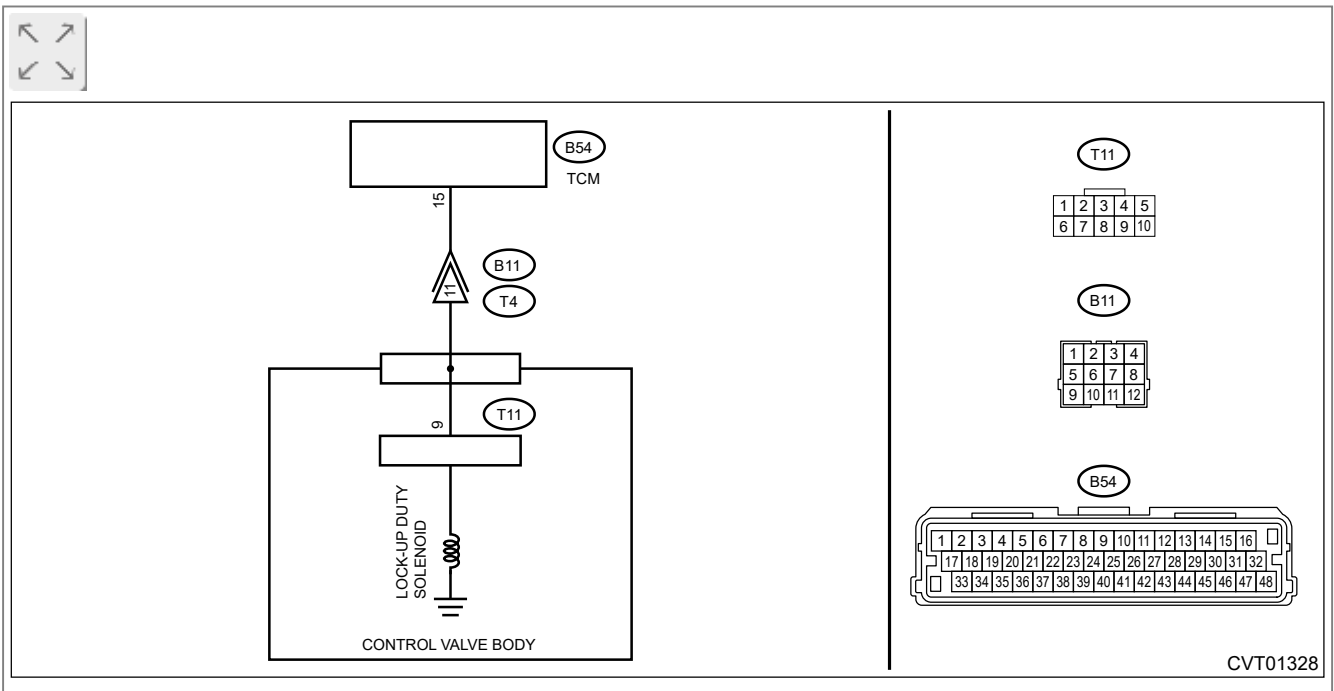
Trouble symptom:

The engine stalls when the vehicle is stopped.

Wiring diagram:

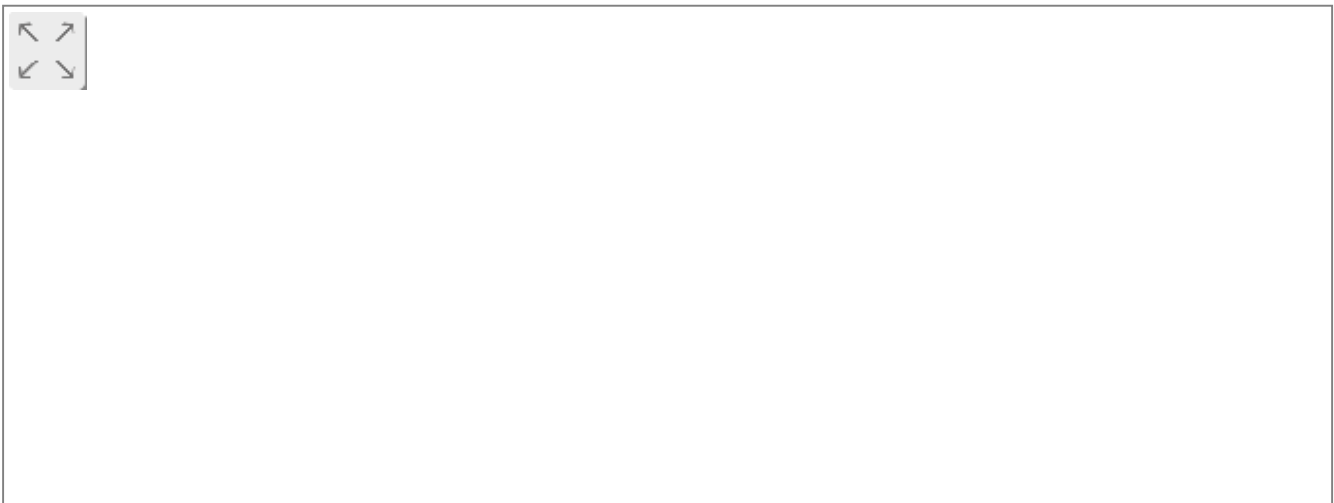
- Non-turbo model

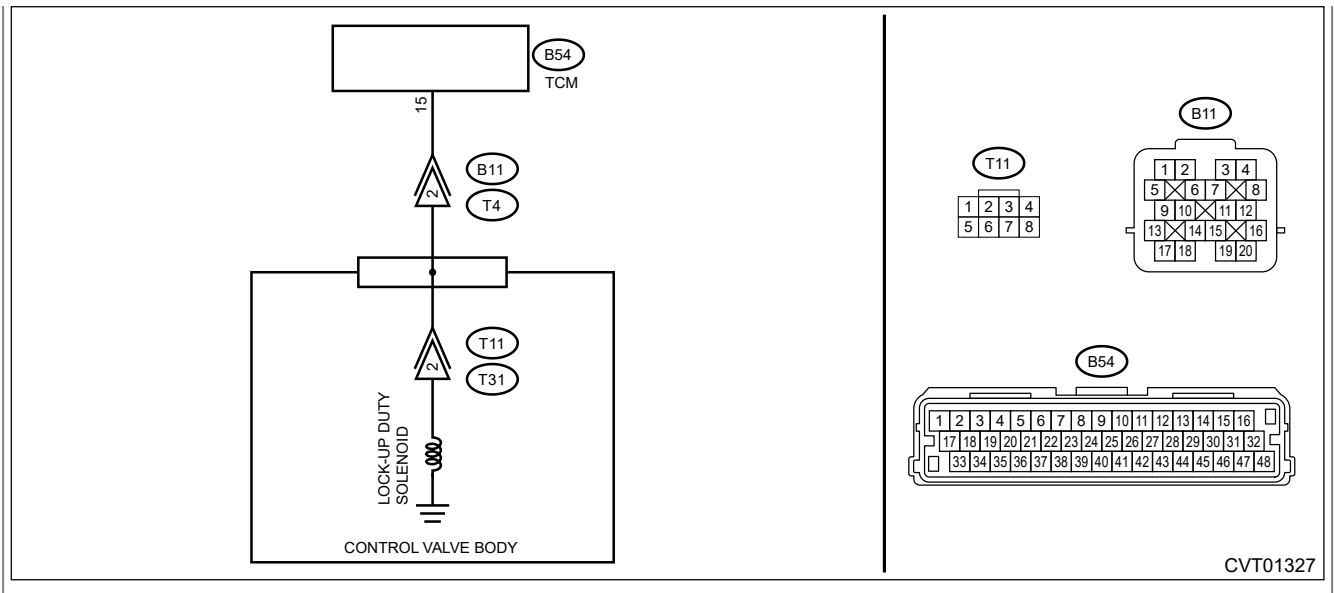
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model

CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





CVT01327

1. CHECK DTC.

Read the DTC using Subaru Select Monitor.

Is any DTC other than DTC P2758 displayed?

- Perform the diagnosis according to DTCs other than P2758.
- [Go to 2.](#)

2. CHECK LOCK-UP DUTY SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform forced operation of the lock-up duty solenoid.
 - [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Active Test.](#)

Does the indication of 0 → 50% appear repeatedly during forced operation, and does operating sound emit during indicating 50%?

- [Go to 8.](#)
- [Go to 3.](#)

3. CHECK LOCK-UP DUTY SOLENOID.

1. Turn the ignition switch to OFF.

2. Disconnect the transmission connector.
3. Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model



(T4) No. 11 — Transmission body:

Turbo model

(T4) No. 2 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω ? (when cold)

Yes

Replace the control valve body.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

No

 [Go to 4.](#)

4. CHECK HARNESS.



1. Disconnect the TCM connector.
2. Measure the resistance between TCM connector and transmission connectors.

Connector & terminal

Non-turbo model


(B54) No. 15 — (B11) No. 11 :

Turbo model

(B54) No. 15 — (B11) No. 2 :

Is the resistance less than 1 Ω ?

Yes

 [Go to 5.](#)

No

Repair the open circuit of harness.

5. CHECK HARNESS.



Measure the resistance between TCM connector and transmission body.

Connector & terminal

(B54) No. 15 — Transmission body:

Is the resistance 1 M Ω or more?

Yes

 [Go to 6.](#)

No

Repair the short circuit of harness.

6. CHECK HARNESS.

Caution:

Start work after ATF cools down.

1. Remove the following parts.
 - Transmission valve cover (non-turbo model)
 - Transmission oil pan (turbo model)
2. Disconnect the control valve body connector.
3. Measure the resistance between transmission connector and control valve body connector.

Connector & terminal

Non-turbo model


(T4) No. 11 — (T11) No. 9 :

Turbo model

(T4) No. 2 — (T11) No. 2 :

Is the resistance less than 1 Ω ?

Yes

 [Go to 7.](#)

No

Repair the open circuit of harness.

7. CHECK HARNESS.

Measure the resistance between transmission connector and control valve body connector.

Connector & terminal

Non-turbo model



(T11) No. 9 — Control valve body:

Turbo model

(T11) No. 2 — Control valve body:

Is the resistance 1 M Ω or more?


Yes


Replace the control valve body.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

No

Repair the short circuit of harness.


8. CHECK TRANSMISSION FLUID.

1. Connect all connectors.
2. Check the amount of ATF.  [Ref. to CONTINUOUSLY VARIABLE](#)



[TRANSMISSION\(TR580\)>CVTF>ADJUSTMENT.](#)  Ref. to [CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>ADJUSTMENT.](#)

Is the check result OK?



Yes

 [Go to 9.](#)

No


Adjust the amount of ATF.  Ref. to [CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>ADJUSTMENT.](#)  Ref. to [CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>ADJUSTMENT.](#)

9. CHECK TRANSMISSION FLUID.



Check the condition of ATF.  Ref. to [CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>CONDITION CHECK.](#)  Ref. to [CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>CONDITION CHECK.](#)

Is the check result OK?

Yes

 [Go to 10.](#)

No




Check according to the "Corrective action" of ATF (CVTF) "CONDITION CHECK".  Ref. to [CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>CVTF>CONDITION CHECK.](#)  Ref. to [CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>CVTF>CONDITION CHECK.](#)

10. CHECK INPUT SIGNAL FOR TCM.


1. Lift up the vehicle.
2. Start the engine.
3. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
4. Depress the brake pedal, and shift the select lever to "D" range.
5. Shift the select lever to "P" range.
6. Stabilize the engine speed at idle.
7. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor.

Is the value of [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes

Replace the control valve body.  Ref. to [CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#)  Ref. to [CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)
 [Go to 11.](#)

No

Perform the diagnosis according to DTC P0841.  Ref. to [TRANSMISSION \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC](#)

P0841 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT RANGE/PERFORMANCE.

11. DRIVING CHECK FOR LOCK-UP CONDITION.



1. Perform the Clear Memory Mode. [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Clear memory.](#)
2. Turn the ignition switch to OFF.
3. Start the engine.
4. Warm up until the ATF temperature exceeds 50°C.
5. Drive the vehicle for one minute or more while keeping such constant speed that [Lock Up Duty Ratio] is 0%, and [Front Wheel Speed] is 5 km/h (3 MPH) or less, which are displayed on the Subaru Select Monitor.
6. Turn the ignition switch to OFF.
7. Start the engine.
8. Perform the procedure in step 5) again.
9. Read the DTC using Subaru Select Monitor.

Does the AT OIL TEMP light blink and is DTC P2758 displayed? Or does the engine stall?

Yes

Replace the torque converter assembly. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Torque Converter Assembly.](#) [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Torque Converter Assembly.](#)

No

Current condition is normal. It is possible that temporary poor contact occurs.

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect the malfunction of lock-up fluid pressure control solenoid, and hydraulic circuit, or drive circuit characteristics (stuck to high pressure side).
- Judge as NG if the deviation between engine speed and turbine speed is the predetermined value or less, even though the lock-up open request has been issued.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Engine speed	≥ 1000 rpm
Transmission range	Drive
Engine torque	> Table 1 N•m
Commanded duty of torque converter clutch pressure control solenoid	≤ 0%

Table 1

Engine coolant	- 40	- 20	0	20	40	60	80	100
----------------	------	------	---	----	----	----	----	-----

temperature (degC)								
Engine torque (N•m)	80	80	80	80	80	50	50	50

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Engine speed – Measured turbine shaft speed	< Table 2 rpm

Table 2

Engine speed (rpm)	0	500	1000	1500	2000	2500	3000	3500
Engine speed – Measured turbine shaft speed (rpm)	0	0	50	50	50	50	50	50

Engine speed (rpm)	4000	4500	5000	5500	6000	6500	7000
Engine speed – Measured turbine shaft speed (rpm)	50	50	50	50	50	50	50

Time needed for diagnosis: 10 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect the malfunction of lock-up fluid pressure control solenoid, and hydraulic circuit, or drive circuit characteristics (stuck to high pressure side).
- Judge as NG if the deviation between engine speed and primary speed is the predetermined value or less, even though the lock-up disengagement request has been sent.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Engine speed	≥ 1000 rpm
Transmission range	Drive
Engine torque	> Table 3 N•m
Commanded duty of torque converter clutch pressure control solenoid	≤ 0%

Table 3

Engine coolant temperature (degC)	- 40	- 20	0	20	40	60	80	100
Engine torque (N•m)	80	80	80	80	80	50	50	50

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Engine speed – Measured primary pulley shaft speed × Primary reduction gear ratio*	< Table 4 rpm

*Primary reduction gear ratio : 1.129

Table 4

Engine speed (rpm)	0	500	1000	1500	2000	2500	3000	3500
Engine speed – Measured primary pulley shaft speed × Primary reduction gear ratio (rpm)	0	0	50	50	50	50	50	50

Engine speed (rpm)	4000	4500	5000	5500	6000	6500	7000
Engine speed – Measured primary pulley shaft speed × Primary reduction gear ratio (rpm)	50	50	50	50	50	50	50

Time needed for diagnosis: 10 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2763 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition


Trouble symptom:

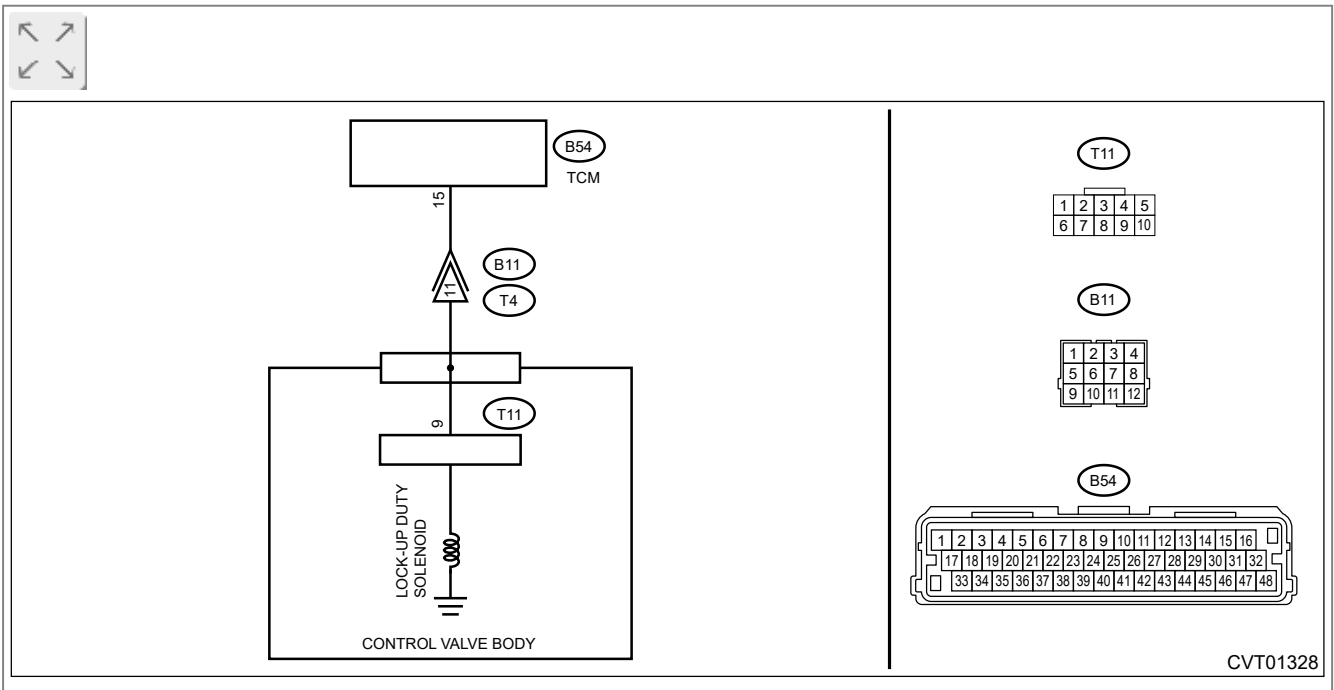
- No lock-up occurs.
- Engine stalls.


Caution:

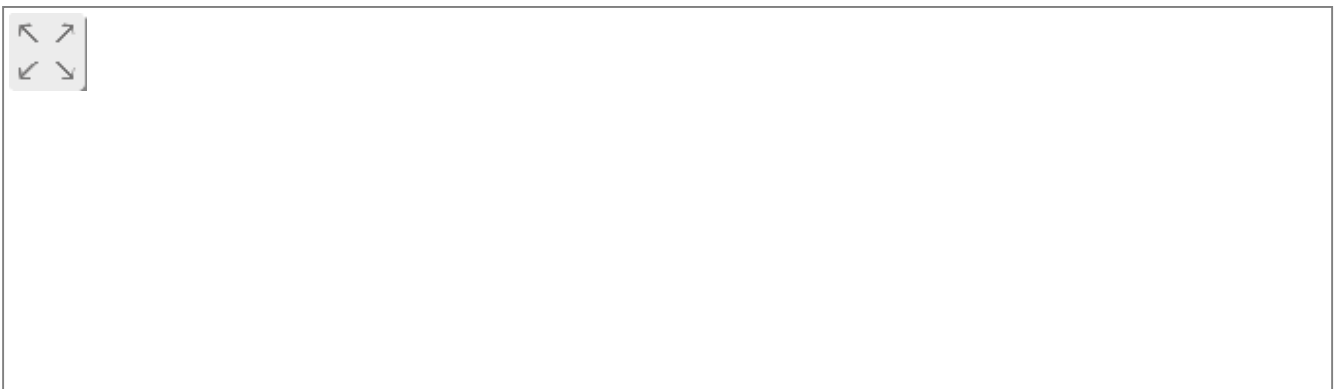
Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

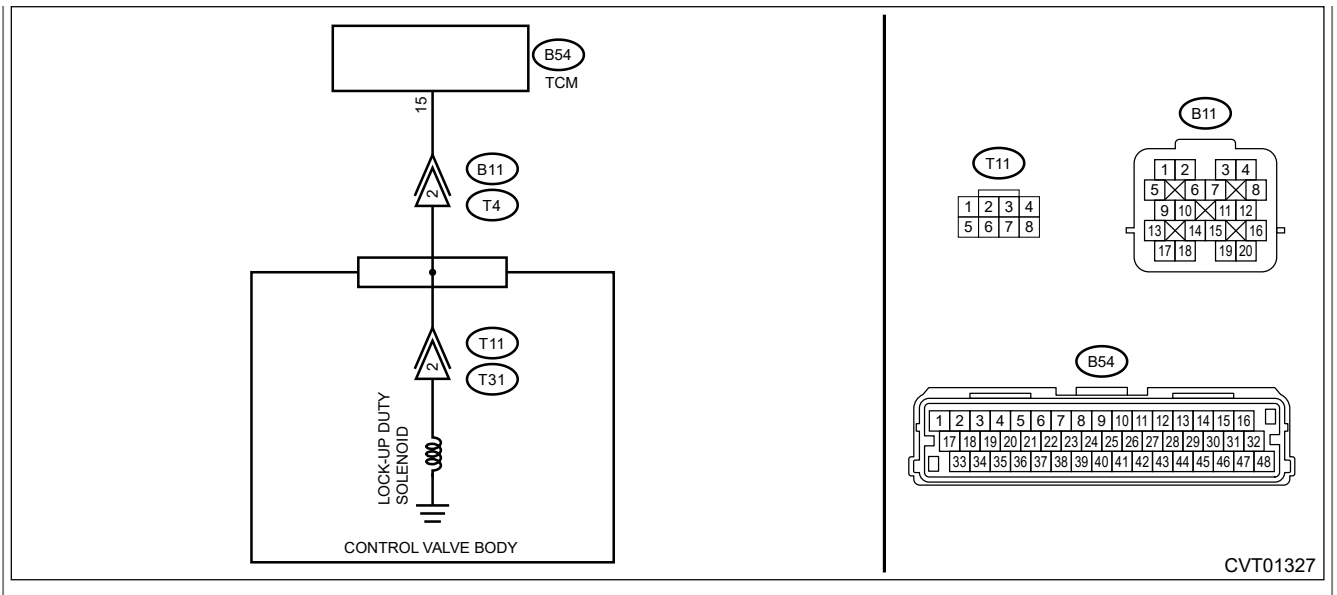
Wiring diagram:

- Non-turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





1. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Measure the resistance between TCM connector and transmission connectors.

Connector & terminal

Non-turbo model

(B54) No. 15 — (B11) No. 11:

Turbo model

(B54) No. 15 — (B11) No. 2:

Is the resistance less than 1 Ω ?

Yes

[Go to 2.](#)

No

Repair the open circuit of harness.

2. CHECK HARNESS.

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connector and chassis ground.

Connector & terminal

(B54) No. 15 (+) — Chassis ground (-):

Is the voltage approx. 0 V?

Yes

[Go to 3.](#)

No

Repair the short circuit of harness.

3. CHECK LOCK-UP DUTY SOLENOID.

Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model



(T4) No. 11 — Transmission body:

Turbo model


(T4) No. 2 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω ? (when cold)

Yes

Check for poor contact of connector, and if no fault is found, replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

 [Go to 4.](#)

4. CHECK HARNESS INSIDE TRANSMISSION.

Caution:

Start work after ATF cools down.

1. Remove the following parts.
 - Transmission valve cover (non-turbo model)
 - Transmission oil pan (turbo model)
2. Check for the harness pinch, damage.

Is there any fault in the harness?

Yes

Replace the transmission harness.

No

 [Go to 5.](#)

5. CHECK HARNESS INSIDE TRANSMISSION.

1. Disconnect the control valve body connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between transmission connector and transmission body.

Connector & terminal

Non-turbo model



(T4) No. 11 (+) — Transmission body (-):

Turbo model

(T4) No. 2 (+) — Transmission body (-):

Is the voltage approx. 0 V?

Yes

Replace the control valve body.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

No

Replace the transmission harness.

1. OUTLINE OF DIAGNOSIS

- Detect short circuit to power supply or open circuit of the lock-up clutch pressure control solenoid drive circuit.
- Judge as NG when an abnormal signal is received from the solenoid driver IC of the lock-up clutch pressure control solenoid drive circuit.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 9 V
Commanded duty of torque converter clutch pressure control solenoid	0%

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal of malfunction from solenoid driver IC	ON
As defined by: Measured torque converter clutch pressure control solenoid voltage ≥2.5 V	

Time needed for diagnosis: 0.2 s**Malfunction indicator light illumination:** Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2764 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition


Trouble symptom:

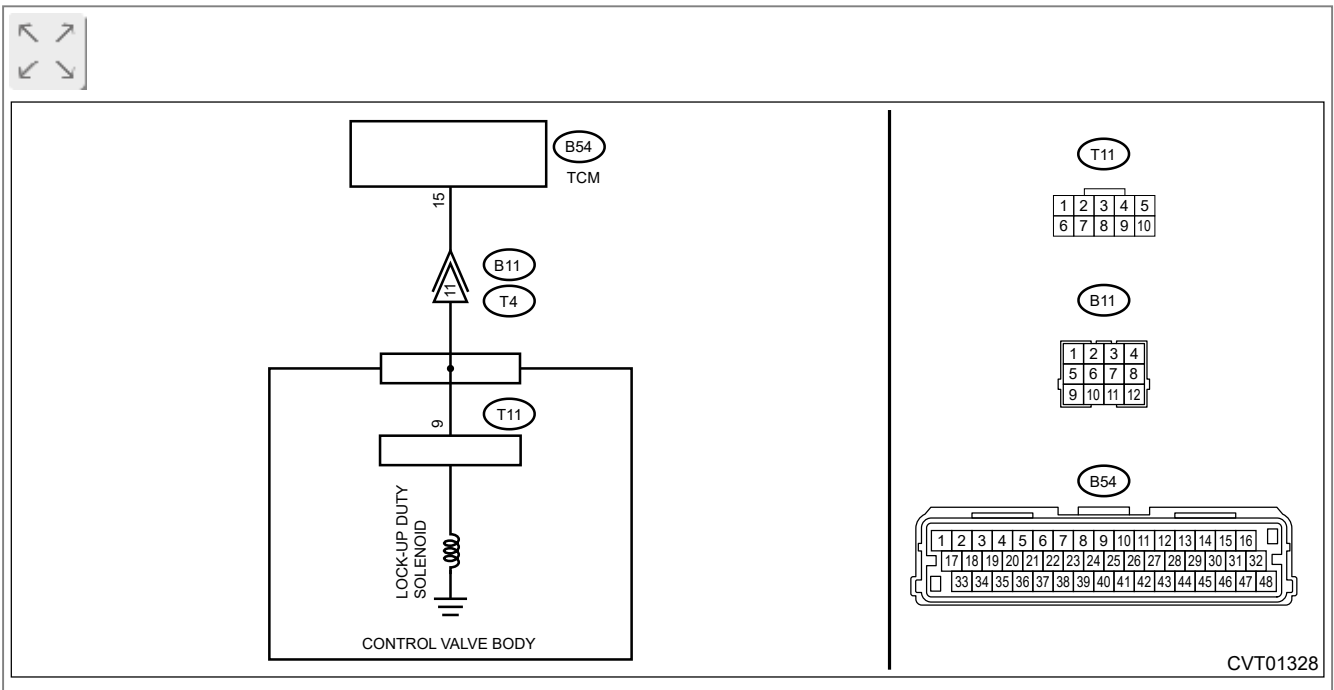
No lock-up occurs.


Caution:

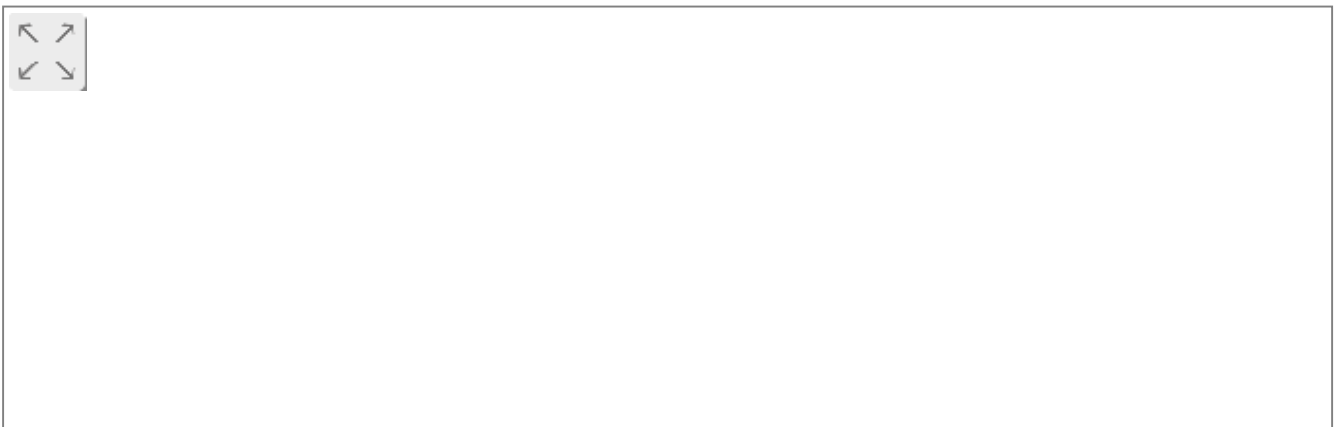
Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

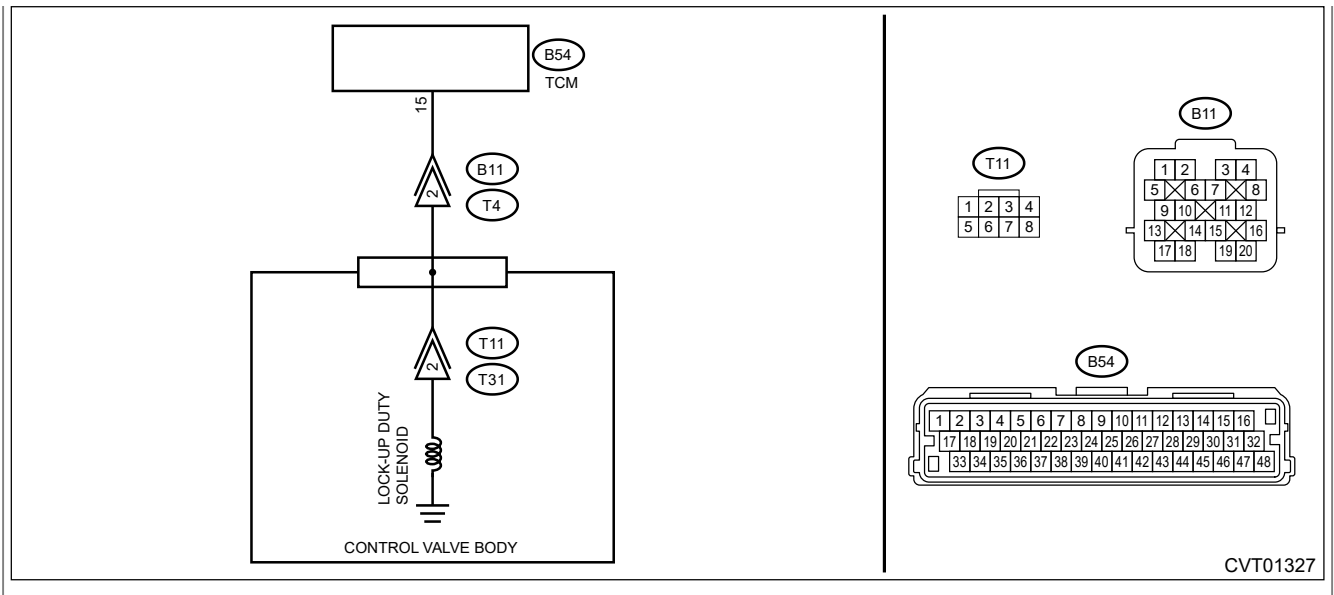
Wiring diagram:

- Non-turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > NON-TURBO MODEL.](#)



- Turbo model
CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)





CVT01327

1. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(B54) No. 15 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

[Go to 2.](#)

No

Repair the short circuit of harness.

2. CHECK LOCK-UP DUTY SOLENOID.

Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model

(T4) No. 11 — Transmission body:


Turbo model

(T4) No. 2 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω? (when cold)

Yes

Check for poor contact of connector, and if no fault is found, replace the TCM. [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control](#)

[Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

 [Go to 3.](#)

3. CHECK HARNESS INSIDE TRANSMISSION.

Caution:

Start work after ATF cools down.

1. Remove the following parts.
 - Transmission valve cover (non-turbo model)
 - Transmission oil pan (turbo model)
2. Check for the harness pinch, damage.

Is there any fault in the harness?

Yes

Replace the transmission harness.

No

 [Go to 4.](#)

4. CHECK HARNESS INSIDE TRANSMISSION.

1. Disconnect the control valve body connector.
2. Measure the resistance between transmission connector and transmission body.

Connector & terminal

Non-turbo model



(T4) No. 11 — Transmission body:

Turbo model

(T4) No. 2 — Transmission body:

Is the resistance 1 MΩ or more?

Yes

Replace the control valve body.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Control Valve Body.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

No

Replace the transmission harness.

1. OUTLINE OF DIAGNOSIS

- Detect the ground short of the lock-up clutch pressure control solenoid drive circuit.
- Judge as NG when an abnormal signal is received from the solenoid driver IC of the lock-up clutch pressure control solenoid drive circuit.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	$\geq 9 \text{ V}$
Commanded duty of torque converter clutch pressure control solenoid	100%

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal of malfunction from solenoid driver IC	ON
As defined by: Measured torque converter clutch pressure control solenoid voltage $\leq 0.8 \text{ V}$	

Time needed for diagnosis: 0.2 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2769 TORQUE CONVERTER CLUTCH CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition


Trouble symptom:

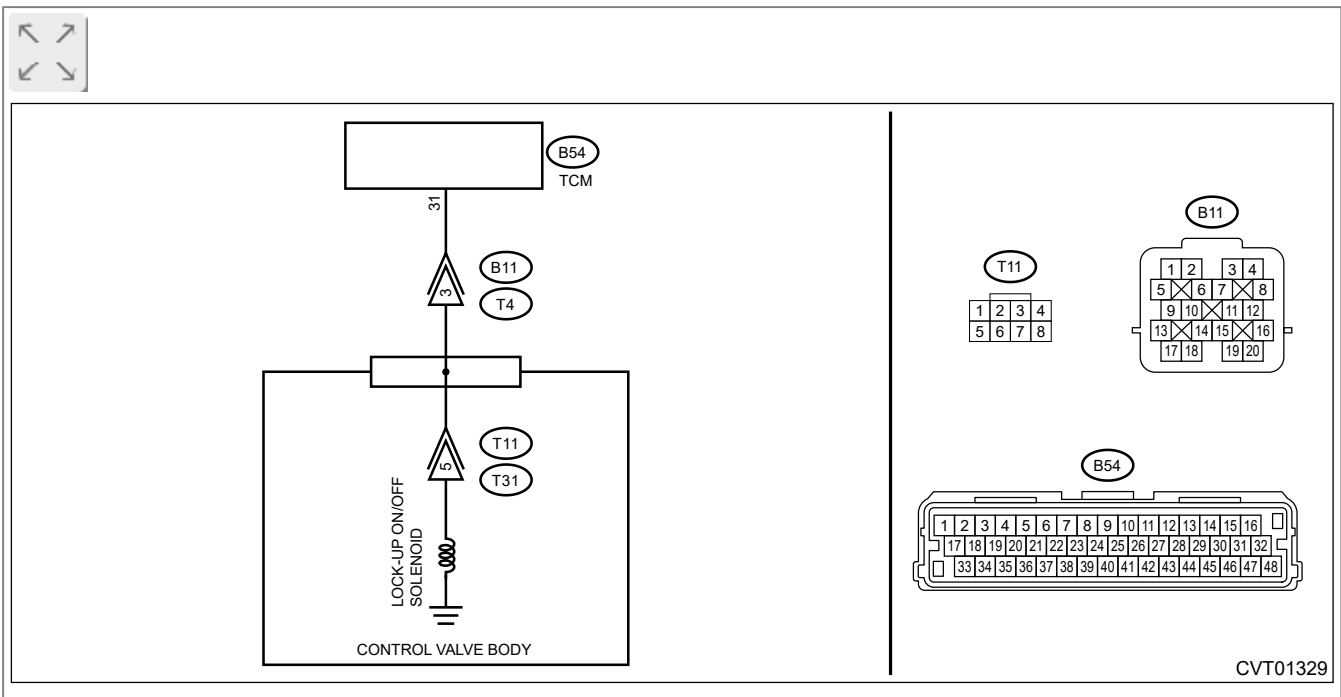
No lock-up occurs.

Caution:

Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

Wiring diagram:

CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)



1. CHECK HARNESS.


1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(B54) No. 31 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes

 [Go to 2.](#)

No

Repair the short circuit of harness.

2. CHECK LOCK UP ON/OFF SOLENOID.



Measure the resistance between transmission connector and transmission body.


Connector & terminal

(T4) No. 3 — Transmission body:


Is the resistance approximately 13 — 18.5 Ω ? (when cold)

Yes

Check for poor contact of connector, and if no fault is found, replace the TCM.

 [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

 [Go to 3.](#)

3. CHECK HARNESS INSIDE TRANSMISSION.



Caution:

Start work after ATF cools down.

1. Remove the transmission oil pan.
2. Check for the harness pinch, damage.

Is there any fault in the harness?

Yes

Replace the transmission harness.

No

 [Go to 4.](#)

4. CHECK HARNESS INSIDE TRANSMISSION.



1. Disconnect the control valve body connector.
2. Measure the resistance between transmission connector and transmission body.

Connector & terminal

(T4) No. 3 — Transmission body:

Is the resistance 1 M Ω or more?

Yes

Replace the control valve body.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

No

Replace the transmission harness.

1. OUTLINE OF DIAGNOSIS

- Detect the ground short of the lock-up clutch ON/OFF solenoid drive circuit.
- Judge as NG when an abnormal signal is received from the solenoid driver IC of the lock-up clutch ON/OFF solenoid drive circuit.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	$\geq 9 \text{ V}$
Torque converter clutch circuit control solenoid output command	ON

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal of malfunction from solenoid driver IC	ON
As defined by: Measured torque converter clutch circuit control solenoid voltage $\leq 0.8 \text{ V}$	

Time needed for diagnosis: 0.2 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2770 TORQUE CONVERTER CLUTCH CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition


Trouble symptom:

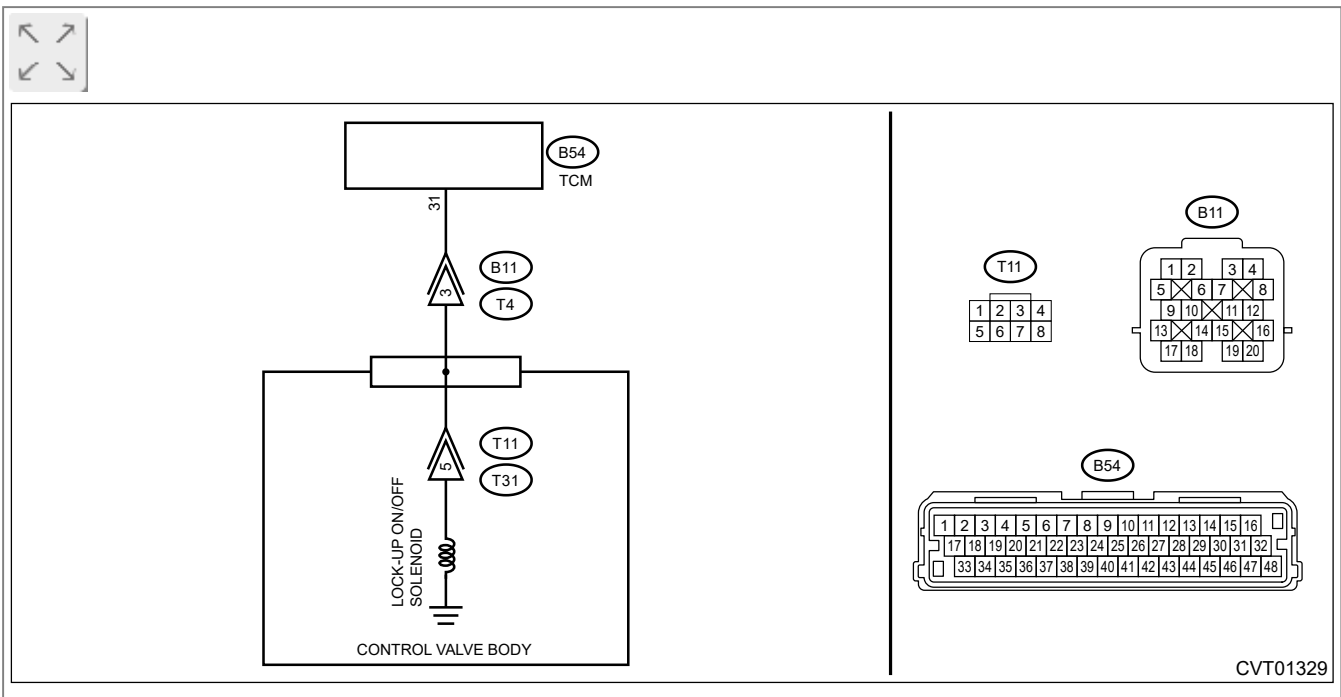
No lock-up occurs.

Caution:

Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

Wiring diagram:

CVT control system  [Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM > TURBO MODEL.](#)



1. CHECK HARNESS.


1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Measure the resistance between TCM connector and transmission connectors.

Connector & terminal

(B54) No. 31 — (B11) No. 3:

Is the resistance less than 1 Ω?

Yes

 [Go to 2.](#)

No

Repair the open circuit of harness.

2. CHECK HARNESS.




1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connector and chassis ground.

Connector & terminal

(B54) No. 31 (+) — Chassis ground (-):

Is the voltage approx. 0 V?

Yes

 [Go to 3.](#)

No

Repair the short circuit of harness.

3. CHECK LOCK UP ON/OFF SOLENOID.




Measure the resistance between transmission connector and transmission body.

Connector & terminal


(T4) No. 3 — Transmission body:

Is the resistance approximately 13 — 18.5 Ω ? (when cold)

Yes

Check for poor contact of connector, and if no fault is found, replace the TCM.
 [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

No

 [Go to 4.](#)

4. CHECK HARNESS INSIDE TRANSMISSION.



Caution:

Start work after ATF cools down.

1. Remove the transmission oil pan.
2. Check for the harness pinch, damage.

Is there any fault in the harness?

Yes

Replace the transmission harness.

No

 [Go to 5.](#)

5. CHECK HARNESS INSIDE TRANSMISSION.



1. Disconnect the control valve body connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between transmission connector and transmission body.

Connector & terminal

(T4) No. 3 (+) — Transmission body (-):

Is the voltage approx. 0 V?

Yes

Replace the control valve body.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Control Valve Body.](#)

No

Replace the transmission harness.

1. OUTLINE OF DIAGNOSIS

- Detect open circuit or short circuit to ground in the lock-up clutch ON/OFF solenoid drive circuit.
- Judge as NG when an abnormal signal is received from the solenoid driver IC of the lock-up clutch ON/OFF solenoid drive circuit.

2. EXECUTION CONDITION

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 9 V
Torque converter clutch circuit control solenoid output command	OFF

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal of malfunction from solenoid driver IC	ON
As defined by: Measured torque converter clutch circuit control solenoid voltage ≥ 2.5 V	


Time needed for diagnosis: 0.2 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure has occurred.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Measured turbine shaft speed	> 0 rpm
or	
Transmission range	Drive or Reverse

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN bus condition	Bus off

Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure has occurred.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Measured primary pulley shaft speed	> 0 rpm
or	
Transmission range	Drive or Reverse

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

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Malfunction Criteria	Threshold Value
CAN bus condition	Bus off


Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure occurs with the ECM.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Measured turbine shaft speed	> 0 rpm
or	
Transmission range	Drive or Reverse

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from ECM	Lost

Time needed for diagnosis: 0.5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure occurs with the ECM.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Measured primary pulley shaft speed	> 0 rpm
or	
Transmission range	Drive or Reverse

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

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Malfunction Criteria	Threshold Value
CAN data from ECM	Lost


Time needed for diagnosis: 0.5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure occurs with the VDC CM.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Measured turbine shaft speed	> 0 rpm
or	
Transmission range	Drive or Reverse

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from Vehicle Dynamics Control Module	Lost

Time needed for diagnosis: 0.5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure occurs with the VDC CM.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Measured primary pulley shaft speed	> 0 rpm
or	
Transmission range	Drive or Reverse

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from Vehicle Dynamics Control Module	Lost


Time needed for diagnosis: 0.5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure occurs with the body integrated unit.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
Measured turbine shaft speed	> 0 rpm
or	
D range switch	ON

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from BIU	Lost

Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Does not illuminate.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure occurs with the body integrated unit.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
Measured primary shaft speed	> 0 rpm
or	
D range switch	ON

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from BIU	Lost


Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure occurs with the combination meter.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
Measured turbine shaft speed	> 0 rpm
or	
D range switch	ON

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from combination meter	Lost

Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Does not illuminate.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure occurs with the combination meter.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
Measured primary shaft speed	> 0 rpm
or	
D range switch	ON

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
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CAN data from combination meter	Lost
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Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0164 LOST COMMUNICATION WITH HVAC CONTROL MODULE

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure occurs with the A/C control panel.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
Measured turbine shaft speed	> 0 rpm
or	
D range switch	ON

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from A/C control panel	Lost

Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Does not illuminate.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure occurs with the A/C control panel.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
Measured primary shaft speed	> 0 rpm
or	
D range switch	ON

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from A/C control panel	Lost


Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when data received from ECM is not normal.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Measured turbine shaft speed	> 0 rpm
or	
Transmission range	Drive or Reverse

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from ECM	Did not change

Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when data received from ECM is not normal.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Measured primary pulley shaft speed	> 0 rpm
or	
Transmission range	Drive or Reverse

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

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Malfunction Criteria	Threshold Value
CAN data from ECM	Did not change


Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when data received from VDC CM is not normal.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Measured turbine shaft speed	> 0 rpm
or	
Transmission range	Drive or Reverse

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from Vehicle Dynamics Control Module	Did not change

Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when data received from VDC CM is not normal.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
12 V battery system voltage	≥ 10 V
Measured primary pulley shaft speed	> 0 rpm
or	
Transmission range	Drive or Reverse

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

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Malfunction Criteria	Threshold Value
CAN data from Vehicle Dynamics Control Module	Did not change


Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when data received from the body integrated unit is not normal.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
Measured turbine shaft speed	> 0 rpm
or	
D range switch	ON

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from BIU	Freeze

Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Does not illuminate.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when data received from the body integrated unit is not normal.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
Measured primary shaft speed	> 0 rpm
or	
D range switch	ON

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from BIU	Freeze


Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when data received from the combination meter is not normal.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
Measured turbine shaft speed	> 0 rpm
or	
D range switch	ON

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from combination meter	Freeze

Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Does not illuminate.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when data received from the combination meter is not normal.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
Measured primary shaft speed	> 0 rpm
or	
D range switch	ON

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
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CAN data from combination meter

Freeze


Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0424 INVALID DATA RECEIVED FROM HVAC CONTROL MODULE

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when data received from the A/C control panel is not normal.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
Measured turbine shaft speed	> 0 rpm
or	
D range switch	ON

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from A/C control panel	Freeze

Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Does not illuminate.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when data received from the A/C control panel is not normal.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
Measured primary shaft speed	> 0 rpm
or	
D range switch	ON

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from A/C control panel	Freeze


Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1235 LOST COMMUNICATION WITH EYESIGHT

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure occurs with the stereo camera.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
Measured turbine shaft speed	> 0 rpm
or	
D range switch	ON

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from stereo camera	Lost

Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Does not illuminate.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure occurs with the stereo camera.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
Measured primary shaft speed	> 0 rpm
or	
D range switch	ON

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from stereo camera	Lost


Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1433 INVALID DATA RECEIVED FROM EYESIGHT

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure.  [Ref. to LAN SYSTEM \(DIAGNOSTICS\)>Basic Diagnostic Procedure.](#)

1. OUTLINE OF DIAGNOSIS (NON-TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when data received from the stereo camera is not normal.

2. EXECUTION CONDITION (NON-TURBO MODEL)

Secondary Parameters	Execution condition
Measured turbine shaft speed	> 0 rpm
or	
D range switch	ON

3. DIAGNOSTIC METHOD (NON-TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from stereo camera	Freeze

Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Does not illuminate.

4. OUTLINE OF DIAGNOSIS (TURBO MODEL)

- Detect malfunction of CAN communication.
- Judge as NG when data received from the stereo camera is not normal.

5. EXECUTION CONDITION (TURBO MODEL)

Secondary Parameters	Execution condition
Measured primary shaft speed	> 0 rpm
or	
D range switch	ON

6. DIAGNOSTIC METHOD (TURBO MODEL)

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from stereo camera	Freeze

Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure without Diagnostic Trouble Code (DTC)

CHECK SHIFT INDICATOR

Diagnosis:

- CAN communication is abnormal with the combination meter.
- Combination meter malfunction

Trouble symptom:

- Shift indicator does not display or remains displayed.
- Shift indicator display does not change.

1. CHECK TCM.


Check the DTC relating the TCM using the Subaru Select Monitor.

Is DTC U0423 or U0155 displayed?

Yes

Perform the self-diagnosis of combination meter.

No

 [Go to 2.](#)

2. CHECK TCM.


Check the DTC relating the TCM using the Subaru Select Monitor.

Are DTCs other than U0155 and U0423 displayed?

Yes

Perform the diagnosis according to DTC.

No

 [Go to 3.](#)

3. CHECK COMBINATION METER.

Check the DTC of combination meter.

Are any DTCs displayed?

Yes

Perform the diagnosis according to DTC.

No

 [Go to 4.](#)

4. CHECK TCM.



1. Operate the + side of the paddle shift switch.
2. Read the data of [Up Switch] using Subaru Select Monitor.

Does it change between ON and OFF according to the operation?

Yes

 [Go to 5.](#)

No

Check for poor contact between TCM and paddle shift UP switch, and repair the defective part.

5. CHECK TCM.



1. Operate the – side of the paddle shift switch.
2. Read the data of [Down Switch] using Subaru Select Monitor.

Does it change between ON and OFF according to the operation?

Yes

 [Go to 6.](#)

No

Check for poor contact between TCM and paddle shift down switch, and repair the defective part.


6. CHECK TCM.




1. Turn the ignition switch OFF, then turn it ON again.
2. Shift the select lever to manual mode.
3. Read the data of [Shift step in Manu. mode] using Subaru Select Monitor.

Is "1" displayed?

Yes

 [Go to 7.](#)

No

Perform the diagnosis according to DTC P0951.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Diagnostic Procedure with Diagnostic Trouble Code \(DTC\)>DTC P0951 AUTO SHIFT MANUAL CONTROL CIRCUIT RANGE/PERFORMANCE.](#)

7. CHECK TCM.





1. Shift up the select lever.
2. Read the data of [Shift step in Manu. mode] using Subaru Select Monitor.

Is "2" displayed?

Yes

Current condition is normal.

No

Replace the TCM.  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Transmission Control Module \(TCM\).](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Transmission Control Module \(TCM\).](#)

TRANSMISSION (DIAGNOSTICS) > Diagnostics with Phenomenon

INSPECTION


Symptoms	Faulty parts
Engine stalls when driving in "D" or "R" range, or selecting "N" → "D", "N" → "R".	<ul style="list-style-type: none"> Control valve Engine control system
While driving in "D" range, vibration occurs immediately before the stop or engine stalls.	<ul style="list-style-type: none"> Control valve Torque converter
Vehicle cannot shift while driving in "D" range.	<ul style="list-style-type: none"> Control valve TCM Shift mechanism Power supply system
Excessive shock when selecting "N" → "D", and "N" → "R".	<ul style="list-style-type: none"> Control valve TCM F&R clutch pack ATF deterioration or lack
Excessive shock at standing start in "D" range.	<ul style="list-style-type: none"> Control valve TCM F&R clutch pack ATF deterioration or lack
Engine speed increases abruptly during driving in "D" or "R" range.	<ul style="list-style-type: none"> Control valve Secondary pressure sensor F&R clutch pack ATF deterioration or lack
Vehicle can not start when depressing the accelerator pedal in "D" or "R" range, or acceleration is very poor. (without abrupt engine increase)	<ul style="list-style-type: none"> Control valve F&R clutch pack Shift mechanism Parking mechanism Engine control system Power supply system
Shift indicator in combination meter displays the position which differs from select lever position.	<ul style="list-style-type: none"> Inhibitor switch Select cable related Combination meter
Manual mode enters even though the select lever and paddle shift switch is not operated.	<ul style="list-style-type: none"> Manual mode switch Paddle shift switch Select lever TCM
Engine speed increases abruptly in "D" or "R" range, vehicle can not start.	<ul style="list-style-type: none"> F&R clutch pack Select cable related
Manual mode can not be set	<ul style="list-style-type: none"> Select lever TCM

TRANSMISSION (DIAGNOSTICS) > Drive Cycle

PROCEDURE

It is possible to complete diagnosis of the DTC by performing the indicated drive cycle. After the repair for the DTC, perform a necessary drive cycle and make sure the function recovers and the DTC is recorded.

1. PREPARATION FOR DRIVE CYCLE

1. Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 L (5.3 — 10.6 US gal, 4.4 — 8.8 Imp gal)].
2. After performing the diagnostics and clearing memory, check that no DTC remains.  [Ref. to TRANSMISSION \(DIAGNOSTICS\)>Clear memory.](#)

Note:

Perform the drive cycle after warming up the engine except when the ATF temperature at engine start is specified.

2. DRIVE CYCLE A

DTC	Item	Condition
P0601	INTERNAL CONTROL MODULE MEMORY CHECKSUM ERROR	Perform the drive cycle A twice.
P0604	INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR	Perform the drive cycle A twice.
P062F	INTERNAL CONTROL MODULE EEPROM ERROR	Perform the drive cycle A twice.
P0712	TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT LOW	—
P0842	TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT LOW	—
P0843	TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT HIGH	—
P0890	TCM POWER RELAY SENSE CIRCUIT LOW	—
P0962	PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT LOW	—
P0963	PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT HIGH	—
P0966	PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT LOW	—
P0967	PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT HIGH	—
P160A	RANDOM ACCESS MEMORY (RAM) ERROR	Perform the drive cycle A twice.
P2530	IGNITION SWITCH RUN POSITION CIRCUIT	—
P2763	TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT HIGH	Perform the drive cycle A, then perform the drive cycle C.

Diagnostic procedure:

1. Start the engine.

- Depress the brake pedal and move the select lever to each range at an interval of five seconds.

Note:

Move the select lever in the following order: "P" → "R" → "N" → "D" → "N" → "R" → "P".

3. DRIVE CYCLE B

DTC	Item	Condition
P0711	TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT RANGE/PERFORMANCE	—

Diagnostic procedure:

- Start the engine under condition that ATF temperature is at 20°C (68°F) or below.
- Drive in any driving pattern for 20 minutes. (Include driving at a constant legal speed (for 20 seconds) at least once.)

Note:

Repeat two or more driving cycles in this driving pattern.

4. DRIVE CYCLE C

DTC	Item	Condition
P0500	VEHICLE SPEED SENSOR "A" CIRCUIT	—
P0716	INPUT/TURBINE SHAFT SPEED SENSOR "A" CIRCUIT RANGE/PERFORMANCE	—
P0717	INPUT/TURBINE SHAFT SPEED SENSOR "A" CIRCUIT NO SIGNAL	—
P0720	OUTPUT SHAFT SPEED SENSOR CIRCUIT	—
P0721	OUTPUT SHAFT SPEED SENSOR CIRCUIT RANGE/PERFORMANCE	—
P0970	PRESSURE CONTROL SOLENOID "C" CONTROL CIRCUIT LOW	—
P0971	PRESSURE CONTROL SOLENOID "C" CONTROL CIRCUIT HIGH	—
P0973	SHIFT SOLENOID "A" CONTROL CIRCUIT LOW	—
P0974	SHIFT SOLENOID "A" CONTROL CIRCUIT HIGH	—
P0976	SHIFT SOLENOID "B" CONTROL CIRCUIT LOW	—
P0977	SHIFT SOLENOID "B" CONTROL CIRCUIT HIGH	—
P2746	INTERMEDIATE SHAFT SPEED SENSOR "B" CIRCUIT RANGE/PERFORMANCE	—
P2747	INTERMEDIATE SHAFT SPEED SENSOR "B" CIRCUIT NO SIGNAL	—
P2750	INTERMEDIATE SHAFT SPEED SENSOR "C" CIRCUIT RANGE/PERFORMANCE	—
P2751	INTERMEDIATE SHAFT SPEED SENSOR "C" CIRCUIT NO SIGNAL	—
P2763	TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT HIGH	Perform the drive cycle A, then perform the drive cycle C.

P2764	TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT LOW	—
P2769	TORQUE CONVERTER CLUTCH CIRCUIT LOW	—
P2770	TORQUE CONVERTER CLUTCH CIRCUIT HIGH	—

Diagnostic procedure:

1. Start the engine.
2. Accelerate slowly to a legal speed, and then decelerate slowly to a stop.

5. DRIVE CYCLE D

DTC	Item	Condition
P0713	TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT HIGH	—
P0730	INCORRECT GEAR RATIO	—
P0746	PRESSURE CONTROL SOLENOID "A" PERFORMANCE/STUCK OFF	Perform the drive cycle D twice.
P0747	PRESSURE CONTROL SOLENOID "A" STUCK ON	Perform the drive cycle D twice.
P0751	SHIFT SOLENOID "A" PERFORMANCE/STUCK OFF	Perform the drive cycle D twice.
P0752	SHIFT SOLENOID "A" STUCK ON	Perform the drive cycle D twice.
P0756	SHIFT SOLENOID "B" PERFORMANCE/STUCK OFF	Perform the drive cycle D twice.
P0757	SHIFT SOLENOID "B" STUCK ON	Perform the drive cycle D twice.
P0776	PRESSURE CONTROL SOLENOID "B" PERFORMANCE/STUCK OFF	Perform the drive cycle D twice.
P0841	TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT RANGE/PERFORMANCE	—
P0961	PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT RANGE/PERFORMANCE	—
P0965	PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT RANGE/PERFORMANCE	—
P2757	TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT PERFORMANCE/STUCK OFF	Perform the drive cycle D twice.
P2758	TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT STUCK ON	Perform the drive cycle D twice.

Diagnostic procedure:

1. Start the engine.
2. Drive in any driving pattern for 20 minutes. (Include driving at a constant legal speed (for 20 seconds) at least once.)

6. DRIVE CYCLE E

DTC	Item	Condition
P0801	REVERSE INHIBIT CONTROL CIRCUIT/OPEN	—
U0073	CAN FAILURE, BUS 'OFF' DETECTION	—
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	—
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	—
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	—
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	—
U0164	LOST COMMUNICATION WITH HVAC CONTROL MODULE	—
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	—
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	—
U0422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE	—
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	—
U0424	INVALID DATA RECEIVED FROM HVAC CONTROL MODULE	—
U1235	LOST COMMUNICATION WITH EyeSight	—
U1433	INVALID DATA RECEIVED FROM EyeSight	—

Diagnostic procedure:

1. Start the engine.

7. DRIVE CYCLE F

DTC	Item	Condition
P0705	TRANSMISSION RANGE SENSOR "A" CIRCUIT (PRNDL INPUT)	—

Diagnostic procedure:

1. Start the engine.
2. Depress the brake pedal and move the select lever to each range at an interval of five seconds.

Note:

Move the select lever in the following order: "P" → "R" → "N" → "D".

3. Maintain the engine speed at 2000 rpm for five seconds or more.

8. DRIVE CYCLE G

DTC	Item	Condition
P0708	TRANSMISSION RANGE SENSOR "A" CIRCUIT HIGH	—

Diagnostic procedure:

1. Start the engine.
2. Drive for three seconds at 16 km/h (10 MPH).

Note:

Drive in "D" range and "R" range.

9. DRIVE CYCLE H

DTC	Item	Condition
P0719	BRAKE SWITCH "B" CIRCUIT LOW	—
P0724	BRAKE SWITCH "B" CIRCUIT HIGH	—
P0951	AUTO SHIFT MANUAL CONTROL CIRCUIT RANGE/PERFORMANCE	—
P170A	L-RANGE SWITCH	—

Diagnostic procedure:

- 1.** Start the engine.
- 2.** Operate the stop light switch or the manual mode switch.

Note:

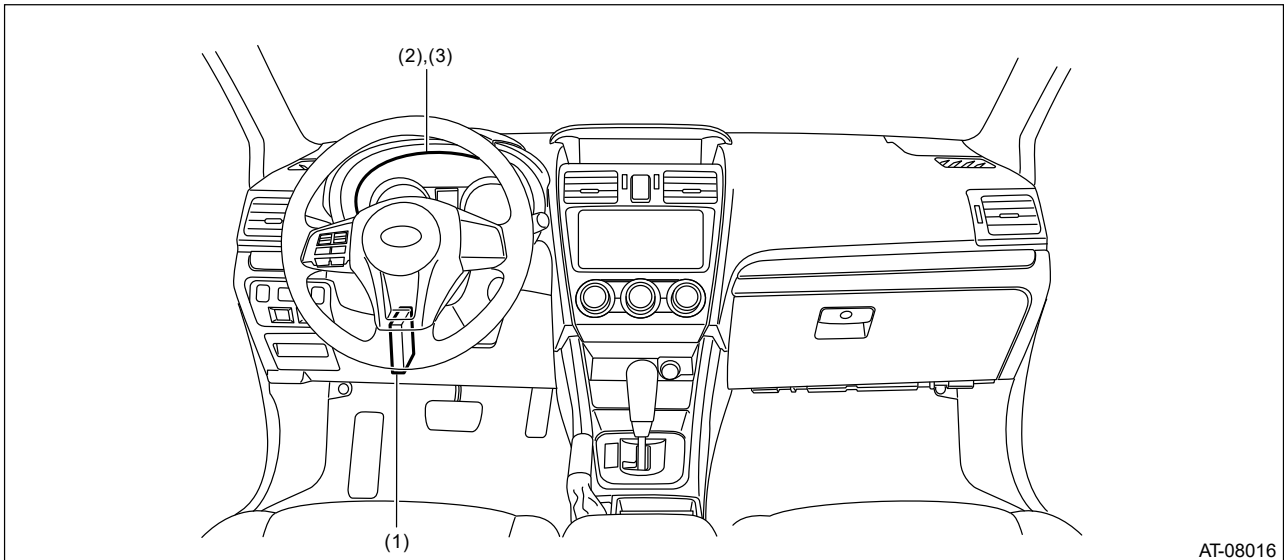
Drive in "D" range and "R" range.

- 3.** Read the data of the stop light switch or the manual mode switch using the Subaru Select Monitor. Or measure the terminal voltage.

TRANSMISSION (DIAGNOSTICS) > Electrical Component Location

LOCATION

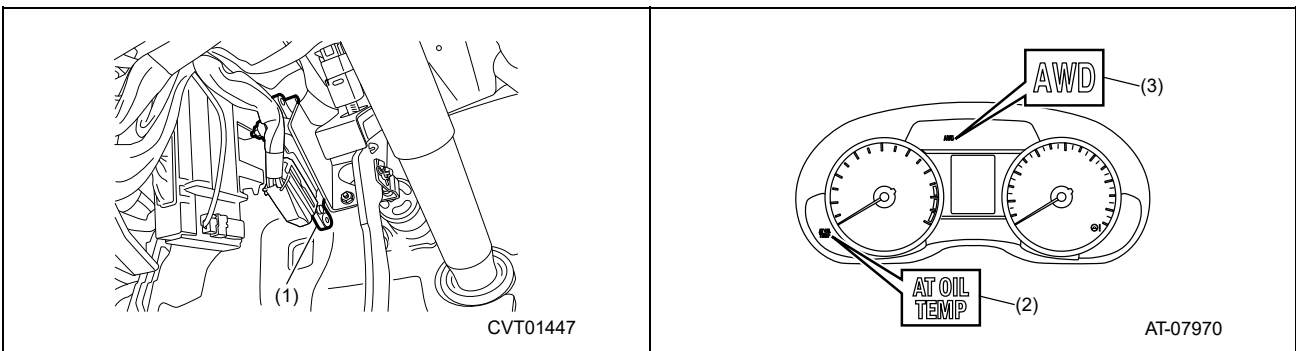
1. CONTROL MODULE



(1) Transmission control module (TCM)

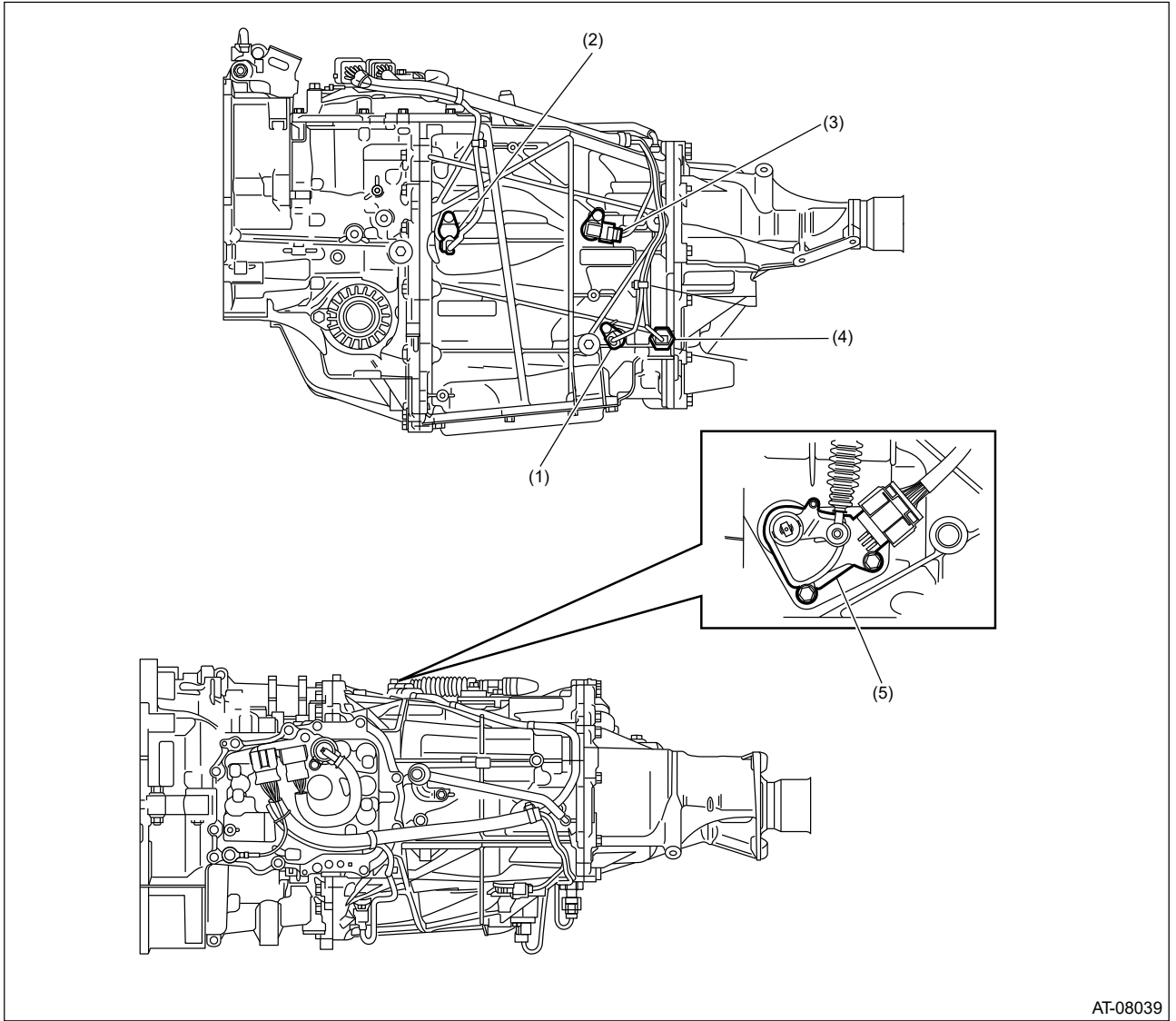
(2) AT OIL TEMP light

(3) AWD light



2. SENSOR

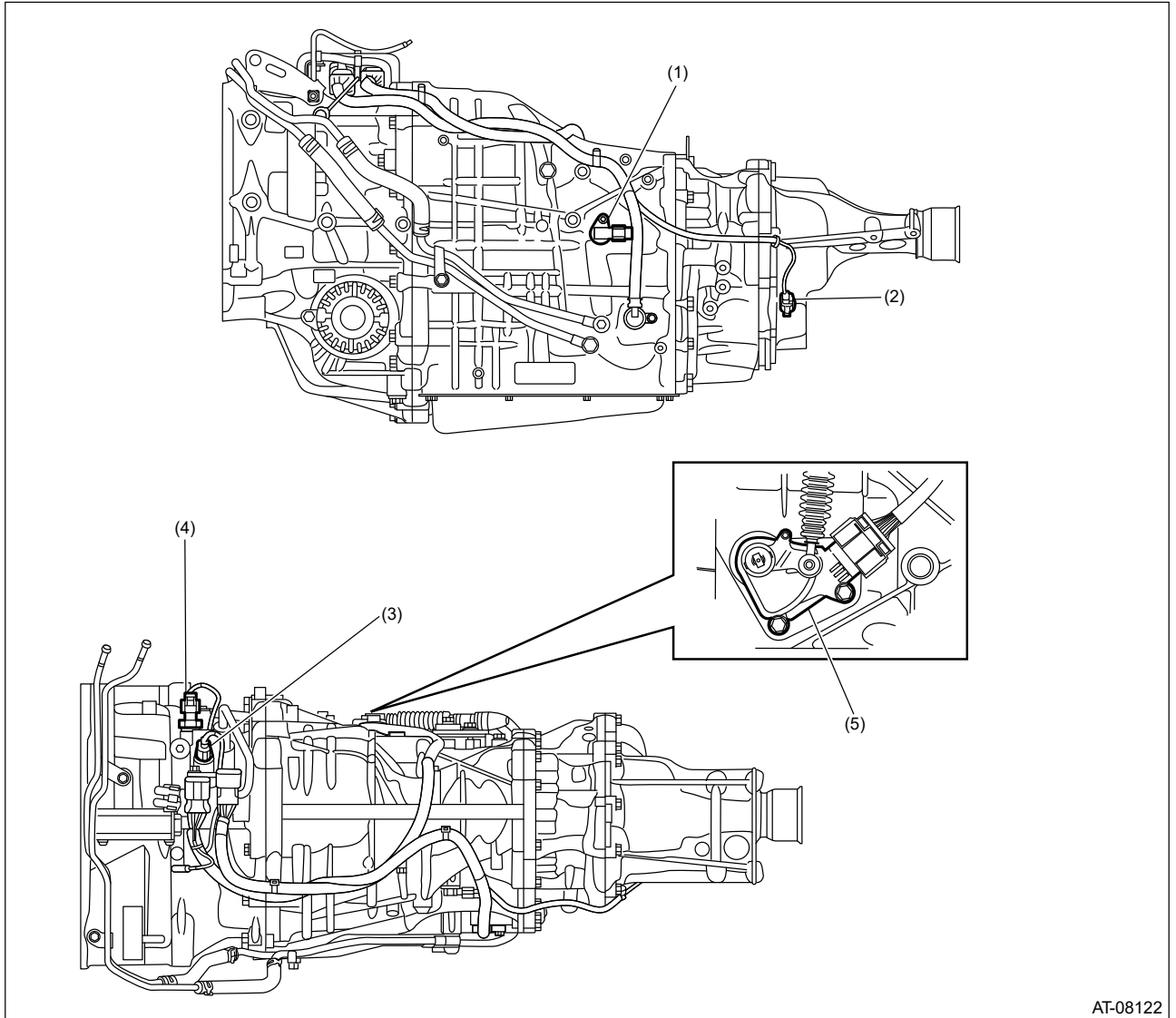
- Non-turbo model



AT-08039

- (1) Secondary speed sensor
- (2) Turbine speed sensor
- (3) Primary speed sensor
- (4) Secondary pressure sensor
- (5) Inhibitor switch

- Turbo model

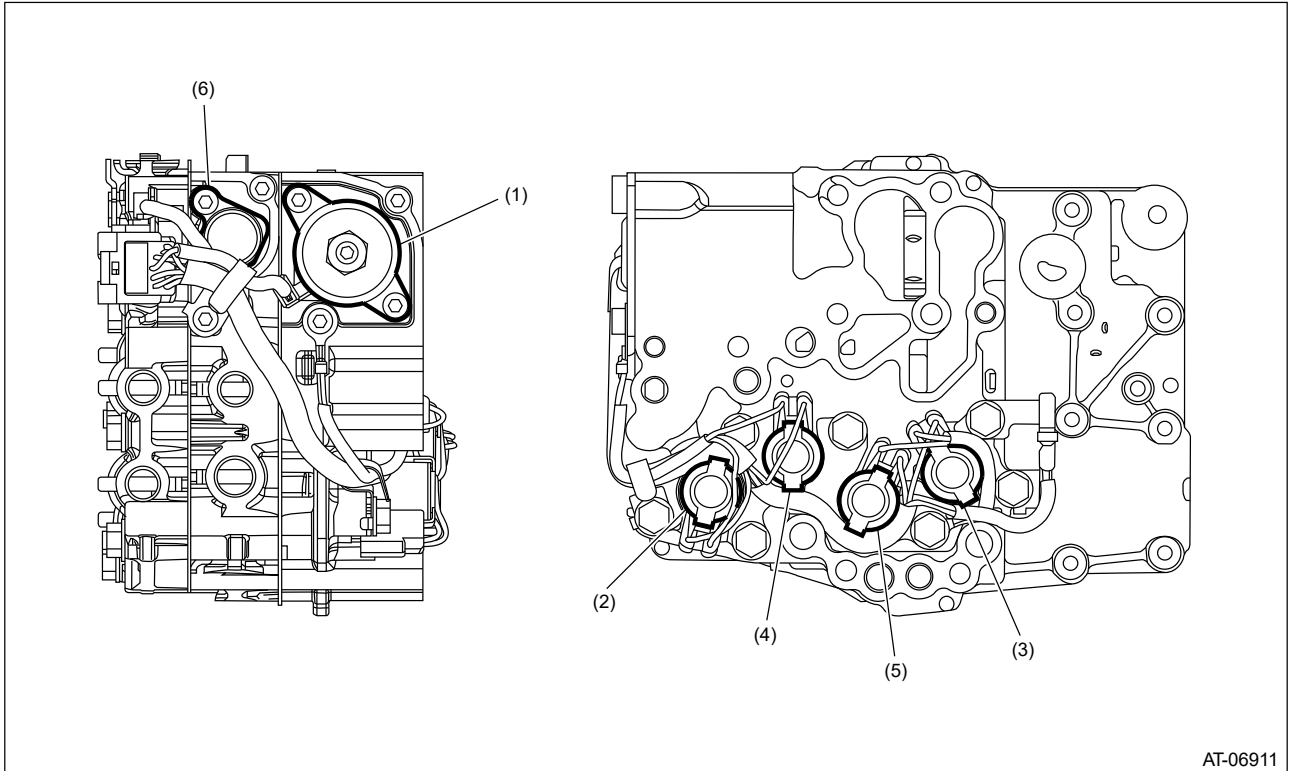


AT-08122

- | | | |
|------------------------------|-------------------------------|----------------------|
| (1) Secondary speed sensor | (3) Primary speed sensor | (5) Inhibitor switch |
| (2) Front wheel speed sensor | (4) Secondary pressure sensor | |

3. SOLENOID

- Non-turbo model



AT-06911

(1) Secondary solenoid

(2) AWD solenoid

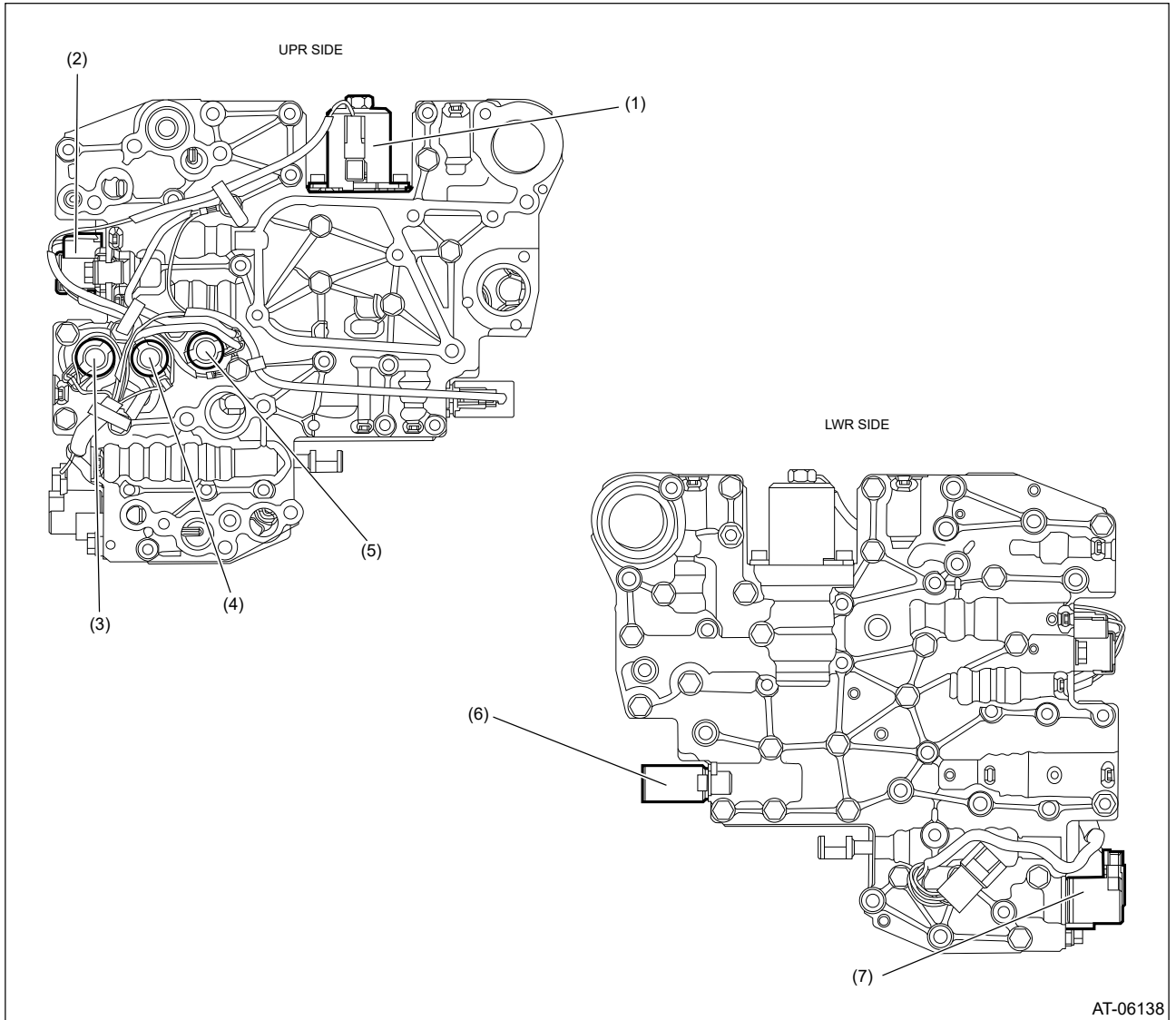
(3) Lock-up duty solenoid

(4) Primary DOWN solenoid

(5) Primary UP solenoid

(6) F&R solenoid

- Turbo model



AT-06138

- (1) Secondary solenoid
- (2) AWD solenoid
- (3) Lock-up duty solenoid

- (4) Primary DOWN solenoid
- (5) Primary UP solenoid

- (6) F&R solenoid
- (7) Lock-up ON/OFF solenoid

TRANSMISSION (DIAGNOSTICS) > General Description

CAUTION

1. The airbag system wiring harness is routed near the TCM.

Caution:

- **All the airbag system wiring harnesses and connectors are colored yellow. Do not use an electric test equipment to check these circuits.**
- **Be careful not to damage the airbag system wiring harness when performing diagnostics or servicing the TCM.**

2. When measuring the voltage or resistance of individual sensors or all electrical control modules, use a tapered pin with a diameter of 0.6 mm (0.024 in) or less and touch it to the tip of terminal. Never insert the tapered pin into the terminal because it deforms inside which may lead to malfunction.

Caution:

If the tapered pin (or similar) was inserted in the connector terminal, replace the connector.



3. The TCM connector is waterproof. When measuring the TCM connector terminal voltage, or the resistance between the terminals, use the ST.

ST 18460AA040 CHECK BOARD

TRANSMISSION (DIAGNOSTICS) > General Description

INSPECTION

1. BATTERY

Check the battery.  [Ref. to STARTING/CHARGING SYSTEMS\(H4DOTC\)>General Description.](#)
 [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Battery>INSPECTION.](#)

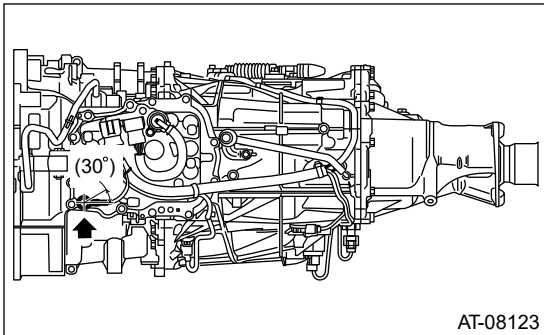
2. TRANSMISSION GROUND

Make sure that the ground terminal bolt is tightened securely.

Tightening torque:

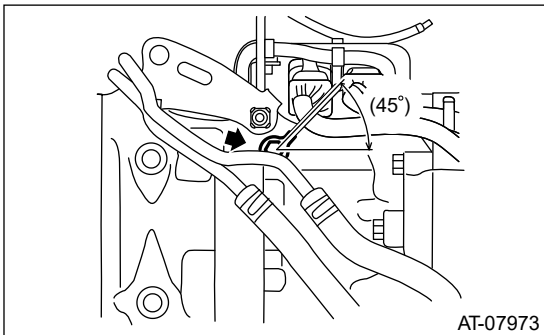
Non-turbo model

14 N·m (1.4 kgf-m, 10.3 ft-lb)



Turbo model

16 N·m (1.6 kgf-m, 11.8 ft-lb)



3. OPERATION OF SELECT LEVER

Make sure there is no noise, dragging or contact pattern in each select lever range.


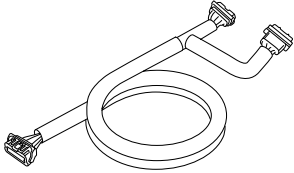
Warning:

Stop the engine while checking operation of the select lever.

TRANSMISSION (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL



ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>STSSM4</p>	<p>— (Newly adopted tool)</p>	<p>SUBARU SELECT MONITOR 4</p>	<p>Used for setting of each function and troubleshooting for electrical system.</p> <p>Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".</p>
 <p>ST18460AA040</p>	<p>18460AA040</p>	<p>CHECK BOARD</p>	<p>Used for measuring voltage and resistance of TCM terminals.</p>

2. GENERAL TOOL

TOOL NAME	REMARKS
<p>Circuit tester</p>	<p>Used for measuring resistance, voltage and current.</p>
<p>Oscilloscope</p>	<p>Used for measuring the sensor.</p>
<p>DST-i</p>	<p>Used together with Subaru Select Monitor 4.</p>

TRANSMISSION (DIAGNOSTICS) > Inspection Mode

PROCEDURE

 [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR580\)>Road Test.](#)  [Ref. to CONTINUOUSLY VARIABLE TRANSMISSION\(TR690\)>Road Test.](#)

TRANSMISSION (DIAGNOSTICS) > Learning Control

GENERAL DESCRIPTION

- Follow the messages displayed on the Subaru Select Monitor when working.
- When the following work is performed, perform learning work for the transmission.
Replacement of TCM/Replacement or disassembly of transmission assembly/Replacement of control valve body/Clearing AT leaning value is executed.

PROCEDURE

1. PREPARATION FOR LEARNING

1. Warm up or cool down until the ATF temperature displayed on the Subaru Select Monitor is 40 — 65°C (104 — 149°F).
2. After stopping the vehicle, shift the select lever to "P" range.
3. Fully apply the parking brake.
4. Lift up the vehicle.

Caution:

While working, be sure to keep the lower edge of the tires 30 cm or more above the ground as vehicle will vibrate.

5. Connect the Subaru Select Monitor to data link connector.
6. Turn the ignition switch to ON.
7. Turn off all switches causing an electrical load, such as headlights, A/C, seat heater and rear defogger, etc.
8. Set SI-DRIVE to I mode. (Vehicles with SI-DRIVE)

2. SIMPLE LEARNING

Note:

Simple learning is performed with the vehicle lifted, without actually running the vehicle.

Caution:

Do not turn the power of the Subaru Select Monitor OFF during work, and do not disconnect the data link connector.

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Transmission].
5. On [Select Function] display, select Work Support.
6. On [Work Support] display, select [AT learning mode].
7. Follow the messages displayed on the screen when working.

Note:

During AT learning in progress, AT OIL TEMP light in the combination meter starts flashing at 2 Hz and the learning operation starts. When the AT OIL TEMP light which was flashing at 2 Hz goes off, the following message is displayed on the display.

8. When AT learning normally ended. is displayed, simple AT learning is completed.

Note:

- **If communication error occurs during learning, retry the "AT learning mode" from the beginning.**
- **If the message Execute AT learning again after fixing troubles of the vehicle appears during learning, select OK and display the DTC list. After repairing the locations indicated by the DTC, start the "AT learning mode" over from the beginning.**
- **When communication error occurs during learning, select lever does not shift occasionally. If select lever does not shift, turn the ignition switch to OFF before operating the select lever.**
- **If the message [AT learning ended abnormally. Try again from the beginning.] is displayed, start the "AT learning mode" over from the beginning.**








Message	Main causes for abnormal termination
[AT learning ended abnormally. Try again from the beginning.]	<ul style="list-style-type: none"> • A malfunction was detected during AT learning








- The accelerator pedal was pressed during AT learning
- An unspecified operation was performed during AT learning
- ATF temperature became out of allowable range during AT learning.
- Battery voltage is low.
- The malfunction indicator light is lit.
- Parking brake not applied strongly enough.
- Brake pedal is not depressed fully.
- Abnormal idle speed increase, etc.










- **For detailed operation procedures, refer to “Application help”.**








TRANSMISSION (DIAGNOSTICS) > List of Diagnostic Trouble Code (DTC)









LIST









DTC	Item	Content of diagnosis	Reference
P0500	VEHICLE SPEED SENSOR "A" CIRCUIT	Wheel speed data from VDC CM&H/U is abnormal.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0500 VEHICLE SPEED SENSOR "A" CIRCUIT.
P0601	INTERNAL CONTROL MODULE MEMORY CHECKSUM ERROR	TCM ROM malfunction	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0601 INTERNAL CONTROL MODULE MEMORY CHECKSUM ERROR.
P0604	INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR	TCM RAM malfunction	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR.
P062F	INTERNAL CONTROL MODULE EEPROM ERROR	TCM EEPROM malfunction	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P062F INTERNAL CONTROL MODULE EEPROM ERROR.
P0705	TRANSMISSION RANGE SENSOR "A" CIRCUIT (PRNDL INPUT)	Inhibitor switch malfunction short circuit	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0705 TRANSMISSION RANGE SENSOR "A" CIRCUIT (PRNDL INPUT).
P0708	TRANSMISSION RANGE SENSOR "A" CIRCUIT HIGH	Inhibitor switch is faulty or circuit is open.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0708 TRANSMISSION RANGE SENSOR "A" CIRCUIT HIGH.
P0711	TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT	ATF temperature sensor is faulty or input signal circuit is faulty.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0711 TRANSMISSION FLUID







	RANGE/PERFORMANCE		TEMPERATURE SENSOR "A" CIRCUIT RANGE/PERFORMANCE.
P0712	TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT LOW	ATF temperature sensor is faulty or input signal circuit is shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0712 TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT LOW.
P0713	TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT HIGH	ATF temperature sensor is faulty or input signal circuit is open or shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0713 TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT HIGH.
P0716	INPUT/TURBINE SHAFT SPEED SENSOR "A" CIRCUIT RANGE/PERFORMANCE	Turbine speed sensor is faulty or input signal circuit is open or shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0716 INPUT/TURBINE SHAFT SPEED SENSOR "A" CIRCUIT RANGE/PERFORMANCE.
P0717	INPUT/TURBINE SHAFT SPEED SENSOR "A" CIRCUIT NO SIGNAL	Turbine speed sensor signal no input	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0717 INPUT/TURBINE SHAFT SPEED SENSOR "A" CIRCUIT NO SIGNAL.
P0719	BRAKE SWITCH "B" CIRCUIT LOW	Brake switch is faulty, or input signal circuit is open or shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0719 BRAKE SWITCH "B" CIRCUIT LOW.
P0720	OUTPUT SHAFT SPEED SENSOR CIRCUIT	Front wheel sensor is faulty, or input signal circuit is open or shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0720 OUTPUT SHAFT SPEED SENSOR CIRCUIT.
P0721	OUTPUT SHAFT SPEED SENSOR CIRCUIT RANGE/PERFORMANCE	Front wheel speed sensor characteristics is abnormal.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0721 OUTPUT SHAFT SPEED SENSOR CIRCUIT RANGE/PERFORMANCE.









P0724	BRAKE SWITCH "B" CIRCUIT HIGH	Brake switch malfunction, shorted input signal circuit	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0724 BRAKE SWITCH "B" CIRCUIT HIGH.
P0730	INCORRECT GEAR RATIO	Primary speed sensor, secondary speed sensor, control valve, or chain is faulty.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0730 INCORRECT GEAR RATIO.
P0746	PRESSURE CONTROL SOLENOID "A" PERFORMANCE/STUCK OFF	Secondary solenoid is faulty, hydraulic circuit is stuck in low pressure side.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0746 PRESSURE CONTROL SOLENOID "A" PERFORMANCE/STUCK OFF.
P0747	PRESSURE CONTROL SOLENOID "A" STUCK ON	Secondary solenoid is faulty, hydraulic circuit is stuck in high pressure side.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0747 PRESSURE CONTROL SOLENOID "A" STUCK ON.
P0751	SHIFT SOLENOID "A" PERFORMANCE/STUCK OFF	Primary UP solenoid is faulty, hydraulic circuit is stuck in low pressure side.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0751 SHIFT SOLENOID "A" PERFORMANCE/STUCK OFF.
P0752	SHIFT SOLENOID "A" STUCK ON	Primary UP solenoid is faulty, hydraulic circuit is stuck in high pressure side.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0752 SHIFT SOLENOID "A" STUCK ON.
P0756	SHIFT SOLENOID "B" PERFORMANCE/STUCK OFF	Primary DOWN solenoid is faulty, hydraulic circuit is stuck in low pressure side.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0756 SHIFT SOLENOID "B" PERFORMANCE/STUCK OFF.
P0757	SHIFT SOLENOID "B" STUCK ON	Primary DOWN solenoid is faulty, hydraulic circuit is stuck in high pressure side.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0757 SHIFT SOLENOID "B" STUCK ON.
P0776	PRESSURE CONTROL	F&R solenoid is faulty, hydraulic circuit is stuck in	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic








	SOLENOID "B" PERFORMANCE/STUCK OFF	low pressure side.	Procedure with Diagnostic Trouble Code (DTC)>DTC P0776 PRESSURE CONTROL SOLENOID "B" PERFORMANCE/STUCK OFF.
P0801	REVERSE INHIBIT CONTROL CIRCUIT/OPEN	Shift lock solenoid is faulty or output signal circuit is open or shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0801 REVERSE INHIBIT CONTROL CIRCUIT/OPEN.
P0841	TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT RANGE/PERFORMANCE	Secondary pressure sensor or control valve is faulty	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0841 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT RANGE/PERFORMANCE.
P0842	TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT LOW	Secondary pressure sensor is faulty or input signal circuit is open or shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0842 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT LOW.
P0843	TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT HIGH	Secondary pressure sensor is faulty or input signal circuit is shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0843 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT HIGH.
P0890	TCM POWER RELAY SENSE CIRCUIT LOW	Self-shut relay is faulty, or input signal circuit is open or shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0890 TCM POWER RELAY SENSE CIRCUIT LOW.
P0951	AUTO SHIFT MANUAL CONTROL CIRCUIT RANGE/PERFORMANCE	Manual mode switch is faulty, or input signal circuit is open or shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0951 AUTO SHIFT MANUAL CONTROL CIRCUIT RANGE/PERFORMANCE.
P0961	PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT RANGE/PERFORMANCE	Characteristics of secondary solenoid is abnormal.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0961 PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT RANGE/PERFORMANCE.

P0962	PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT LOW	Secondary solenoid is faulty or output signal circuit is shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0962 PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT LOW.
P0963	PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT HIGH	Secondary solenoid is faulty or output signal circuit is open or shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0963 PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT HIGH.
P0965	PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT RANGE/PERFORMANCE	Forward & reverse solenoid is faulty, forward clutch is faulty, or control valve is faulty.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0965 PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT RANGE/PERFORMANCE.
P0966	PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT LOW	Forward & reserve solenoid is faulty, or output signal circuit is shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0966 PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT LOW.
P0967	PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT HIGH	Forward & reserve solenoid is faulty, or output signal circuit is open or shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0967 PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT HIGH.
P0970	PRESSURE CONTROL SOLENOID "C" CONTROL CIRCUIT LOW	AWD solenoid is faulty, or output signal circuit is shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0970 PRESSURE CONTROL SOLENOID "C" CONTROL CIRCUIT LOW.
P0971	PRESSURE CONTROL SOLENOID "C" CONTROL CIRCUIT HIGH	AWD solenoid is faulty, or output signal circuit is open or shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0971 PRESSURE CONTROL SOLENOID "C" CONTROL CIRCUIT HIGH.
P0973	SHIFT SOLENOID "A" CONTROL CIRCUIT LOW	Primary UP solenoid is faulty or output signal circuit is shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble

			Code (DTC)>DTC P0973 SHIFT SOLENOID "A" CONTROL CIRCUIT LOW.
P0974	SHIFT SOLENOID "A" CONTROL CIRCUIT HIGH	Primary UP solenoid is faulty or output signal circuit is open or shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0974 SHIFT SOLENOID "A" CONTROL CIRCUIT HIGH.
P0976	SHIFT SOLENOID "B" CONTROL CIRCUIT LOW	Primary DOWN solenoid is faulty or output signal circuit is shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0976 SHIFT SOLENOID "B" CONTROL CIRCUIT LOW.
P0977	SHIFT SOLENOID "B" CONTROL CIRCUIT HIGH	Primary DOWN solenoid is faulty or output signal circuit is open or shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0977 SHIFT SOLENOID "B" CONTROL CIRCUIT HIGH.
P160A	RANDOM ACCESS MEMORY (RAM) ERROR	TCM RAM malfunction	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P160A RANDOM ACCESS MEMORY (RAM) ERROR.
P170A	L-RANGE SWITCH	L range switch is faulty or input signal circuit is open or shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P170A L-RANGE SWITCH.
P2530	IGNITION SWITCH RUN POSITION CIRCUIT	Ignition SW circuit is faulty.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2530 IGNITION SWITCH RUN POSITION CIRCUIT.
P2746	INTERMEDIATE SHAFT SPEED SENSOR "B" CIRCUIT RANGE/PERFORMANCE	Primary speed sensor is faulty or input signal circuit is open or shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2746 INTERMEDIATE SHAFT SPEED SENSOR "B" CIRCUIT RANGE/PERFORMANCE.
P2747	INTERMEDIATE SHAFT SPEED	Primary speed sensor signal no input	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic

	SENSOR "B" CIRCUIT NO SIGNAL		Procedure with Diagnostic Trouble Code (DTC)>DTC P2747 INTERMEDIATE SHAFT SPEED SENSOR "B" CIRCUIT NO SIGNAL.
P2750	INTERMEDIATE SHAFT SPEED SENSOR "C" CIRCUIT RANGE/PERFORMA NCE	Secondary speed sensor is faulty or input signal circuit is open or shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2750 INTERMEDIATE SHAFT SPEED SENSOR "C" CIRCUIT RANGE/PERFORMANCE.
P2751	INTERMEDIATE SHAFT SPEED SENSOR "C" CIRCUIT NO SIGNAL	Secondary speed sensor signal no input	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2751 INTERMEDIATE SHAFT SPEED SENSOR "C" CIRCUIT NO SIGNAL.
P2757	TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT PERFORMANCE/STU CK OFF	Lock-up duty solenoid is faulty, hydraulic circuit is stuck in low pressure side.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2757 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT PERFORMANCE/STUCK OFF.
P2758	TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT STUCK ON	Lock-up duty solenoid is faulty, hydraulic circuit is stuck in high pressure side.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2758 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT STUCK ON.
P2763	TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT HIGH	Lock-up duty solenoid is faulty or output signal circuit is open or shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2763 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT HIGH.
P2764	TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID	Lock-up duty solenoid is faulty, or output signal circuit is shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2764 TORQUE CONVERTER CLUTCH PRESSURE

	CONTROL CIRCUIT LOW		CONTROL SOLENOID CONTROL CIRCUIT LOW.
P2769	TORQUE CONVERTER CLUTCH CIRCUIT LOW	Lock-up ON/OFF solenoid is faulty or output signal circuit is shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2769 TORQUE CONVERTER CLUTCH CIRCUIT LOW.
P2770	TORQUE CONVERTER CLUTCH CIRCUIT HIGH	Lock-up ON/OFF solenoid is faulty or output signal circuit is open or shorted.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2770 TORQUE CONVERTER CLUTCH CIRCUIT HIGH.
U0073	CAN FAILURE, BUS 'OFF' DETECTION	CAN bus is shorted or communication error.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	Detected that the engine data has not yet arrived.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Detected that the VDC data has not yet arrived.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	Detected that the body integrated unit data has not yet arrived.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Detected that the meter data has not yet arrived.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0164	LOST COMMUNICATION	Detected that the air conditioner data has not yet arrived.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble


	WITH HVAC CONTROL MODULE		Code (DTC)>DTC U0164 LOST COMMUNICATION WITH HVAC CONTROL MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	Detected abnormality of the engine data.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	Detected abnormality of the VDC data.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE	Detected abnormality of the body integrated unit data.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE.
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	Detected abnormality of the meter data.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.
U0424	INVALID DATA RECEIVED FROM HVAC CONTROL MODULE	Detected abnormality of the air conditioner data.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0424 INVALID DATA RECEIVED FROM HVAC CONTROL MODULE.
U1235	LOST COMMUNICATION WITH EyeSight	Detected that the EyeSight data has not yet arrived.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1235 LOST COMMUNICATION WITH EyeSight.
U1433	INVALID DATA RECEIVED FROM EyeSight	Detected abnormality of the EyeSight data.	 Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1433 INVALID DATA RECEIVED FROM EyeSight.

TRANSMISSION (DIAGNOSTICS) > Read Diagnostic Trouble Code (DTC)

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Transmission].
5. On [Select Function] display, select [DTC].

Note:

- For details concerning the DTC, refer to “List of Diagnostic Trouble Code (DTC)”.
 [Ref. to TRANSMISSION \(DIAGNOSTICS\)>List of Diagnostic Trouble Code \(DTC\).](#)
- For detailed operation procedures, refer to “Application help”.

TRANSMISSION (DIAGNOSTICS) > Subaru Select Monitor

OPERATION

1. HOW TO USE SUBARU SELECT MONITOR

For detailed operation procedures, refer to "Application help".

2. DATA MONITOR

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Transmission].
5. On [Select Function] display, select [Data monitor].

- Non-turbo model

Display	Content	Unit of measure
Engine Speed	Rotation speed signal transmitted from the ECM. Calculated from crankshaft position sensor signal. TCM input value.	rpm
Turbine Revolution Speed	Turbine rotation speed calculated by the TCM using signals from the turbine speed sensor.	rpm
Accel. Opening Angle	Accelerator pedal opening angle transmitted from the ECM. Value calculated from the accelerator pedal position sensor output. TCM input value.	%
Front Wheel Speed	Front wheel speed calculated from the secondary axis rotation speed.	km/h or MPH
ATF Temp.	Value calculated from the ATF temperature sensor output value. ATF temperature of the control valve section.	°C or °F
Lock Up Duty Ratio	Lock-up duty solenoid control duty ratio. TCM output value.	%
Transfer Duty Ratio	Transfer duty solenoid control duty ratio. TCM output value.	%
Actual Gear Ratio	Current gear ratio (rotation ratio of the pulley) calculated from the primary pulley axis rotation speed and the secondary pulley axis rotation speed.	—
Primary Rev Speed	Primary pulley rotation speed calculated by the TCM using signals from the primary speed sensor.	rpm
Secondary Rev Speed	Secondary pulley rotation speed calculated by the TCM using signals from the secondary speed sensor.	rpm
Stop Light Switch	Stop light SW signal. Set to ON when the brake pedal is depressed. TCM input value.	ON or OFF
Secondary Set Current	Value of the indicator current for controlling the secondary solenoid calculated by the TCM.	mA
Secondary Actual	Actual current value of the secondary solenoid. TCM	mA

Current	output value.	
Commanded Forward & Reverse Linear Solenoid Current	Value of the indicator current for controlling the F&R linear solenoid calculated by the TCM.	mA
Actual Forward & Reverse Linear Solenoid Current	Actual current value of the F&R linear solenoid. TCM output value.	mA
Control module voltage	Battery voltage. TCM input value.	V
Primary UP Duty	Primary UP solenoid control duty ratio. TCM output value.	%
Primary DOWN Duty	Primary DOWN solenoid control duty ratio. TCM output value.	%
P Range	Inhibitor SW signal. Set to ON when the select lever is in P range. TCM input value.	ON or OFF
R Range Signal	Inhibitor SW signal. Set to ON when the select lever is in R range. TCM input value.	ON or OFF
N Range	Inhibitor SW signal. Set to ON when the select lever is in N range. TCM input value.	ON or OFF
D Range Signal	Inhibitor SW signal. Set to ON when the select lever is in D range. TCM input value.	ON or OFF
L Range	L range signal. Set to ON when the select lever is in the L range gate. TCM input value.	ON or OFF
X Mode	ON/OFF status of the X mode received from the engine. TCM input value.	ON or OFF
Shift step in Manu. mode	Gear shift position in manual mode or in multi-stage shifting mode. TCM output value.	—
Manual Mode Switch	Manual mode SW signal. Set to ON when the select lever is in the manual shift gate. TCM input value.	ON or OFF
Up Switch	Status of the paddle shift up SW. Set to ON when the plus (+) side of the steering wheel paddle shift is pulled. TCM input value.	ON or OFF
Down Switch	Status of the paddle shift down SW. Set to ON when the minus (–) side of the steering wheel paddle shift is pulled. TCM input value.	ON or OFF
secondary pressure sensor voltage.	Voltage value after an analog/digital conversion is done inside the TCM using the signal input from the secondary pressure sensor. TCM input value.	V
ATF Temp sensor voltage.	Sensor voltage value input from the ATF temperature sensor to the TCM. TCM input value.	V
Diagnosis Lamp	Transmission failure detection status. Set to ON when a failure is detected. AT oil temperature warning light blinks at 2 Hz. TCM output value.	ON or OFF
ATF Temperature Lamp	ATF high temperature detection status. Set to ON when high temperature is detected. ATF temperature	ON or OFF

	warning light illuminates. TCM output value.	
AT learning	AT initial learning completion status. AT oil temperature warning light blinks at 4 Hz when the learning is not completed. TCM output value.	Complete or incomplete
Trip Count	Number of times the ignition switch is turned ON since the vehicle was manufactured.	Time
Count	Shows whether the elapsed time counter after turning ON the ignition switch is synchronized with the integrated unit (master unit) or an original counter. "Common" means the integrated unit, and "Originally" means that the original counter is used.	—
Time Count	Shows the elapsed time after turning ON the ignition switch.	ms
Actual Secondary Pressure	Pressure value applied to the secondary pulley cylinder (equal to line pressure) detected by the secondary pressure sensor	MPa
System Voltage	Power supply voltage supplied to the backup power supply (\approx battery voltage).	V

- Turbo model

Display	Content	Unit of measure
Engine Speed	Rotation speed signal transmitted from the ECM. Calculated from crankshaft position sensor signal. TCM input value.	rpm
Turbine Revolution Speed	Turbine rotation speed which is based on the primary pulley rotation speed calculated by the TCM using signals from the primary speed sensor, and is accelerated by the reduction gear ratio.	rpm
Accel. Opening Angle	Accelerator pedal opening angle transmitted from the ECM. Value calculated from the accelerator pedal position sensor output. TCM input value.	%
Front Wheel Speed	Front wheel speed calculated from the forward/reverse clutch output axis rotation speed.	km/h or MPH
ATF Temp.	Value calculated from the ATF temperature sensor output value. ATF temperature of the oil pan section.	°C or °F
Lock Up Duty Ratio	Lock-up duty solenoid control duty ratio. TCM output value.	%
Lock-Up ON/OFF Solenoid	Lock-up ON/OFF solenoid drive signal. Set to ON at a lockup condition. TCM output value.	ON or OFF
Transfer Duty Ratio	Transfer duty solenoid control duty ratio. TCM output value.	%
Actual Gear Ratio	Current gear ratio (rotation ratio of the pulley) calculated from the primary pulley axis rotation speed and the secondary pulley axis rotation speed.	—
Primary Rev Speed	Primary pulley rotation speed calculated by the TCM	rpm

	using signals from the primary speed sensor.	
Secondary Rev Speed	Secondary pulley rotation speed calculated by the TCM using signals from the secondary speed sensor.	rpm
Front Wheel Speed	Front wheel rotation speed calculated from the forward/reverse clutch output axis rotation speed.	rpm
Stop Light Switch	Stop light SW signal. Set to ON when the brake pedal is depressed. TCM input value.	ON or OFF
Secondary Set Current	Value of the indicator current for controlling the secondary solenoid calculated by the TCM.	mA
Secondary Actual Current	Actual current value of the secondary solenoid. TCM output value.	mA
Commanded Forward & Reverse Linear Solenoid Current	Value of the indicator current for controlling the F&R linear solenoid calculated by the TCM.	mA
Actual Forward & Reverse Linear Solenoid Current	Actual current value of the F&R linear solenoid. TCM output value.	mA
Control module voltage	Battery voltage. TCM input value.	V
Primary UP Duty	Primary UP solenoid control duty ratio. TCM output value.	%
Primary DOWN Duty	Primary DOWN solenoid control duty ratio. TCM output value.	%
P Range	Inhibitor SW signal. Set to ON when the select lever is in P range. TCM input value.	ON or OFF
R Range Signal	Inhibitor SW signal. Set to ON when the select lever is in R range. TCM input value.	ON or OFF
N Range	Inhibitor SW signal. Set to ON when the select lever is in N range. TCM input value.	ON or OFF
D Range Signal	Inhibitor SW signal. Set to ON when the select lever is in D range. TCM input value.	ON or OFF
SI Drive mode(Display)	Currently selected SI-DRIVE mode, which is transmitted from meter. Determined by the SI-DRIVE SW operation. TCM input value.	I, S or S#
SI Drive mode(Control)	Current SI-DRIVE mode in ECM control, which is transmitted from the ECM. Determined by adjusting the mode determined by the SI-DRIVE SW operation inside the ECM. TCM input value.	I, S or S#
X Mode	ON/OFF status of the X mode received from the engine. TCM input value.	ON or OFF
Shift step in Manu. mode	Gear shift position in manual mode or in multi-stage shifting mode. TCM output value.	—
Manual Mode Switch	Manual mode SW signal. Set to ON when the select lever is in the manual shift gate. TCM input value.	ON or OFF
Up Switch	Status of the paddle shift up SW. Set to ON when	ON or OFF

	the plus (+) side of the steering wheel paddle shift is pulled. TCM input value.	
Down Switch	Status of the paddle shift down SW. Set to ON when the minus (–) side of the steering wheel paddle shift is pulled. TCM input value.	ON or OFF
secondary pressure sensor voltage.	Voltage value after an analog/digital conversion is done inside the TCM using the signal input from the secondary pressure sensor. TCM input value.	V
ATF Temp sensor voltage.	Sensor voltage value input from the ATF temperature sensor to the TCM. TCM input value.	V
Diagnosis Lamp	Transmission failure detection status. Set to ON when a failure is detected. AT oil temperature warning light blinks at 2 Hz. TCM output value.	ON or OFF
ATF Temperature Lamp	ATF high temperature detection status. Set to ON when high temperature is detected. ATF temperature warning light illuminates. TCM output value.	ON or OFF
AT learning	AT initial learning completion status. AT oil temperature warning light blinks at 4 Hz when the learning is not completed. TCM output value.	Complete or incomplete
Trip Count	Number of times the ignition switch is turned ON since the vehicle was manufactured.	Time
Count	Shows whether the elapsed time counter after turning ON the ignition switch is synchronized with the integrated unit (master unit) or an original counter. "Common" means the integrated unit, and "Originally" means that the original counter is used.	–
Time Count	Shows the elapsed time after turning ON the ignition switch.	ms
Actual Secondary Pressure	Pressure value applied to the secondary pulley cylinder (equal to line pressure) detected by the secondary pressure sensor	MPa
System Voltage	Power supply voltage supplied to the backup power supply (\approx battery voltage).	V

Note:

For detailed operation procedures, refer to "Application help".

3. FREEZE FRAME DATA

1. On [Start] display, select [Diagnosis].
 2. On [Vehicle selection] display, enter vehicle information and select [OK].
 3. On [Main Menu] display, select [Each System].
 4. On [Select System] display, select [Transmission].
 5. On [Select Function] display, select [DTC].
 6. On [DTC] display, select [FFD].
- Non-turbo model

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Display	Content	Unit of measure
Engine Speed	Rotation speed signal transmitted from the ECM. Calculated from crankshaft position sensor signal. TCM input value.	rpm
Turbine Revolution Speed	Turbine rotation speed calculated by the TCM using signals from the turbine speed sensor.	rpm
Accel. Opening Angle	Accelerator pedal opening angle transmitted from the ECM. Value calculated from the accelerator pedal position sensor output. TCM input value.	%
Front Wheel Speed	Front wheel speed calculated from the secondary axis rotation speed.	km/h or MPH
ATF Temp.	Value calculated from the ATF temperature sensor output value. ATF temperature of the control valve section.	°C or °F
Lock Up Duty Ratio	Lock-up duty solenoid control duty ratio. TCM output value.	%
Transfer Duty Ratio	Transfer duty solenoid control duty ratio. TCM output value.	%
Actual Gear Ratio	Current gear ratio (rotation ratio of the pulley) calculated from the primary pulley axis rotation speed and the secondary pulley axis rotation speed.	—
Primary Rev Speed	Primary pulley rotation speed calculated by the TCM using signals from the primary speed sensor.	rpm
Secondary Rev Speed	Secondary pulley rotation speed calculated by the TCM using signals from the secondary speed sensor.	rpm
Stop Light Switch	Stop light SW signal. Set to ON when the brake pedal is depressed. TCM input value.	ON or OFF
Secondary Set Current	Value of the indicator current for controlling the secondary solenoid calculated by the TCM.	mA
Secondary Actual Current	Actual current value of the secondary solenoid. TCM output value.	mA
Commanded Forward & Reverse Linear Solenoid Current	Value of the indicator current for controlling the F&R linear solenoid calculated by the TCM.	mA
Actual Forward & Reverse Linear Solenoid Current	Actual current value of the F&R linear solenoid. TCM output value.	mA
Control module voltage	Battery voltage. TCM input value.	V
Primary UP Duty	Primary UP solenoid control duty ratio. TCM output value.	%
Primary DOWN Duty	Primary DOWN solenoid control duty ratio. TCM output value.	%
P Range	Inhibitor SW signal. Set to ON when the select lever is in P range. TCM input value.	ON or OFF

R Range Signal	Inhibitor SW signal. Set to ON when the select lever is in R range. TCM input value.	ON or OFF
N Range	Inhibitor SW signal. Set to ON when the select lever is in N range. TCM input value.	ON or OFF
D Range Signal	Inhibitor SW signal. Set to ON when the select lever is in D range. TCM input value.	ON or OFF
L Range	L range signal. Set to ON when the select lever is in the L range gate. TCM input value.	ON or OFF
Shift step in Manu. mode	Gear shift position in manual mode or in multi-stage shifting mode. TCM output value.	—
Manual Mode Switch	Manual mode SW signal. Set to ON when the select lever is in the manual shift gate. TCM input value.	ON or OFF
Up Switch	Status of the paddle shift up SW. Set to ON when the plus (+) side of the steering wheel paddle shift is pulled. TCM input value.	ON or OFF
Down Switch	Status of the paddle shift down SW. Set to ON when the minus (–) side of the steering wheel paddle shift is pulled. TCM input value.	ON or OFF
secondary pressure sensor voltage.	Voltage value after an analog/digital conversion is done inside the TCM using the signal input from the secondary pressure sensor. TCM input value.	V
ATF Temp sensor voltage.	Sensor voltage value input from the ATF temperature sensor to the TCM. TCM input value.	V
Diagnosis Lamp	Transmission failure detection status. Set to ON when a failure is detected. AT oil temperature warning light blinks at 2 Hz. TCM output value.	ON or OFF
ATF Temperature Lamp	ATF high temperature detection status. Set to ON when high temperature is detected. ATF temperature warning light illuminates. TCM output value.	ON or OFF
Trip Count	Number of times the ignition switch is turned ON since the vehicle was manufactured.	Time
Count	Shows whether the elapsed time counter after turning ON the ignition switch is synchronized with the integrated unit (master unit) or an original counter. "Common" means the integrated unit, and "Originally" means that the original counter is used.	—
Time Count	Shows the elapsed time after turning ON the ignition switch.	ms
Actual Secondary Pressure	Pressure value applied to the secondary pulley cylinder (equal to line pressure) detected by the secondary pressure sensor	MPa
System Voltage	Power supply voltage supplied to the backup power supply (\approx battery voltage).	V

• Turbo model

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Display	Content	Unit of measure
Engine Speed	Rotation speed signal transmitted from the ECM. Calculated from crankshaft position sensor signal. TCM input value.	rpm
Turbine Revolution Speed	Turbine rotation speed which is based on the primary pulley rotation speed calculated by the TCM using signals from the primary speed sensor, and is accelerated by the reduction gear ratio.	rpm
Accel. Opening Angle	Accelerator pedal opening angle transmitted from the ECM. Value calculated from the accelerator pedal position sensor output. TCM input value.	%
Front Wheel Speed	Front wheel speed calculated from the forward/reverse clutch output axis rotation speed.	km/h or MPH
ATF Temp.	Value calculated from the ATF temperature sensor output value. ATF temperature of the oil pan section.	°C or °F
Lock Up Duty Ratio	Lock-up duty solenoid control duty ratio. TCM output value.	%
Lock-Up ON/OFF Solenoid	Lock-up ON/OFF solenoid drive signal. Set to ON at a lockup condition. TCM output value.	ON or OFF
Transfer Duty Ratio	Transfer duty solenoid control duty ratio. TCM output value.	%
Actual Gear Ratio	Current gear ratio (rotation ratio of the pulley) calculated from the primary pulley axis rotation speed and the secondary pulley axis rotation speed.	—
Primary Rev Speed	Primary pulley rotation speed calculated by the TCM using signals from the primary speed sensor.	rpm
Secondary Rev Speed	Secondary pulley rotation speed calculated by the TCM using signals from the secondary speed sensor.	rpm
Front Wheel Speed	Front wheel rotation speed calculated from the forward/reverse clutch output axis rotation speed.	rpm
Stop Light Switch	Stop light SW signal. Set to ON when the brake pedal is depressed. TCM input value.	ON or OFF
Secondary Set Current	Value of the indicator current for controlling the secondary solenoid calculated by the TCM.	mA
Secondary Actual Current	Actual current value of the secondary solenoid. TCM output value.	mA
Commanded Forward & Reverse Linear Solenoid Current	Value of the indicator current for controlling the F&R linear solenoid calculated by the TCM.	mA
Actual Forward & Reverse Linear Solenoid Current	Actual current value of the F&R linear solenoid. TCM output value.	mA
Control module voltage	Battery voltage. TCM input value.	V
Primary UP Duty	Primary UP solenoid control duty ratio. TCM output	%

	value.	
Primary DOWN Duty	Primary DOWN solenoid control duty ratio. TCM output value.	%
P Range	Inhibitor SW signal. Set to ON when the select lever is in P range. TCM input value.	ON or OFF
R Range Signal	Inhibitor SW signal. Set to ON when the select lever is in R range. TCM input value.	ON or OFF
N Range	Inhibitor SW signal. Set to ON when the select lever is in N range. TCM input value.	ON or OFF
D Range Signal	Inhibitor SW signal. Set to ON when the select lever is in D range. TCM input value.	ON or OFF
SI Drive mode(Display)	Currently selected SI-DRIVE mode, which is transmitted from meter. Determined by the SI-DRIVE SW operation. TCM input value.	I, S or S#
SI Drive mode(Control)	Current SI-DRIVE mode in ECM control, which is transmitted from the ECM. Determined by adjusting the mode determined by the SI-DRIVE SW operation inside the ECM. TCM input value.	I, S or S#
Shift step in Manu. mode	Gear shift position in manual mode or in multi-stage shifting mode. TCM output value.	—
Manual Mode Switch	Manual mode SW signal. Set to ON when the select lever is in the manual shift gate. TCM input value.	ON or OFF
Up Switch	Status of the paddle shift up SW. Set to ON when the plus (+) side of the steering wheel paddle shift is pulled. TCM input value.	ON or OFF
Down Switch	Status of the paddle shift down SW. Set to ON when the minus (–) side of the steering wheel paddle shift is pulled. TCM input value.	ON or OFF
secondary pressure sensor voltage.	Voltage value after an analog/digital conversion is done inside the TCM using the signal input from the secondary pressure sensor. TCM input value.	V
ATF Temp sensor voltage.	Sensor voltage value input from the ATF temperature sensor to the TCM. TCM input value.	V
Diagnosis Lamp	Transmission failure detection status. Set to ON when a failure is detected. AT oil temperature warning light blinks at 2 Hz. TCM output value.	ON or OFF
ATF Temperature Lamp	ATF high temperature detection status. Set to ON when high temperature is detected. ATF temperature warning light illuminates. TCM output value.	ON or OFF
Trip Count	Number of times the ignition switch is turned ON since the vehicle was manufactured.	Time
Count	Shows whether the elapsed time counter after turning ON the ignition switch is synchronized with the integrated unit (master unit) or an original	—

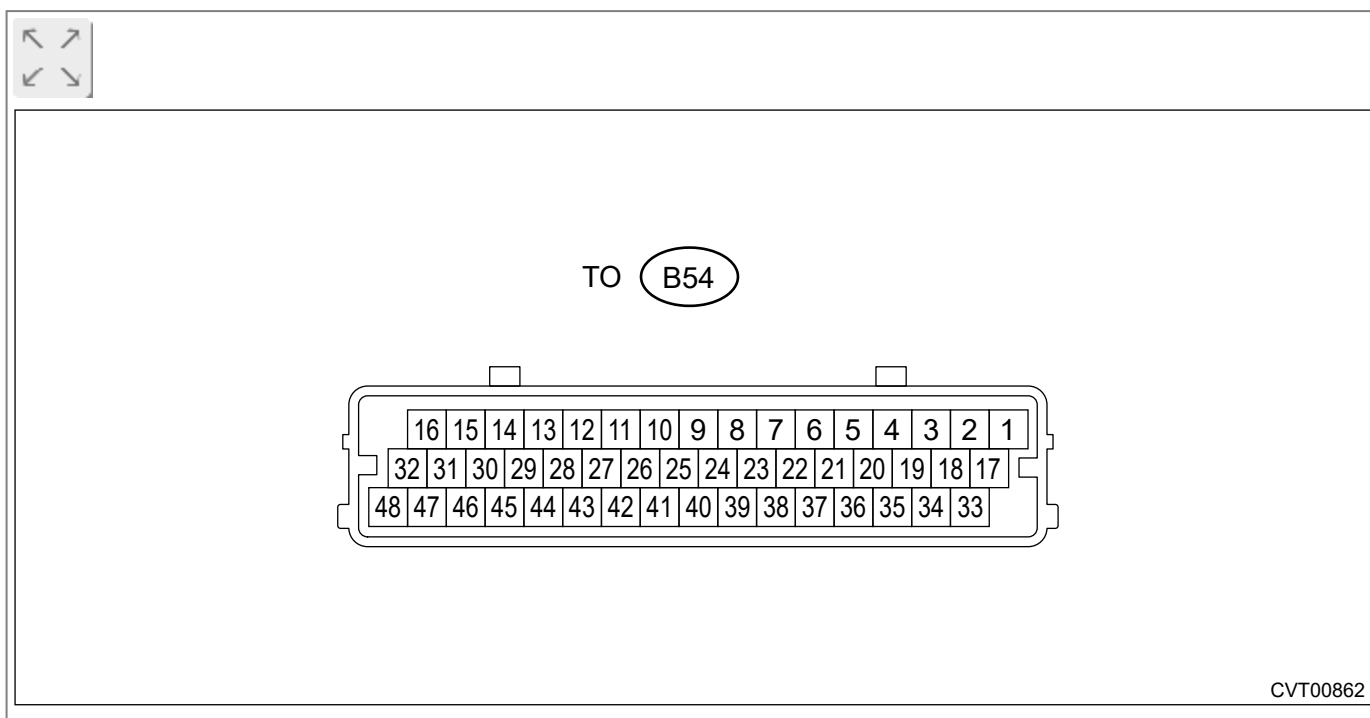
	counter. "Common" means the integrated unit, and "Originally" means that the original counter is used.	
Time Count	Shows the elapsed time after turning ON the ignition switch.	ms
Actual Secondary Pressure	Pressure value applied to the secondary pulley cylinder (equal to line pressure) detected by the secondary pressure sensor	MPa
System Voltage	Power supply voltage supplied to the backup power supply (\approx battery voltage).	V

Note:

For detailed operation procedures, refer to "Application help".

TRANSMISSION (DIAGNOSTICS) > Transmission Control Module (TCM) I/O Signal

ELECTRICAL SPECIFICATION



Note:

Measure after warming up.

- Non-turbo model

Item	Terminal No.	Measuring condition	Measurement value	Resistance between terminal and chassis ground	Remarks
Backup power supply	34	—	10 — 13 V	—	
Ignition power supply	41	—	10 — 13 V	—	
Main power supply	8	—	10 — 13 V	—	
Main power supply	24	—	10 — 13 V	—	
Main power supply	40	—	10 — 13 V	—	
Manual mode switch/ Lo mode switch	20	Manual mode switch/ Lo mode switch ON	Less than 1 V	—	
		Manual mode switch/ Lo mode switch OFF	8 V or more	—	
Manual mode UP switch	19	Manual mode UP switch ON	Less than 1 V	—	
		Manual mode UP switch	8 V or more	—	

		OFF			
Manual mode DOWN switch	18	Manual mode DOWN switch ON	Less than 1 V	—	
		Manual mode DOWN switch OFF	8 V or more	—	
Stop light switch	29	Stop light switch ON	8 V or more	—	
		Stop light switch OFF	Less than 1 V	—	
P range switch	38	P range	Less than 1 V	—	
		Except for P range	8 V or more	—	
R range switch	37	R range	Less than 1 V	—	
		Except for R range	8 V or more	—	
N range switch	36	N range	Less than 1 V	—	
		Except for N range	8 V or more	—	
D range switch	35	D range	Less than 1 V	—	
		Except for D range	8 V or more	—	
ATF temperature sensor	6	ATF temperature at 20°C (68°F)	Approx. 2.5 V	Approx. 2.5 kΩ	
		ATF temperature at 80°C (176°F)	Approx. 0.7 V	Approx. 330 Ω	
ATF temperature sensor GND	1	Always	Approx. 0 V	—	
Secondary pressure sensor power supply output	33	Ignition switch ON	5 V	—	
Secondary pressure sensor	5	Ignition switch ON, engine OFF	Approx. 0.5 V (0 MPa)	—	Value increases with increase of engine load. (0.5 — 4.5 V)
		Ignition switch ON, engine ON	Approx. 1.0 V (1.0 MPa)	—	
Secondary pressure sensor GND	2	Always	Approx. 0 V	—	
Primary speed sensor	14	While driving	0 or 5 V	—	Refer to the waveform (sensor)
Secondary speed sensor	13	While driving	0 or 5 V	—	Refer to the waveform (sensor)
Turbine speed sensor	12	Engine ON, P or N range	0 or 5 V	—	Refer to the waveform (sensor)
Self shut output	25	For three seconds after ignition switch ON and OFF	Less than 1 V	—	

		Ignition switch OFF	8 V or more		
F&R solenoid	16	Engine ON	Refer to the waveform (solenoid (1))	Approx. 4 – 6 Ω	Resistance value at 20°C (68°F). Value is higher as the temperature increase.
Secondary solenoid	32	Engine ON	Refer to the waveform (solenoid (2))	Approx. 5 – 7 Ω	Resistance value at 20°C (68°F). Value is higher as the temperature increase.
Primary UP solenoid	47	Engine ON, while UP shifting	Refer to the waveform (solenoid (3))	Approx. 10 – 13.5 Ω	Resistance value at 20°C (68°F). Value is higher as the temperature increase.
Primary DOWN solenoid	30	Engine ON, while DOWN shifting	Refer to the waveform (solenoid (4))	Approx. 10 – 13.5 Ω	Resistance value at 20°C (68°F). Value is higher as the temperature increase.
Lock-up duty solenoid	15	Lock-up ON	Refer to the waveform (solenoid (5))	Approx. 10 – 13.5 Ω	Resistance value at 20°C (68°F). Value is higher as the temperature increase.
AWD solenoid	48	Engine ON, P or N range	Refer to the waveform (solenoid (6))	Approx. 2 – 4.5 Ω	Resistance value at 20°C (68°F). Value is higher as the temperature increase.
		Engine ON, D range, and brake ON	Refer to the waveform (solenoid (7))		
CAN communication line (+)	43	—	—	—	
CAN communication line (–)	44	—	—	—	
GND	26	Always	Approx. 0 V	—	
GND	42	Always	Approx. 0 V	—	

• Turbo model

Item	Terminal No.	Measuring condition	Measurement value	Resistance between terminal and chassis ground	Remarks
Backup power supply	34	—	10 — 13 V	—	
Ignition power supply	41	—	10 — 13 V	—	
Main power supply	8	—	10 — 13 V	—	
Main power supply	24	—	10 — 13 V	—	
Main power supply	40	—	10 — 13 V	—	
Manual mode switch/ Lo mode switch	20	Manual mode switch/ Lo mode switch ON	Less than 1 V	—	
		Manual mode switch/ Lo mode switch OFF	8 V or more	—	
Manual mode UP switch	19	Manual mode UP switch ON	Less than 1 V	—	
		Manual mode UP switch OFF	8 V or more	—	
Manual mode DOWN switch	18	Manual mode DOWN switch ON	Less than 1 V	—	
		Manual mode DOWN switch OFF	8 V or more	—	
Stop light switch	29	Stop light switch ON	8 V or more	—	
		Stop light switch OFF	Less than 1 V	—	
P range switch	38	P range	Less than 1 V	—	
		Except for P range	8 V or more	—	
R range switch	37	R range	Less than 1 V	—	
		Except for R range	8 V or more	—	
N range switch	36	N range	Less than 1 V	—	
		Except for N range	8 V or more	—	
D range switch	35	D range	Less than 1 V	—	
		Except for D range	8 V or more	—	
ATF temperature sensor	6	ATF temperature at 20°C (68°F)	Approx. 2.6 V	Approx. 2.6 kΩ	
		ATF temperature at 80°C (176°F)	Approx. 0.7 V	Approx. 370 Ω	
ATF temperature sensor GND	1	Always	Approx. 0 V	—	

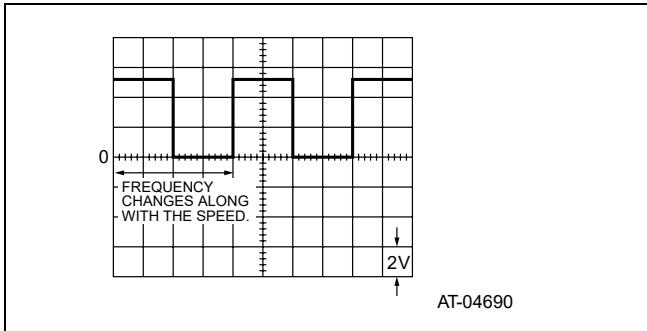
Secondary pressure sensor power supply output	33	Ignition switch ON	5 V	—	
Secondary pressure sensor	5	Ignition switch ON, engine OFF	Approx. 0.5 V (0 MPa)	—	Value increases with increase of engine load. (0.5 — 4.5 V)
		Ignition switch ON, engine ON	Approx. 1.0 V (1.0 MPa)	—	
Secondary pressure sensor GND	2	Always	Approx. 0 V	—	
Primary speed sensor	14	While driving	0 or 5 V	—	Refer to the waveform (sensor)
Secondary speed sensor	13	While driving	0 or 5 V	—	Refer to the waveform (sensor)
Front wheel speed sensor	12	While driving	0 or 5 V	—	Refer to the waveform (sensor)
Self shut output	25	For three seconds after ignition switch ON and OFF	Less than 1 V	—	
		Ignition switch OFF	8 V or more		
F&R solenoid	16	Engine ON	Refer to the waveform (solenoid (1))	Approx. 4 — 6 Ω	Resistance value at 20°C (68°F). Value is higher as the temperature increase.
Secondary solenoid	32	Engine ON	Refer to the waveform (solenoid (2))	Approx. 5 — 7 Ω	Resistance value at 20°C (68°F). Value is higher as the temperature increase.
Primary UP solenoid	47	Engine ON, while UP shifting	Refer to the waveform (solenoid (3))	Approx. 10 — 13.5 Ω	Resistance value at 20°C (68°F). Value is higher as the temperature increase.
Primary DOWN solenoid	30	Engine ON, while DOWN shifting	Refer to the waveform (solenoid (4))	Approx. 10 — 13.5 Ω	Resistance value at 20°C (68°F). Value is higher as the

					temperature increase.
Lock-up duty solenoid	15	Lock-up ON	Refer to the waveform (solenoid (5))	Approx. 10 – 13.5 Ω	Resistance value at 20°C (68°F). Value is higher as the temperature increase.
AWD solenoid	48	Engine ON, P or N range	Refer to the waveform (solenoid (6))	Approx. 2 – 4.5 Ω	Resistance value at 20°C (68°F). Value is higher as the temperature increase.
		Engine ON, D range, and brake ON	Refer to the waveform (solenoid (7))		
Lock-up ON/OFF solenoid	31	Lock-up OFF	Less than 1 V	Approx. 13 – 18.5 Ω	Resistance value at 20°C (68°F). Value is higher as the temperature increase.
		With lock-up ON and R range	Battery voltage or higher		
CAN communication line (+)	43	—	—	—	
CAN communication line (–)	44	—	—	—	
GND	26	Always	Approx. 0 V	—	
GND	42	Always	Approx. 0 V	—	

TRANSMISSION (DIAGNOSTICS) > Transmission Control Module (TCM) I/O Signal

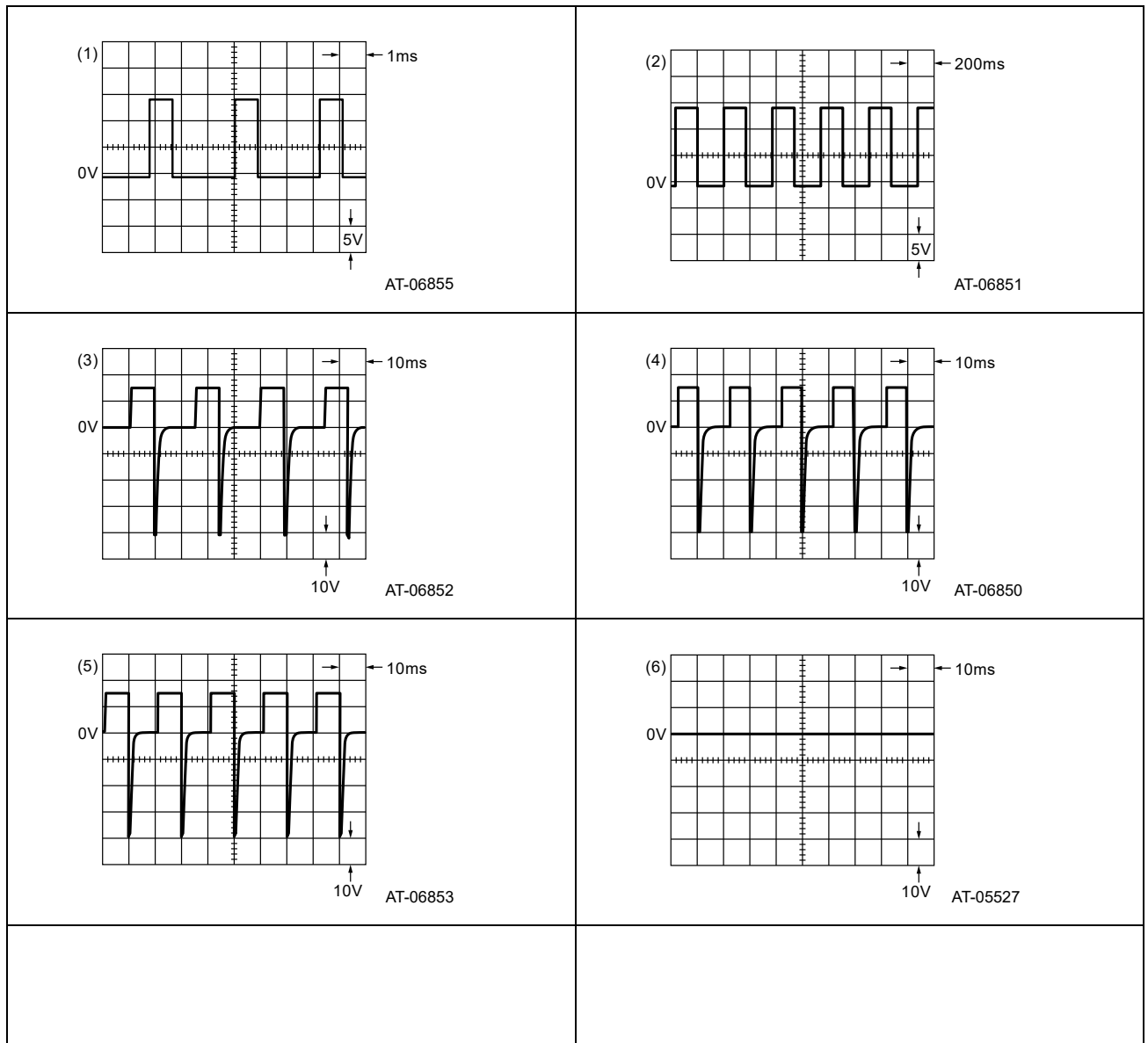
WAVEFORM

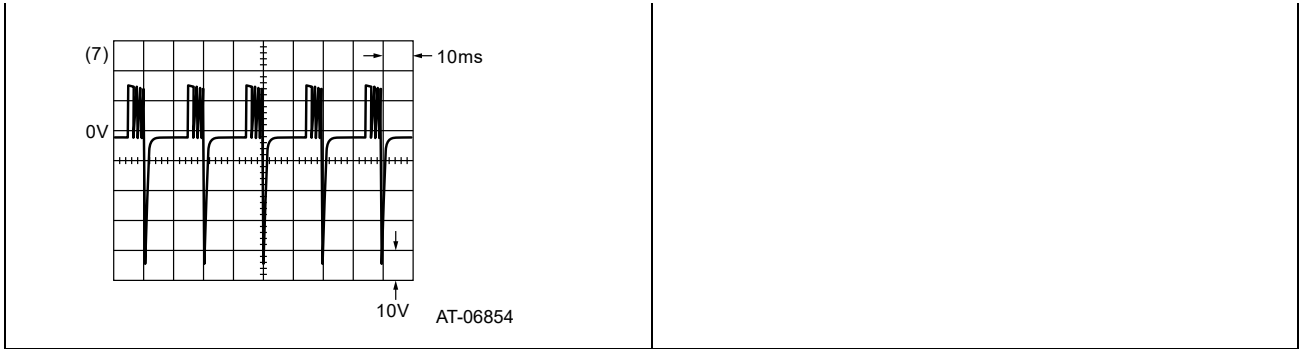
1. SENSOR



2. SOLENOID

- Non-turbo model





• Turbo model

